

ACADEMIC VOCABULARY AND LEXICAL BUNDLES IN THE WRITING
OF UNDERGRADUATE PSYCHOLOGY STUDENTS

by

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submitted in accordance with the requirements
for the degree of

DOCTOR OF LITERATURE AND PHILOSOPHY

in the subject

LINGUISTICS

at the

UNIVERSITY OF SOUTH AFRICA

SUPERVISOR: PROF. E.H. HUBBARD

JUNE 2016

ABSTRACT

This thesis investigates the relationship which both academic vocabulary and lexical bundles have to academic performance at university. While academic vocabulary is defined in terms of the University Word List (Coxhead, 2000), lexical bundles are identified as groups of four words that commonly co-occur, such as *on the other hand* and *as a result of*. A corpus of student essay writing in a single discipline, psychology, was developed over the course of a three-year undergraduate degree. To provide a benchmark against which to compare the student academic writing, a corpus of published articles in the same discipline was developed. The VocabProfile program (Cobb, 2002) was used to establish the density of academic vocabulary in the student essays. Similarly, the density of lexical bundle use was analysed by means of WordSmith Tools (Scott, 2012). The densities were then correlated against students' academic performance as measured by their essay results. Comparisons were also made between the use of academic vocabulary and lexical bundles by first- and additional-language speakers, and by first- and third-year students. A keyness analysis enabled comparisons of academic vocabulary and bundle usage by high and low achievers.

An additional aspect of this study was the comparison of densities of academic vocabulary and lexical bundles found in the IELTS writing test and in student essays, and the correlation of IELTS reading and writing test scores to students' academic performance. The students' vocabulary knowledge was also tested by the application of receptive and productive vocabulary tests, and the results compared to their academic performance.

Results indicate that the 10 000-word level is a stronger predictor of academic performance than either the 5000-word level or academic vocabulary, and that there is a significant relationship between the density of lexical bundle use by students and their academic performance. Both vocabulary measures are therefore arguably better predictors of academic performance than the IELTS test scores.

Keywords

Corpus linguistics, academic vocabulary, lexical bundles, IELTS, student academic writing, longitudinal study, first language, additional language, academic performance, undergraduate students, psychology.

ACKNOWLEDGEMENTS

To the teams at Wits Language School who kept everything running like clockwork during my extended study periods.

For all the encouragement, support and help with some of the more technical aspects, special thanks go to Chris, Wendy, Jane, Sally, Anne, Lilli, Cate, Kitty, Michael, Danie and Byron – an invaluable network of associates.

In particular, my sincere thanks to my supervisor, Professor Hilton Hubbard, through whose insightful guidance and exceptionally generous allocation of time (and application of tea), the final product took shape.

DECLARATION

I declare that ACADEMIC VOCABULARY AND LEXICAL BUNDLES IN THE WRITING OF UNDERGRADUATE PSYCHOLOGY STUDENTS is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

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Chapter 1

Introduction

1.1 Introduction

Although the exact nature and extent of the variables which influence success at university are a matter for constant debate, the fact that language is key to performing well at tertiary level is no longer under dispute. The objective of much applied linguistic research has been to identify aspects of language that are particularly important in student writing and reading comprehension, to examine more closely the nature of these relationships, and how they might be used to best effect. One of the aspects identified has been the challenge presented when students' vocabulary knowledge appears not to be adequate to the demands of university study. The current study focuses primarily on two types of vocabulary found in academic writing: academic vocabulary and lexical bundles, specifically four-word sequences such as *on the other hand*, *as a result of* and *in the case of*. While academic vocabulary is inherent to academic texts, lexical bundles occur more broadly across spoken and written discourse. There are, however, a variety of bundles that have been identified as particularly common to academic writing (Biber, Johansson, Leech, Conrad and Finegan, 1999; Biber, Conrad and Cortes, 2004; Cortes, 2004; Hyland, 2008b). Competent use of these lexical bundles is regarded as one of the means by which students can manifest proficiency in an academic discipline (Biber and Barbieri, 2007; Cortes, 2006; Crossley and Salsbury, 2011; Hyland, 2008b).

The underlying aim of this study is to investigate the role of both academic vocabulary and lexical bundles in determining the academic performance of undergraduate students enrolled over three years for one of their major subjects, psychology. Although the study is limited to just one discipline, results showing a relationship between either type of vocabulary and academic performance could be of value in developing measures of students' potential performance, and thereby identifying students who would benefit from academic support. Rather than serving as a gatekeeping mechanism, such measures could be part of a screening process designed to assist first-year students whose linguistic skills are unlikely to enable a smooth transition from secondary school to university.

This chapter presents an overview of the study by examining the context in which it is situated, discussing the rationale for the research, setting out the research aims and questions, outlining the methodology used, and describing the overall structure of the thesis.

1.2 Context of the study

The University of the Witwatersrand (Wits) in Johannesburg recently introduced a new admissions policy which requires all international students for whom English is not a mother tongue to achieve a score of Band 7.0 or higher on the Cambridge IELTS test. This raises a number of questions, such as whether the IELTS test is a reliable predictor of academic success across all disciplines, and whether the kinds of lexico-grammatical features that tend to be elicited by the written component of IELTS correspond to those which typically occur in student academic writing.

Wits University is generally regarded as one of the more prestigious universities in South Africa, and so one that tends to attract students who have performed well above average on their National Senior Certificate (NSC) results. The NSC, otherwise known as the 'matriculation certificate', is the qualification obtained on successful completion of the final year of secondary school (Grade 12). Wits' admission requirements stipulate certain minimum scores on the NSC, with each faculty having a different set of requirements. For example, admission to the Faculty of Engineering and the Built Environment requires a higher average on the NSC than admission to the Faculty of Humanities. Candidates applying for acceptance to the Faculty of Health Sciences as well as those who qualify for mature age exemption (i.e. they wrote the matriculation certificate prior to the introduction of the NSC in 2008) are required to write the academic literacy and quantitative literacy sections of the National Benchmark Test (NBT)¹. The NBT is a screening or pre-admission test of university readiness that is designed to "reflect expectations for university students in first year programmes"².

While Wits University's student profile is not generally representative of the greater proportion of university students in South Africa, it is nevertheless important to situate this study in terms of the broader student population, and so to provide a brief overview of South Africa's current education situation. Following Nelson Mandela's release from prison in 1990, and the subsequent democratisation of education in terms of the South African Schools Act of 1996, there has been considerable pressure to redress the inequalities created by Apartheid. Within the tertiary education sector, this has meant increasing the number of students from formally

¹ <https://www.wits.ac.za/undergraduate/entry-requirements/selection-tests/>

² <https://www.wits.ac.za/media/wits-university/study/undergraduate/documents/NBT%20Brochure%202017.pdf>

disadvantaged groups who gain access to universities around the country. While access was traditionally granted on the basis of the matriculation results, it has been suggested that the current NSC pass rates have been modified in recent years to indicate a steady increase that is not an accurate reflection of students' actual academic standards (Jansen, 2003, in Stephen, Welman and Jordaan, 2004:43). As a result, Stephen et al. claim that a considerable proportion of academically under-prepared students have gained access to university. This claim ties in with the findings of the National Benchmark Test (NBT) project³ (2009) which indicated that over half the students enrolled for university courses at the time of the study were unlikely to succeed without varying degrees of intervention. On testing the levels of academic literacy and mathematics in approximately 13 000 students at universities around South Africa, it was found that less than half (46%) were proficient (obtaining over 65%), while a similar percentage were found to be at intermediate level (obtaining between 38 and 63%), and the remainder had only a basic level of proficiency (obtaining less than 37%).

The results of the NBT suggest that, while a considerable proportion of students who obtain a matric exemption, and so qualify for university entrance, are likely to have the academic literacy skills required for university, a similar proportion are not equipped with these skills, and are unlikely to be able to develop them independently, particularly in the case of those studying through English as an additional language. This claim is supported by Van Dyk and Weideman (2004b:1) who argue that "low academic language proficiency levels have been mooted as one of the primary causes of the lack of academic success experienced by many students at South African Universities". This position does not appear to have changed in recent years, as reflected in the opening statement of a South African article published in 2015:

Academic performance at universities in South Africa is a cause of concern. It is widely acknowledged that there are a variety of factors that contribute to poor academic performance, but language is regarded as one of the most important issues in this discussion.

(Van Rooy and Coetzee-Van Rooy, 2015:31.)

A typical consequence of poor language proficiency is poor academic performance as language proficiency is linked to a number of academic skills, such as those required for higher-level reading comprehension (Pretorius, 2000). This has implications for those first-year students at Wits who fall into the NBT 'intermediate' category as these students are generally at an academic disadvantage from the start of their undergraduate studies.

³ <http://www.nbt.ac.za/content/benchmark-levels>

Given the current concerns about academic performance, I would argue for the need to introduce more reliable university entrance criteria designed to identify first-year students whose language proficiency does not meet university requirements. This view corresponds to that of Van Rooy and Coetzee-Van Rooy (2015:43) who argue that universities should “devise and use their own ‘placement’ tests to identify students who would need additional support to be academically successful at university”. One of the immediate problems associated with such a proposal is the practicality of testing all university applicants. However, this challenge was addressed to some degree by the development of the Test of Academic Literacy levels (TALL). This placement test was developed at the University of Pretoria with the aim of assessing the language proficiency of more than 6000 students (Van Dyk and Weideman, 2004a). As the results determine whether or not students are required to enter the academic support programme, the test uses a multiple-choice format to ensure that the marks are released within 48 hours. It is based on a breakdown of abilities identified as necessary for academic literacy, including the ability to understand a range of academic vocabulary in context, to interpret and use metaphor and idiom, to perceive connotation, word play and ambiguity, and to understand the relations between different parts of a text (Van Dyk and Weideman, 2004a:16-17).

Within the framework of vocabulary research, measures of vocabulary such as Nation’s Vocabulary Levels Test (1990) are frequently used as placement tests to identify students who require academic support. However, while positive correlations between general vocabulary and academic performance have been found, the correlations are not sufficiently strong for academic vocabulary to serve as a predictor of academic performance in itself (e.g. Cooper, 1999). In order to establish whether an alternative measure of vocabulary competence could serve as a more reliable predictor of academic performance, I investigated the relationship between the use of academic vocabulary, low frequency vocabulary (i.e. the 5000-word and 10 000-word levels), and lexical bundles in student writing, and their academic results over three years of undergraduate study. The analysis of student academic writing was based on the students’ essays and on the written component of an IELTS test conducted at the start of their first year of study.

1.3 Rationale for this study

The primary motivation for this study is to determine the degree to which academic vocabulary, lexical bundles and the IELTS tests are able to provide an indication of potential academic performance. This investigation explores related issues such as the relationship between use of academic vocabulary and academic performance, which bundles are used most frequently by students and published writers in the discipline of psychology, and to what degree these

overlap, differences in the use of lexical bundles by students and published writers, students' difficulties with particular bundles, and the correlation between IELTS test results and academic performance. The rationale for considering each of these issues is discussed in this section.

Despite recent debate regarding the relevance of academic vocabulary lists (Eldridge, 2008; Hyland and Tse, 2007), a considerable amount of key research into aspects of academic vocabulary is continuing, including studies of related collocations and the impact of academic vocabulary on English for Academic Purposes programmes (Durrant, 2009; Nagy and Townsend, 2012; Paquot, 2010; Nizonkiza, 2014). Following from the studies by Cooper (1999) and Scheepers (2014) at the University of South Africa in which academic vocabulary was found to correlate strongly with academic performance, the current study explores whether academic vocabulary can similarly be used as a predictor of academic performance within the Wits environment, and whether a consistent pattern emerges across all three studies, while at the same time investigating the possibility that the 5000-word or 10 000-word frequency level may be a better predictor.

Considerable attention has been given to lexical bundles since Biber et al. (1999) identified these as a discrete lexico-grammatical feature. Although by their nature commonly occurring, lexical bundles are not defined in terms of conventional grammar structures and so are not easy to teach. A second reason that they are not introduced as a lexical feature within classrooms is that, as far as they are recognised, they are generally assumed to be semantically transparent and therefore easily understood, for example '*as a result of*' and '*is based on the*'. However, this assumption is questionable as bundles have been found to be used inappropriately by second language students to the extent that the correct use of bundles has been said to signal a degree of mastery of the discipline (Cortes, 2004 and Hyland, 2008a). It may be argued on this evidence that the syntactic, semantic and pragmatic features of bundles are not easily accessible to language learners. Recognition of lexical bundles as an area of interest within corpus linguistics is therefore growing on grounds such as that they cover a significant percentage of texts, serve as "building blocks of discourse" (Biber, Conrad and Cortes, 2004:400) in that they consist of fixed lexico-grammatical sequences which provide frameworks for new information (e.g. '*as a matter of + fact / interest / concern / curiosity*'), and that "learning to write well entails learning to use formulaic sequences⁴ appropriately" (Li and Schmitt, 2009:86).

⁴ Terms such as 'formulaic sequence', 'lexical phrase' and 'multi-word sequence' all refer broadly to frequently used combinations of words that convey a particular meaning, including fixed expressions such as '*Have a good day*', idioms such as '*a fish out of water*' and lexical bundles, as discussed in Chapter 2 (§2.2.2, §2.3 and §2.3.6).

Various studies have considered the different uses of lexical bundles by published writers as opposed to students across a range of academic disciplines. Cortes (2004) identified lexical bundles in a corpus of history and biology journals. She tagged these as “*target bundles*”, and compared the use of these bundles by academic writers to their use by students. She found firstly that student writers used these target bundles far less frequently than did published writers, and secondly that, when they were used by students, their functions often did not correspond to those in the journals. Cortes (2004:398) suggests that there are still a number of unanswered questions about the use of lexical bundles across different registers, and the extent to which the writing of published authors differs from that of students across certain disciplines. This viewpoint serves to provide further motivation for my research.

One of the features characteristic of second language writing is the failure to use lexical phrases correctly. Learners of English tend to overuse a few phrases, not having access to a broad range of expressions, and not always knowing how to apply those with which they are familiar appropriately. There is “a general consensus that [these phrases] are difficult for L2 learners to acquire” (Yorio, 1989, in Hyland, 2008b:7) as correct and appropriate usage requires a command of the associated register as well as lexico-grammatical structure. This argument with regard to lexical phrases applies equally to lexical bundles. Learning to use the lexical bundles specific to a discipline appears to contribute to a sense of communicative competence within that field of study. The analysis of such fixed phrases within each discipline should therefore help the learner acquire the rhetorical tools expected (Hyland, 2008b:5). The aim of adding to the growing body of knowledge on how these lexical bundles are used within a specific discipline, namely, psychology, is an additional rationale for this study.

Linked to the questions surrounding the correct use of bundles and ease of acquisition, is the question of why students don’t necessarily make use of a range of lexical bundles (Cortes, 2004:421). Issues such as whether students experience difficulties with certain lexical structures and whether they believe their language ability has inhibited their academic performance in any way are addressed in a series of interviews towards the end of the third year of study. The aim of these interviews is to provide a meaningful context for the results of the quantitative analyses, enabling more accurate interpretation of the results.

Another key issue is the question regarding the degree to which IELTS serves as an indicator of academic performance. Although the IELTS test was designed as a placement test rather than a gate-keeping mechanism (Appendix H), it is nevertheless used in the latter capacity by Wits University as obtaining a minimum score on the IELTS test is one of the entrance criteria for international non-L1 students. It may therefore be argued that the University views the

IELTS test scores as predictors of academic performance. One of the arguments against using IELTS as a screening mechanism rather than a placement test relates to genre differences. While the IELTS test represents the college composition genre in which students are required to write an opinion piece based on their own ideas, without reference to external sources, the academic essay requires that students refer to a number of sources, and then integrate and evaluate the arguments presented by those sources in their own words. Following from previous research into language proficiency and academic success, this study examines this relationship at Wits University by comparing the IELTS scores of a sample of students to their academic results. Given the role of the IELTS test within Wits, “it is important to investigate the extent to which current IELTS levels are predictive of academic performance in specific academic settings” (Woodrow, 2006:52).

1.4 Research aims and questions

In the broadest sense, this study is aimed at making a contribution at the methodological-theoretical, descriptive and applied levels. The first of these entails the development of a longitudinal corpus of student writing in parallel with a corpus of published writing in the same discipline. The descriptive contributions follow directly from the development of these corpora, as the student and published corpora are compared to determine differences in aspects of academic vocabulary and lexical bundle use, while the first-year and third-year student corpora are compared for evidence of acquisition of lexical bundles over the course of the three-year degree. Further descriptive contributions relate to the effectiveness of the 5000-word and 10 000-word levels as predictors of academic performance. The main applied contribution relates to the development of lexical bundle tests. In summary, the overall aims of this study are:

1. To examine the relationship between measures of students’ high-level vocabulary (i.e. academic vocabulary, 5 000 and 10 000-word levels) and their academic performance.
2. To examine the relationship between students’ use of the lexical bundles that are typical to published writing within a discipline and their academic performance.
3. To compare the use of academic vocabulary and lexical bundles in the writing of students who are first-language speakers of English (L1), with the writing of students for whom English is an additional language (AL), using published writing from the discipline as a benchmark.
4. To explore the extent to which there is development in students’ use of academic vocabulary and lexical bundles over the course of a three-year undergraduate degree.

5. To compare the use of academic vocabulary and lexical bundles in student academic writing to their use in IELTS writing tests.

The aims regarding academic vocabulary are addressed in the course of investigating the following research questions:

- a. Is there a relationship between students' use of academic vocabulary in their essays and their academic performance, as measured by their essay results over the course of their undergraduate studies?
- b. Is there a relationship between students' results on the academic and low-frequency components of receptive and productive vocabulary tests and their academic performance, as measured by their essay results during the course of their undergraduate degree?
- c. Is there a difference in the density of academic vocabulary used by L1 students and AL students, relative to the density of academic vocabulary used by published writers?
- d. Is there a difference in the density of academic vocabulary used by first-year and third-year students, relative to the density of academic vocabulary used by published writers?
- e. Is there a difference in the density of academic vocabulary used by students in their essays and that used in IELTS writing tests, taking into account the differences in length of texts?
- f. Is there a relationship between appropriateness of use of academic vocabulary by students relative to published writers, and their academic performance?

As mentioned previously, 'natural' use of lexical bundles apparently signals or reflects integration into a particular discourse community (Hyland, 2008b). Following from this viewpoint, Hyland (2008b:5, 8) concludes that the expectations around learners within a particular discourse community include evidence of the ability to use the lexical bundles specific to that community appropriately, and that "disciplinary-sensitive" bundles should be identified for classroom teaching practice. This argument provides strong motivation for further studies into both appropriate and idiosyncratic use of lexical bundles across a range of disciplines. My study aims to add to the body of knowledge on what is regarded as appropriate use in the field of psychology. To address the aims regarding lexical bundles, the following questions are considered, again taking into account the differences in lengths of texts in each case:

- g. Is there a relationship between density of students' use of lexical bundles and their academic performance over the course of their undergraduate studies?
- h. Are there differences in the density, structures and functions of lexical bundles used by L1 and AL students, relative to the bundles used by published writers?
- i. Are there differences in the density, structures and functions of lexical bundles used by first-year as opposed to third-year students, relative to the bundles used by published writers?
- j. Are there differences in the density, structures and functions of lexical bundles used by students in their essay writing as opposed to in IELTS Task 2 writing tests?
- k. Is there a relationship between the appropriateness of use of lexical bundles by students relative to published writers, and their academic performance?

The extent to which the IELTS test serves as a reliable measure of academic performance is addressed in the following two questions:

- l. Is there a relationship between students' results on the IELTS writing test and their academic performance, as measured by their essay results?
- m. Is there a relationship between students' results on the IELTS reading test and their academic performance, as measured by their essay results?

These questions form the bases for the operational hypotheses in terms of which each hypothesis is tested, as discussed in Chapter 3. The research approach is outlined in the next section, and an explanation of key terms and concepts is provided.

1.5 Methodology

This study exemplifies descriptive research in that it is non-experimental but involves quantitative data and analysis as well as more qualitative data and interpretation (Seliger and Shohamy, 1989:124). This combination of quantitative and qualitative approaches is referred to by Dörnyei (2007:44-45) as mixed methods research, an approach which he claims "can bring out the best of both paradigms" and improve validity. This section provides an overview of the participants in the study, the methods used to develop the corpora and identify lexical bundles, quantitative measures such as the vocabulary tests and IELTS tests used, as well as both quantitative and qualitative methods used to analyse the data.

The participants were drawn from the psychology students who registered for their first year of study at Wits University in 2011 (N = 782). Psychology was selected as the the focus of this

study primarily because it is one of the most popular subjects in the Faculty of Humanities. Not only does a considerable proportion of humanities first-year students register for psychology, but many also continue on to third year, thereby positively affecting throughput rate. The number of students likely to complete a course is a critical consideration in any longitudinal research since one of the main disadvantages to such an extended study is the natural attrition of participants (Dörnyei, 2007). While the study was initially based on a random sample of the first-year group who had completed the receptive vocabulary test in 2011, the subsequent second-year students were selected from those who had volunteered for the productive vocabulary test at the start of 2012 and had indicated their intention to continue with third-year psychology as one of their majors in the three-year undergraduate degree. This intention was established by means of a demographic survey conducted at the same time as the vocabulary test, and designed to obtain background information on the students' personal, educational and linguistic profiles. The questions on language background were aimed at establishing the students' first language, whether English was spoken as a first, second, third or fourth language and what language was spoken in the home, and so formed the basis on which students were identified as L1 or AL speakers. Given that this is a longitudinal corpus linguistic study, the psychology essays of those students participating were collected over the duration of their undergraduate studies and scanned for inclusion into the student corpus.

The corpus for this study was drawn from IELTS writing tests, student essays and published writing within the field of psychology. These texts and articles were scanned into an electronic format and then "cleaned [so that] no titles, headers, footers, captions, scientific formulae or references are included" (Cortes, 2004:403). The student academic writing was compared to a databank of published writing drawn from journal articles in the same discipline. While a substantial portion of these articles were given as prescribed and recommended reading, the remainder were articles related to the essay topics, and were drawn from the top 50 journals in the field, as ranked by the Journal Citation Reports, a measure of the impact of journals (§3.5.2.2). In order to compare the students' use of lexical bundles with what may be considered the norm in psychology, an analysis of the published writing was conducted to assess both the academic vocabulary used as well as the structures and functions of the lexical bundles used by experts in the field. The procedure used to analyse lexical bundles is described following the overview of the measures used to test vocabulary.

In order to test the students' vocabulary, all participants were asked to complete both receptive and productive vocabulary tests aimed at measuring their knowledge of high-level vocabulary items, that is, academic vocabulary as well as items from the 5000-word and 10 000-word frequency lists. The receptive vocabulary test was a revised version of Nation's Vocabulary

Levels Test (Belgar and Hunt, 1999), and was therefore a measure of vocabulary breadth rather than depth. The productive vocabulary test was adapted from Laufer and Nation's test of "controlled productive ability" (1999), designed to measure syntactic, semantic and pragmatic knowledge. This is a cloze-test based on a text in which the first letters of each test item are provided. For example, '*The book covers a series of isolated epi_____ from history*' (Laufer and Nation, 1999:37). The vocabulary test scores were then compared to students' performance on academic essays over a three-year period. In addition to these assessments of the students' vocabulary, this study examined their use of academic vocabulary by analysing all essays using the VocabProfile program (Cobb, 2002). This program lists words used in written texts according to their frequency levels, and so assesses productive rather than receptive vocabulary. The use of academic vocabulary by AL and first-year students was compared with the occurrence of these features in the writing of L1 and third-year students in relation to that of published writers, taking into consideration density of use as well as idiosyncratic as opposed to more standard use. The qualitative aspect of this analysis was conducted by means of manual scrutiny of concordance lines.

Lexical bundles are defined as groups of words that commonly co-occur across a range of texts. Consequently, the primary features used in their identification are frequency and distribution criteria. The analysis of all texts was performed by means of Wordsmith Tools 6 (Scott, 2012), a computer program able to analyse lexical bundles or word clusters, collocates, word frequencies and keywords. For the purposes of this study, lexical sequences that occur at least 40 times per million words were regarded as lexical bundles, following the methodology used by Hyland (2008b). Based on the principle of normalisation (Chen and Baker, 2010:32), WordSmith Tools (WST) was programmed to identify 4-word combinations that meet specific frequency and distribution thresholds, according to the size of the corpus. WST was also programmed to ignore all numbers in the texts, to consider every possible sequence of 4-word combinations without disregarding high frequency lexical items such as '*the*', and to take punctuation into account so that any words spanning a punctuation boundary would not be included in the count.

Once the most frequently-occurring 4-word lexical bundles had been identified, the grammatical structure and rhetorical function of each bundle was classified. The most common lexical bundles in the published corpus were identified as 'target bundles' (Cortes, 2004), and their use in the student corpus assessed in comparison to that of the published corpus. As with academic vocabulary, the use of lexical bundles by AL and first-year students was compared with that of L1 and third-year students. The bundles that occurred most frequently in the student corpus were also compared to the high frequency bundles in the published corpus to determine

differences in density. This was done by means of the WST concordance program which identifies 'key' lexical bundles, i.e. those that have significantly different densities of occurrence in two selected corpora. The aim of this procedure was to establish differences between the student and published corpora in density, variety and accuracy of use of lexical bundles, and so to check for idiosyncratic use by both L1 and AL students as well as high and low achievers. This qualitative analysis was again conducted by means of manual scrutiny of concordance lines.

In addition to the vocabulary tests, participants completed the reading and writing components of an IELTS test at the start of their first academic year. The IELTS writing test answers were then assessed in terms of the occurrence of academic vocabulary items and lexical bundles in relation to those used in the academic essays, taking into account the density, structures and functions of the bundles used. The scores for each component of the IELTS reading and writing tests were correlated with each student's essay results as a measure of their academic performance.

Finally, in order to obtain qualitative data on the students, a sample of third year students were interviewed for the purposes of triangulation. The aim of these interviews was to establish the students' views on the reading material prescribed for psychology and the effect of reading on their writing; explore their awareness of the lexical bundles used predominantly in the field of psychology; ascertain the degree to which they felt their language skills contributed to or hampered their academic performance; and discover any general problems which they may have experienced during their undergraduate studies.

1.6 Structure of the thesis

This thesis comprises five chapters, the first of which provides an overview of the study, presents a broad outline of the educational context in which the research is situated as well as the rationale for this study, indicates the research aims and questions on which the hypotheses are based, and provides a summary of the methodology used.

Chapter 2 presents the literature review, and so provides discussion of related research. The three themes that form the focal points for the literature review are academic vocabulary, lexical bundles and the IELTS test as a predictor of academic performance. This discussion investigates research questions, methodologies and findings in previous studies that have direct bearing on my own study.

Chapter 3 provides an overview of the research aims, questions and hypotheses, as well as a description of the research design. As some of the questions which arose from previous research highlighted the need for a longitudinal study that would attempt to assess the development of lexical bundles over an extended period, my study is based on a three-year prospective longitudinal study (Dornyei, 2007:82). A summary of the pilot study is provided, with an explanation of how the findings influenced the main study. A detailed account of the methodology used in the main study is then presented, including a description of the participants, the data collection procedures, the vocabulary and IELTS tests, the demographic surveys, and the development of the corpus. The various aspects of the quantitative analyses and qualitative investigations are described, including the statistical procedures employed, the methods used to assess vocabulary and lexical bundle use, and the interviews conducted.

Chapter 4 is the most substantial chapter of the thesis as it details the results and findings, with related graphs and figures provided as illustration where necessary. The results of the quantitative analyses and qualitative investigations are presented, followed by a detailed discussion of the findings.

Chapter 5 presents the overall conclusion in which the main findings are highlighted, the study's contribution is considered, and the pedagogical implications explored, with recommendations for classroom applications. The limitations of the study are then considered followed by suggestions for possible future research.

1.7 Conclusion

The underlying aim of this research was to develop a longitudinal corpus of student writing that would help to address a number of questions. These include how to assess students' academic potential at the start of their university careers in order to identify those in need of academic support programmes, what differences are found in the use of academic vocabulary and lexical bundles by various groups of undergraduate students and by published writers, and how to address these differences in order to improve students' use of the academic register required by their field of study.

Chapter 2

Literature review

2.1 Introduction

The aim of this chapter is to present an overview of the theories and research that form the background to my study. This discussion of related studies serves to illustrate knowledge gaps to be targeted, provide the theoretical background to my research aims and questions, and present a broad outline of research methodologies that are directly applicable to my own study.

Given that the focus of this study is the question of whether and to what degree aspects of vocabulary influence academic performance, the first two of the three focal themes in this literature review are 'academic vocabulary' (§2.2) and 'lexical bundles' (§2.3), both of which are considered in the context of academic prose. These concepts are defined and key features explored in the light of relevant studies and classroom applications.

The third theme, 'IELTS as a predictor of academic performance' (§2.4), ties in with the question of the degree to which the IELTS writing test in particular is an accurate measure of academic potential within the context of South African universities.

2.2 Academic vocabulary

This section presents a discussion of the literature on academic vocabulary as a form of lexis that plays a key role in university registers. Academic vocabulary is introduced by providing a definition of the term and presenting key features used in the identification of this type of vocabulary. In order to illustrate the relationship between academic vocabulary and other categories of vocabulary, an outline is presented of the classification of sets of vocabulary items according to frequency and distribution criteria.

The development of academic word lists is discussed (§2.2.1) and the concept of 'word family' explored (§2.2.1.1), as this concept is essential to the construction of such word lists. The question of whether an academic word list is applicable across all disciplines is considered, and the debate relating to the role and degree of representation of Coxhead's (2007) Academic Word List in particular is examined (§2.2.1.2). This section then considers academic words as formulaic sequences (§2.2.2), examining the degree to which academic vocabulary items can

be regarded as having discrete meaning. Possible approaches to homonyms and polysemes in the development of academic vocabulary lists are discussed, and academic collocations explored. Measures of academic vocabulary are described in the context of the assessment of vocabulary proficiency (§2.2.3), and the link between vocabulary and reading comprehension, as well as between academic vocabulary and language proficiency considered (§2.2.4). Finally, approaches to the teaching of academic vocabulary items are touched on.

In order to situate academic vocabulary within a framework of different types of vocabulary, it is necessary to describe the categorisation of vocabulary items on which my study is based, and explain the relationship between academic vocabulary and other categories. Academic vocabulary is generally regarded as one of four sets of vocabulary items classified according to frequency of occurrence and distribution (Coxhead and Nation, 2001:252; Hyland and Tse, 2007:236). The first set comprises high frequency words that consist of about 2000 word families, and which generally cover between 70% and 80% of texts. The second set is academic vocabulary, some of the most frequent examples of which were compiled into a list of 570 words that cover about 8.5% to 10% of the running words in academic texts (Coxhead, 2000). The third set is technical vocabulary, which is subject-specific and “which provides coverage of up to 5% in a text” (Coxhead and Nation, 2001:252). In contrast to academic vocabulary, technical vocabulary “occurs in a specialist domain and is part of a system of subject knowledge” (Chung and Nation, 2004:252). In similar vein, Baumann and Graves (2010:6) refer to such technical terms as “domain-specific academic vocabulary”, and argue that this type of vocabulary is critical to the development of “a body of domain knowledge”. The last set is that of low frequency vocabulary items which occur infrequently and are usually restricted in range. The percentages given above illustrate that knowledge of the 2000 high frequency words in West’s (1953) General Service List (GSL), together with knowledge of the words in the Academic Word List should provide coverage of between 78.5% and 90% of the words in academic texts, with an understanding of the technical vocabulary accounting for a further 5%, taking the maximum possible coverage on the basis of the three sets of vocabulary to 95%. The question of what vocabulary coverage is required for effective reading forms part of a later discussion about the relationship between academic vocabulary and language proficiency (§2.2.4).

The principle on which lists of academic vocabulary have been developed is that a fairly wide range of words, not commonly found in non-academic texts, occurs regularly throughout academic texts across all disciplines. The features of academic vocabulary are then that these items:

- (a) [are] reasonably frequent in most academic texts from a wide range of academic disciplines,
- (b) [are] relatively infrequent in other types of texts such as novels or colloquial spoken texts,
- (c) [come] largely from French, Latin or Greek, and (d) [are] not obviously connected with any one subject area.

(Wang Ming-Tzu and Hyland, 2004:292.)

Words such as *appropriate*, *criteria*, *demonstrate* and *emphasis* (Coxhead, 1998) play a supportive rather than a central role, and so are not highly salient (Coxhead, 2000). In terms of this perspective, academic vocabulary items, unlike technical terms, would not necessarily strike the reader as words that require special attention. This view ties in with Durrant's definition of academic vocabulary as:

sub-technical words which are common across academic disciplines, but which may cause problems for learners because they are neither sufficiently frequent in the language as a whole to be learnt implicitly nor part of the technical lexicon which is likely to be taught as part of subject courses.

(Durrant, 2009:157.)

Support for the argument that students are more likely to experience problems with general academic vocabulary than with technical terms is provided by Hubbard's (1996) study into the degree of contextual support provided for these two types of vocabulary in a study guide written for first-year university students. Hubbard (1996:100-101) proposed six levels of contextual support, from the provision of a prototypical definition of the term or lexical item that includes a description of distinguishing features (e.g. "***Psycholinguistics***, as the name implies, is an interdisciplinary subject that incorporates research methods, findings and theories from both linguistics and psychology"), through non-prototypical and partial definitions, to provision of semantically related items (e.g. synonyms and hyponyms), to the use of a collocation in the sentence that relates to the meaning of the relevant item (e.g. "*What does it mean to say that someone suffers from **aphasia**?*", where the use of the collocation 'suffers' suggests that the term 'aphasia' refers to a medical condition), and finally to instances where no support is provided. Hubbard found that technical terms were given more explicit levels of contextual support than general academic vocabulary, presumably on the assumption by the writer that, while students cannot be expected to understand technical terms specific to the discipline, particularly in their first year of university study, they should already be familiar with the general academic items that are widely used across all 'scholarly' texts. However, given Cooper's (1995) finding that first-year students of linguistics who were L2 speakers understood fewer than half of the general academic words they were tested on, it would appear that more of the sort of contextual support provided for technical terms should be extended to general academic

vocabulary on the understanding that comprehension of these words is key to the interpretation of academic text.

To contextualise the explanation of ‘academic vocabulary’ as words found occurring with particularly high frequency in academic texts, Nagy and Townsend (2012:92) define academic language as “the specialised language, both oral and written, of academic settings that facilitates communication and thinking about disciplinary content”. Academic vocabulary is therefore regarded as inseparable from academic language.

According to Nagy and Townsend (2012:93-95), additional features of academic language include a predominance of Latin and Greek rather than Germanic vocabulary, morphologically complex words as a result of affixation, a high proportion of nouns, as well as a high degree of lexical density (measured as amount of information per unit of text) and abstractness. One of the more significant features of academic language is referred to by Nagy and Townsend (2012:94) as “grammatical metaphor”, in which a part of speech is used to convey a non-prototypical meaning. In other words, “the expression of meaning is metaphorical in relation to a different way of expressing the same meaning which would be more congruent” (Thompson, 1996:165), an idea derived from Halliday’s Functional Grammar. For example, the phrase *Her retention of this belief is problematic* is a metaphorical expression of the more literal phrase *That she continues to believe this is problematic*, with the more compact metaphorical expression *retention of* conveying the idea of holding on to a particular belief. A characteristic feature of grammatical metaphor that is common to academic writing, namely nominalisation, occurs when a verb or adjective is changed to a noun by the addition of a suffix (e.g. *retain* (v.) → *retention* (n.) and *normal* (adj.) → *normalisation* (n.)). Berman (2007, in Nagy and Townsend, 2012:94) proposes that, in the development of the individual, “nominalisations are a mark of high-level, formal prose style and a very late morphosyntactic development”. Nominalisation also means the increased use of prepositional phrases as well as attributive nouns and adjectives, all of which serves to enable “the expression of abstract and complex concepts” and the relationships amongst them (Nagy and Townsend, 2012:95).

2.2.1 Academic word lists

The University Word List (UWL) was compiled by Xue and Nation in 1984 following their realisation that academic texts contain a number of vocabulary items specific to academic prose, and that inadequate knowledge of these items frequently impacts on students’ understanding of the text. This list was based on four existing word lists, those of Champion and Elley (1971) and Praninskas (1972), who had identified certain items as the most likely to be

encountered across a range of academic texts, and those of Lynn (1973) and Ghadessy (1979), who had compiled lists based on students' annotations of words in academic texts on the assumption that students annotate words they find difficult. Xue and Nation (1984) edited and combined the four lists to create the UWL, including items such as *deviate*, *equivalent* and *postulate*. Also included in this list are subtechnical terms which serve to define concepts in scientific disciplines, while at the same time being familiar to language users outside the field of expertise, for example, *colloquial* and *homogenous*.

However, in criticism of the UWL, Coxhead (2000:214) argues that "as an amalgam of the four different studies, it lacked consistent selection principles and had many of the weaknesses of the prior work". On the grounds, then, that the corpora on which the UWL was based "were small and did not contain a wide and balanced range of topics" (Coxhead, 2000:214), Coxhead created the Academic Word List (AWL) as an alternative to the UWL.

The AWL is based on a 3.5 million-word corpus of academic texts from 28 subject areas within the fields of law, commerce, science and the arts. Items qualified for inclusion in the word list if the members of a word family occurred at least 100 times throughout the corpus, and at least 25 times in each field. In requiring words to be distributed across a range of subject areas, Coxhead was attempting to ensure that words were not included as a result of topic-bias in one particular section. For this reason she regarded frequency as secondary to range. As a result of this approach to the selection of academic words, Coxhead argues that the AWL is slightly more representative of academic vocabulary in that it covers 10% of the 3.5 million word corpus of written academic texts developed for the compilation of the AWL, while the UWL covers 9.8% of this corpus, despite the fact that the AWL only contains 570 word families in contrast to the UWL's 836. Coxhead (2000:226) therefore concludes that the AWL "provides better return on learning" as it contains fewer words for the same degree of coverage.

The words in the AWL are divided into ten categories according to frequency of occurrence, from the most frequently occurring in Sublist 1 (e.g. *analyse*, *consist*, *distribute*, *establish* and *significant*) to the least frequently occurring in Sublist 10 (e.g. *albeit*, *conceive*, *integrity*, *reluctance* and *whereby*). In each case the headword of the word family (§2.2.1.1) is provided, with the inflections and derivations within the word family that occur in academic texts. For example, in the case of the headword *resolve* in Sublist 4, the inflections *resolved*, *resolves* and *resolving* are listed, as well as the derivations *resolution* and *unresolved*. The most commonly occurring form of each word family is indicated by the use of italics.

It is clear from this description of Coxhead's (2000) Academic Word List that an explanation of the concept 'word families' is required for an understanding of the method used to compile the AWL. For this reason 'word families' are considered at some length below before a critique of the AWL is discussed (§2.2.1.2).

2.2.1.1 Word families

Coxhead (2000:217-218) drew on the concept of 'word family' as a means of identifying what should constitute a word for the purposes of the word list. A word family was defined as a stem plus "all inflections and the most frequent, productive, and regular prefixes and suffixes". The principle underlying this concept is that learners with an understanding of basic morphology should have few problems understanding the inflected forms as well as the regular derived forms of the stem or headword. For example, a learner who knows the meaning of the headword *assess* as a verb would understand that *assessed* was the simple past tense form, *assessing* the present participle form, and *assessment* the noun. Gardner (2007), however, argues that members of word families have different degrees of transparency as there are a range of possible morphological relationships. This raises the question of whether learners of different skill levels are always able to identify the meaning of every member of a family, particularly when their first encounter with a word family is through a derivation rather than through the stem. For instance, the adjectival form *exemplary* is not obviously linked to the noun form of the stem, *example*. Jiang (2000) proposes that syntactic and morphological specifications are the last aspects of words to be learnt in a second language, with the fossilisation of these lexical items frequently occurring before this stage is reached. In a similar vein, Gardner (2007) suggests that, as derivations are learnt incrementally over a long period, with the result that inflectional morphology is acquired before derivational morphology by both first- and second-language speakers, learners with a low level of language proficiency are likely to struggle with the identification of the base form when they encounter an unfamiliar derivation. Similarly, Schmitt and Zimmerman (2002:147) propose that inflections and derivations "impose different learning burdens":

The rule-based nature of inflections ... appears to facilitate learning. ... Conversely, the formation of derivatives ... is not always governed by transparent rules, so learners must often decide on the correct form case by case.

Schmitt and Zimmerman (2002:147) therefore draw a distinction between "system-based learning" in the case of inflectional morphemes and "item-based learning" in the case of derivational morphemes. These authors examine a learner's ability to recognise an unknown

derivation on the basis of their familiarity with another member of the same word family. This skill is referred to as the 'facilitative effect'. However, the results of their study indicate that knowledge of one word in a family does not necessarily entail productive knowledge of other forms in the family. To assist with the interpretation of meaning, they recommend explicit teaching in which the relationship between the stem and the derived form is clarified, particularly when this relationship is not transparent.

Following from the discussion of complex morphological affixes above, and in line with Nagy and Townsend's (2012) assertions regarding the high proportion of Greek and Latin vocabulary within the academic context, Coxhead (2000:228-229) concludes that "more than 82% of the words in the AWL are of Greek or Latin origin". It seems clear that derivational suffixes occur more commonly in the written mode than in spoken discourse, and are particularly associated with academic discourse. It is on the basis of the distinction between Anglo-Saxon and Graeco-Latin vocabulary that Corson (1985) proposes the existence of a 'lexical bar' in English that accounts to a considerable extent for poor academic achievement. Corson compared the high-frequency, largely monosyllabic vocabulary of Anglo-Saxon origin with that of Graeco-Latin origin, and found that Graeco-Latin vocabulary dominates academic vocabulary, making knowledge of this vocabulary essential for academic success. Working from the assumption that there is a correlation between educational background and social level, Corson found that degree of familiarity of Graeco-Latin vocabulary differed according to scholars' socio-cultural backgrounds. One of the primary reasons for this difference is that the lexical bar separates groups along social lines comparable to the concepts of 'blue-collar' versus 'white-collar' status. Thus, within the South African context too, scholars from an advantaged educational background, in which there tends to be a higher level of education within the family as a whole (§1.2), are more likely to be exposed to written texts, thereby giving them early access to the primary source of Graeco-Latin vocabulary, as its use is essentially literary (Corson, 1997:677). Scholars from disadvantaged educational backgrounds, on the other hand, tend to have fewer opportunities to participate in the discourse associated with a highly literate culture, and therefore do not develop a lexical base that is sufficiently broad to allow for the interpretation of less frequent items through an understanding of the context in which they occur. Furthermore, such disadvantaged scholars are frequently not familiar with the types of derivations that commonly occur in the case of Graeco-Latin forms, and so are likely to find the extrapolation of meaning more challenging (e.g. the addition of the suffix *-isation* onto the adjective *normal* to form the noun *normalisation*: in this case an understanding of the word *normal* would not necessarily extend to an understanding of the derivational form).

Corson's argument centres on types of vocabulary, or frequency levels. He estimates that between 65 and 100 per cent of specialist vocabularies in academic disciplines are derived from Graeco-Latin words, the use of which increases progressively in school texts. This argument clearly also applies to university studies and the use of academic vocabulary, particularly in the case of expository texts which involve explanation rather than description. In fact, Corson (1997:673) suggests that "vocabulary diversity is the most consistently used marker of proficiency in education".

Following Corson's recommendation that students are made more aware of academic vocabulary (Corson, 1997:709), Gardner (2007:250) argues that, as there are strong correlations between morphological knowledge and reading skills, it is essential that learners are equipped with the skills necessary to interpret unknown words. As with Schmitt and Zimmerman (2002), Coxhead recommends a morphological approach in the language classroom, that is, teaching the form and meaning of prefixes, suffixes and stems. This should help learners to apply the principles underlying the concept of word families, enabling them to use their understanding of morphological structures and familiar vocabulary to analyse complex words.

2.2.1.2 Critique of the Academic Word List

Since Coxhead's extensive revision of the UWL in 2000, a number of studies have been conducted into specific aspects of the word list in order to assess its validity. Hyland and Tse (2007:235) explored the distribution of the words in the AWL across their own 3.3 million-word corpus, and found that "individual lexical items on the list often occur and behave in different ways across disciplines in terms of range, frequency, collocation, and meaning". Following this finding, these authors question the general assumption that a core academic vocabulary is applicable across all disciplines. They argue that, as with the discipline-specific functions of lexical bundles (Hyland, 2008b), the more discrete lexical items that occur with high frequency in academic contexts tend to be used differently in unrelated fields, thereby necessitating the development of discipline-based word lists:

In other words, different views of knowledge, different research practices, and different ways of seeing the world are associated with different forms of argument, preferred forms of expression, and, most relevantly, specialised use of lexis.

(Hyland and Tse, 2007:247-8.)

Following from this, Hyland and Tse (2007:249) regard technical and academic vocabulary as occurring on a continuum, ranging from “terms which are only used in a particular discipline to those which share some features of meaning and use with words in other fields”. On the grounds of the argument that the word list does not represent ways in which the words are actually used in the context of each discipline or subject, Hyland and Tse regard the promotion of the Academic Word List for students’ development as contentious as it involves considerable learning effort with little guarantee of return.

One particular criticism of Coxhead’s (2000) methodology is that the disciplines included in the economics corpus were far more closely related than those in the sciences or arts, with the result that finance-oriented terms such as *corporate*, *finance*, *invest*, *partner* and *purchase* dominate the corpus (Hyland and Tse, 2007:248). They also argue that the addition of a legal corpus has resulted in the inclusion of legal terms such as *legislate*, *regulate* and *compensate* which are not widely encountered in academic discourse. For this reason, although the AWL offers good overall coverage of the academic corpus, this coverage is unevenly distributed and, with West’s (1953) General Service List (GSL), fails to account for 22% of the words in Hyland and Tse’s (2007) science corpus. Furthermore, Hyland and Tse (2007:249) are critical of Coxhead’s assumption that the GSL should serve as a base for the acquisition of academic vocabulary. They suggest that, firstly, learners do not follow a linear path in the process of learning new vocabulary, and, secondly, that the GSL is outdated and “does not reflect current usage” (Hyland and Tse, 2007:249).

In conclusion to their review of Coxhead’s word list, Hyland and Tse (2007) argue that the AWL has limited usefulness, and that learners would benefit considerably more from guidance on the meanings and uses of the academic vocabulary specific to their field of study. Given that my study focuses on the academic discourse particular to psychology, it is unlikely to shed any light on the question of the applicability of the AWL across disciplines, but may throw some light on the proportion of items from the AWL used in students’ and published writing in this discipline, and the relationship between the students’ use of this vocabulary and their academic performance.

In response to Hyland and Tse’s (2007) criticism of the AWL on the grounds that word lists should be based on field- or subject-specific corpora, Eldridge (2008) counters this argument by pointing out that much of the academic environment is interdisciplinary, that students will not necessarily work in the field in which they have trained, and that the practical constraints of time and cost have to be taken into consideration in the development of academic support material. On the grounds of these points as well as Read’s (2007:109) view that there is, as

yet, no definitive word frequency list in English, either for general vocabulary or for specific areas, one could argue that the AWL should continue playing a supportive role. In this role, the AWL would be used by EAP trainers to explain the most frequent meaning of each word, while subject-specialists would draw the attention of students to those words that have specific meanings within their field, and therefore warrant explicit explanations of the way in which each word is used in that context. This proposal is supported by Granger and Paquot (2009) who argue for a balanced approach that recognises both the discrepancies of academic items in different disciplines, and the realities of students' needs within the context of the EAP classroom. According to Paquot (2010:26), it is generally possible to identify common links between the subject-specific use of the word and the more general meaning, a view that relates back to Wang and Nation's (2004:310) recommendation to have students search for a single meaning underlying polysemous words (§2.2.2). For example, in the context of linguistics *derivation* refers to "the process of forming new words according to a fairly regular pattern on the basis of pre-existing words" (Hurford and Heasley, 1983:206), while within a broader academic context this word has a clearly related meaning as it refers to an offshoot or extract from an original source.

Nation (2011) proposes that the main strength of the AWL is that it can be applied widely across a number of fields. Although he acknowledges that some of the words in Coxhead's (2000) list may be homonyms in that they are used differently in different academic areas, he suggests that this is not a common occurrence on the basis of his research into the degree of homonymy in the AWL (Wang and Nation, 2004). This study is discussed in the next section (see §2.2.2).

Coxhead (2011) responds to Hyland and Tse (2007) with an acknowledgement of the bias in selection procedures that favoured commerce and law over the arts and science fields, with the result that the range of academic vocabulary is not optimally weighted. Coxhead (2011:357) calls for further research "based on more balanced corpora that represent a wider range of subjects within a university". She also recommends investigating words in the list for relations of hyponymy and polysemy in different subject areas. However, Coxhead argues that, before the AWL can be revised, it is essential that the GSL is replaced with a list of 2000 current high frequency words that could serve as a base for the development of more specialised word lists. This ties in with the argument presented by Hancioğlu, Neufeld and Eldridge (2008:463) that academic word lists should be revised to include high frequency items from general, traditionally 'non-academic' English words such as those from the General Service List (1953).

What makes text 'academic', then, is not the occurrence in isolation of certain specific items, but the ways in which certain items 'collocate' and 'colligate', in other words, the ways lexical items co-occur with other lexical and grammatical items.

(Hunston, 2002, in Hancioğlu, Neufeld and Eldridge, 2008:463.)

Based on the premise that academic discourse is not composed solely of discrete lexical items but also involves lexical networks, the next section considers aspects of academic vocabulary such as multiple word meanings and academic collocations.

2.2.2 Academic words as formulaic sequences

In line with the theoretical background in terms of which lexical bundles are regarded as formulaic sequences (§2.3), this section considers ways in which academic vocabulary items conform to the behaviour patterns of formulaic sequences. Bearing in mind that one of the arguments for giving attention to formulaic sequences is that the meanings of words are not independent from the context in which they occur (§2.3.6.2), the extent to which words in the Academic Word List are homonymous or polysemous is examined, with arguments presented for retention or removal of homonyms with discrete meanings. Hyland and Tse (2007) in particular argue for differences in meaning of academic words to be considered on the grounds of what they view as their unrelated uses in various disciplines, and propose that academic vocabulary should only be taught in the specific context in which it occurs. Looking at another aspect of words with multiple meanings, the concept of academic collocation is then discussed, focussing on two-word collocations.

Wang and Nation (2004) investigated the occurrence of homographs in the AWL, looking for evidence to suggest that words with discrete meanings such as *volume* ('an amount of space' vs 'one in a set of books' vs 'intensity of sound') should be excluded from this word list on the grounds that the separate meanings do not occur with sufficient frequency across the required range of academic texts. They distinguish between homonymy and polysemy on the basis that, while homographs (or 'homonyms', which covers both the written form, 'homographs', and the spoken form, 'homophones') have the same form and completely unrelated meanings, polysemes are clearly related meanings of the same form, for example, 'a fishing *line*' vs 'a *line* of people in a queue'. Wang and Nation (2004) argue that, in practice, homonymous and polysemous words form points on a continuum as it is frequently difficult to definitively allocate words to one category, for example, *light* in the sense of '*light* rain' vs '*light* lunch'. The primary argument against the inclusion of homographs in the AWL is that less proficient readers would not be able to work out the appropriate meaning of the word given the surrounding context or

'cotext' from another, more distantly related meaning. However, Wang and Nation (2004:306) propose that grammatical and collocation clues frequently distinguish different meanings of homographs as the separate meanings have different sets of affixes. For example, *consist* meaning 'to stay the same' has the derivational forms *consistent*, *inconsistent*, *consistently*, *consistency*, *consistencies* and *inconsistencies* with no inflectional forms, while *consist* meaning 'made up of' comprises only the inflectional forms *consist*, *consists*, *consisted* and *consisting*.

On consideration of their results, these authors found that, where homographs had been included in the AWL, only one of the meanings generally fulfilled the criteria specified for inclusion in the list:

Where homographs do occur, one of the homographs is typically much more frequent than the other, accounting for at least 95 per cent of the combined frequencies of the homographs. Just as some words occur much more frequently than other words, some meanings of a word occur much more frequently than others.

(Wang and Nation, 2004:309.)

Where word meanings were limited to a particular subject area, they found that these words did not meet the frequency, range and distribution criteria set for inclusion in the AWL. They also found a number of cases in which the separate meanings of a word constituted two or more polysemes. For example, the word *promotion* has two closely related meanings: to further a cause, and to raise someone to a higher position or rank. According to Wang and Nation (2004:298), the base meaning of *promotion* is "putting something or someone forward or up so that it gains more importance or notice in the eyes of others". It is clear that both meanings are derived from this base meaning, and so may be regarded as related polysemes. Following this finding, these authors propose that one of the activities which learners would benefit from is to identify "the central concept behind a variety of uses [of polysemic words]" (Wang and Nation, 2004:310).

While Wang and Nation argue that only 21 of the families in the AWL contain homographs, and propose that most words have very similar meanings across different fields, Hyland and Tse (2007:244) dispute this finding on the basis that, in their corpus, "different disciplines showed clear preferences of particular meanings and collocations". For example, they found that the word *analyse* tends to occur as a noun (*analysis*) in the social sciences but as an adjective (*analytical*) in the field of engineering. Given the uneven distribution of the fields that comprised Coxhead's corpus, with the predominance of commerce and law subjects

(§2.2.1.2), the resulting delimited range of subjects may explain the apparent lack of homonymy as only certain meanings would occur in the given contexts. The basis for this argument links back to Hoey's (2005) theory of lexical priming (§2.3.6.1) in which words take on additional meanings as a result of regular co-occurrence with other items.

In line with Hoey (2005), Nagy and Townsend (2012:96) perceive word meanings as “parts of conceptual networks”, and therefore hold the view that part of a word's meaning is derived from its relationships with other words. Following from this, they believe that students benefit from repeated exposure to academic vocabulary in authentic contexts, and cite studies of intervention research based on the AWL which has clearly resulted in the development of students' academic vocabulary. Although they recognise the polysemous nature of many words in the list, they argue that this simply reinforces the argument that these words should be taught in the appropriate context.

Expanding on the concept of words with multiple meanings, Durrant (2009) extended the idea of an academic word list to incorporate formulaic sequences, and so developed a list of academic collocations. He focussed on ‘positionally-variable collocations’ on the basis that collocations “involve relationships between words which may be separated by other, non-fixed, or semi-fixed words, and which may differ in their position relative to one another” (Durrant, 2009:158). For example:

*There is a **significant difference** between the variables.*

*There was no **significant physical difference**.*

*The **difference** was not **significant**.*

Durrant therefore defined collocations as word pairs that commonly co-occur within a limited span. The second aim of Durrant's study was to further explore the validity of generic word lists by investigating the degree to which collocations occur across academic disciplines. Durrant restricted the span of each collocation to four words, and used MI scores to eliminate frequently co-occurring words not in a collocational relationship (see §2.3.6.1 for an explanation of the MI score). He found that the majority of word pairs were “grammatical collocations”, containing at least one non-lexical item (Durrant, 2009:163). This clearly ties in with Hoey's (2005) view that lexical items tend to cohere with particular grammatical forms. Durrant also found that not many of the collocations overlapped with the items in the AWL, which he suggests “indicates a shortcoming of traditional approaches to identifying academic vocabulary” (Durrant, 2009:164). In addition, a considerable proportion of words in the collocations are listed in the GSL, for example, *address*, *control* and *means*. This raises the issue that words which are

superficially familiar to learners are likely to be particularly problematic as the learners may try to adapt the text to fit the meaning they know. For example, a student may know the more common meaning of *address* as ‘the number and name of the street where someone lives and to which post can be sent’, but not be familiar with the alternative meaning of ‘a speech to an audience’. This student would struggle to interpret the meaning of a sentence such as *Her address had the effect of changing the minds of the voters* if the only meaning for the word *address* applied to this sentence was that of ‘physical abode’. In cases such as this, where the meaning does not easily fit the context, it is essential that students understand that the word is a homonym, and that they should seek an alternative meaning. This problem provides further support for the argument that lexical items should be taught in context.

One of the most notable of Durrant’s findings was that the collocations common to other disciplines occurred with far less frequency in the arts and humanities fields, leading him to conclude that “academic collocations are far less important for students in the arts and humanities than they are for students in other areas” (Durrant, 2009:165). Following this finding, Durrant recommends that the vocabulary needs of arts and humanities students are treated separately from those of other disciplines as this will increase the likelihood of creating academic word lists that are applicable across different subject areas.

Durrant’s study was based on two-word collocations on the grounds that, as the length of *n*-grams increases, frequency decreases and, as with technical terms, they are more likely to be less broadly applicable across different disciplines. However, he notes that two-word collocations tend to be polysemous. Similarly, in support of Hyland and Tse’s (2007) critique of the AWL, Gardner (2007) argues that high frequency words tend to be the most polysemous, having a number of different meanings. Given the argument that polysemous words are dependent on the words associated with them for their meaning, Gardner questions the applicability of computerised counts of individual word forms. Expanding on this question, Gardner (2007:255) considers that formulaic sequences “raise serious questions regarding the linguistic and psychological validity of corpus-based studies that rely primarily on frequency counts of single word forms”. In conclusion, Gardner recommends that the construct ‘word’ be reviewed for the purposes of corpus-based research. The development of a list of formulaic sequences along the lines of the Academic Word List is discussed in the section on the psychological validity of lexical bundles (§2.3.6.1).

This review of the literature on academic vocabulary now turns to some of the measures developed to test vocabulary proficiency.

2.2.3 Assessing vocabulary proficiency

Working on the assumption that vocabulary proficiency serves as a predictor of academic performance, and that computer-based assessments of vocabulary are easy to administer, Morris and Cobb (2004) used Cobb's (2002) Vocabprofiler to measure the vocabulary of learners at different frequency levels. In addition to high frequency words and words from the AWL, this program listed function words such as articles, prepositions and pronouns. The function words were added to test a finding that there is a positive correlation between use of function words and learners' academic proficiency in that "the higher their proficiency level, the greater their reliance on function words" (Morris and Tremblay, 2002, as cited in Morris and Cobb, 2004:77). More specifically, Morris and Tremblay found that the most proficient students' use of function words ranged from 53% to 60% – an increase of between 8% and 15% on the average of 45% typically found in academic writing by native speakers.

However, in contrast with Morris and Tremblay's results regarding function words, Morris and Cobb's (2004) findings were less persuasive on the key role of these grammatical items as they found a correlation of only $r = 0.34$ between function words and students' grades on the pedagogical grammar course as opposed to the slightly higher correlation of $r = 0.37$ found between academic vocabulary and grades on the grammar course (2004:82). With regard to the relationship between vocabulary and academic performance, Morris and Cobb found that, although the correlations between these variables were not high, they were nevertheless statistically significant (2004:86). They concluded on the basis of their results that, while the Vocabprofiler cannot function independently as an assessment instrument of academic proficiency, it could be used in conjunction with reference to more traditional forms of assessment, such as entrance interviews and academic records. Despite the conclusion that the correlation between vocabulary proficiency and academic performance is not sufficiently strong for one to be able to rely on vocabulary assessments alone as a measure of academic competence, Morris and Cobb nevertheless argue that knowledge of academic words is key to academic success for L2 students at the tertiary level. They argue, therefore, that further research is required regarding "the assessment potential offered by vocabulary profiling ... [and] the role of word knowledge in the representation and transmission of ideas" (2004:86). This argument relates directly to the aims of my own research, thereby providing further motivation for my study.

In addition to Cobb's (2002) Vocabprofiler, Nation's (1990) Vocabulary Levels Test and Laufer and Nation's (1999) test of productive ability are discussed in this section as these vocabulary tests are employed in my study. Cobb's (2002) Vocabprofiler is used to measure the frequency

of occurrence of words from the AWL in the student corpus in order to investigate the capacity of academic vocabulary as against lexical bundles to predict academic performance. The results of this word frequency analysis are compared to students' performance on two vocabulary tests, the first of which is the Vocabulary Levels Test. This test of receptive vocabulary, originally designed by Nation in 1983 (Nation, 1990), provides an estimated measurement of vocabulary size that focuses on breadth rather than depth of word knowledge, and was revised and validated by Schmitt, Schmitt and Clapham (2001). This test has five sections, each corresponding to a different frequency level, including words from the AWL which come between the 3000 and 5000 frequency levels. The structure of the test is based on an assumption of implicational scaling, that is, that "knowing lower-frequency words tend[s] to imply knowing higher-frequency ones" (Schmitt et al., 2001:56).

The second vocabulary test used in my study is Laufer and Nation's (1999) test of productive ability, designed to test the learner's ability to use a word when required to do so, either within a restricted context such as a gap-fill activity or in an unrestricted context such as the creation of a sentence to illustrate the word's meaning. Laufer and Nation's (1999:44) study served to confirm the validity, reliability and practicality of the Productive Vocabulary Levels Test as a measure of vocabulary development. The results of a series of productive vocabulary tests showed a gradual increase in the scores on successive frequency levels as the academic proficiency of the test taker increased, as well as a gradual decrease in scores commensurate with the decrease in frequency levels, thereby indicating that the test may be regarded as a valid measure of vocabulary growth. Reliability was measured by comparing the scores of four different versions of the test. An analysis of the results showed that all four versions discriminated between learners of different proficiency levels, and that correlations of scores across the different tests were found to be significant. In terms of the practicality of the productive test, Laufer and Nation (1999:41) argue that "it is easy to administer ... can be completed in a short time ... is easy to mark as there is only one correct word for each item", and simple to interpret as it provides a general indication of the number of words known at each frequency level. The results of the productive vocabulary test completed by the participants of my study are contrasted with the results of the receptive Vocabulary Levels Test. The aim of this comparison is to determine which of the two tests correlates more strongly with academic performance, and so whether the academic vocabulary component of either of these tests could be used as a predictive measure of academic performance.

2.2.4 Academic vocabulary and language proficiency

A primary motivation for the development of the AWL was that it should enable teachers to provide specific guidance for learners working with academic texts (Coxhead and Byrd, 2007). These authors argue that learning an item from the AWL means not only learning the dictionary definition, but understanding the lexico-grammatical features (cf. the discussion of function words in §2.2.3) as well as appreciating the context in which it is used (Coxhead and Byrd, 2007:143). The importance of helping learners come to grips with academic vocabulary is underscored by Coxhead and Nation in their argument regarding text coverage during reading comprehension:

Knowing the 2000 high frequency words and the AWL will give close to 90% coverage of the running words in academic texts. When this is supplemented by proper nouns and technical vocabulary, learners will approach the critical 95% coverage threshold needed for reading.

(Coxhead and Nation, 2001:260.)

The percentage of coverage estimated as necessary for a reasonable comprehension of texts is currently under dispute, although there are findings to suggest that a 98% coverage is required for “unassisted comprehension of a fiction text” (Hu and Nation, 2000:403). In a study to determine what coverage is required for comprehension, Hu and Nation investigated the effect of unknown vocabulary on reading comprehension by assessing comprehension rates of texts with differing proportions of unknown words.

For the purposes of Hu and Nation’s study, a single text was altered by replacing the appropriate number of low frequency words with nonsense words to ensure they were unknown, thereby testing the impact of four different percentages of text coverage on readers’ comprehension (80%, 90%, 95% and 100%). All participants completed the Vocabulary Levels Test and were only included in the experiment on obtaining a minimum score of 77% for the 2000 word level, and 55% or higher for the 3000 word level. Participants were then randomly allocated a text with a particular percentage of coverage, and their comprehension of the text was assessed by means of a multiple choice test and a cued written recall test. Hu and Nation found that an 80% coverage rate resulted in uniformly low comprehension scores, while 95% coverage provided an adequate degree of comprehension for a minority of the participants. They concluded that knowing 98% of the words in a text (that is, 1 unknown word in 50) provides sufficient coverage to ensure that fictional texts can be read with ease. This premise is supported by Carver (1994), who suggests that even a 98% coverage does not necessarily

make reading comprehension easy, as well as by Nation (2006:79), who calculates that an 8000 to 9000 word family vocabulary is required for 98% coverage of written text.

It seems obvious that vocabulary knowledge should contribute to reading comprehension as one of the key requirements for comprehension is that the reader has an understanding of the words in the text. In support of this assumption, evidence confirming the link between vocabulary knowledge and reading comprehension has been provided by a number of studies (Clark and Ishida, 2005; Cobb and Horst, 2001; and Stæhr, 2008). In a study of the relationship between different aspects of vocabulary knowledge and reading comprehension, Qian (2002:532) found that “for university level ESL speakers and in academic settings, depth and breadth of vocabulary knowledge are closely and positively associated not only with each other, but also with performance on reading tasks for basic comprehension”. Key to Qian’s study is the distinction between breadth and depth of vocabulary knowledge. While breadth of knowledge refers to at least a superficial understanding of the meaning of a number of words, and is the measure commonly used in assessing vocabulary size, depth of knowledge is a reflection of how well the speaker knows a word. This knowledge includes features such as “pronunciation, spelling, meaning, register, frequency, and morphological, syntactic, and collocational properties” (Qian, 2002:515).

A key aspect to reading in a second language is the idea that a language threshold or minimum degree of competence in that language has to be attained before the skills and abilities that exist in the first language can be transferred to the L2 (Cummins, 1979). This threshold hypothesis extends to the ability of language learners to “draw on their L1 reading strategies to deal with L2 texts” (Clark and Ishida, 2005:227). Laufer (1992b:101) argues that this threshold is largely lexical, and proposes that “even learners of mediocre ability can improve considerably in their L2 reading once they have raised their lexical level”. In a study designed to investigate the vocabulary differences between two types of students registered for an EAP reading course, Clark and Ishida (2005) suggest that L2 learners require a minimum vocabulary of 5000 word families to enable them to transfer their reading strategies from the L1 and make use of background knowledge when interpreting texts in the L2. These authors propose that simply being exposed to academic texts does not provide L2 learners with adequate means to develop their vocabulary. Without sufficient vocabulary to interpret the meaning of unfamiliar words, L2 learners are unable to reach the comprehension threshold required to understand texts. This is supported by Cooper’s (1999:88) finding that, in a study of the relationship between vocabulary and academic performance, academic vocabulary was the most significant indicator of academic performance as 45 per cent of students who failed the academic vocabulary test failed the year. In this study of vocabulary size among

undergraduate students, Cooper (1999 and 2000b) conducted receptive vocabulary tests based on three levels of frequency: the 1000 and 2000 word lists, the UWL and the advanced word list. An analysis of the results showed that the strongest correlation existed between academic vocabulary scores and academic performance, as measured by the students' examination results. Cooper concludes that a considerable proportion of these L2 students do not have the academic vocabulary required to meet the lexical demands of the reading material on which their studies are based. It is evident that these students require explicit vocabulary instruction if they are to attain the lexical threshold necessary for undergraduate study. Similarly, Santos (2004) states that knowledge of academic vocabulary has been found to distinguish academically well prepared from under-prepared learners, regardless of background. To provide learners with the minimum vocabulary required for comprehension, Clark and Ishida (2005) argue for the explicit teaching of vocabulary items, while Hyland and Tse (2007) propose a combination of explicit teaching and incidental learning.

The majority of studies on the effect of vocabulary knowledge within the academic environment have investigated the relationship between vocabulary proficiency and reading comprehension (Carver, 1994; Clark and Ishida, 2005; Cobb and Horst, 2001; Hu and Nation, 2000; Laufer, 1992a and 1992b; Nation, 2006; Qian, 2002; Santos, 2004; Stæhr, 2008). Far fewer have examined the link between vocabulary proficiency and overall academic performance (Cooper, 1999 and 2000b; Morris and Cobb, 2004; Scheepers, 2014), which is the primary objective of the current study. Given the evidence that a good knowledge of academic vocabulary in particular is essential for success at the level of tertiary education, it is anticipated that the results of my study may contribute to the question of what the specific vocabulary needs of undergraduate students are within the university context.

The question of how best to equip students with the vocabulary they need to comprehend and produce academic texts within the field of psychology applies not only to individual academic vocabulary items, but also more broadly to formulaic sequences such as lexical bundles, which are discussed in the following section.

2.3 Lexical bundles

In the course of this introduction to lexical bundles, I provide a definition of the term, list examples of other terms used to refer to various types of word combinations, outline the key distinguishing feature used in the identification of bundles, distinguish between bundles and collocations, introduce the concept of bundles as discourse frames, and outline the impact of appropriate and inappropriate uses of bundles within the university context.

Lexical bundles are defined as groups of words that commonly co-occur across a range of texts (Biber et al., 1999). Consequently, the primary features used in their identification are frequency and distribution criteria. Lexical bundles are also widely regarded as being semantically transparent rather than idiomatic in meaning, and as not always adhering to traditional grammatical conventions in that they regularly cross grammatical boundaries. A frequently occurring bundle, for example, is 'prep + NP' (*in the case of*) (Biber, Conrad and Cortes, 2004:377).

A range of terms has been used to refer to such commonly occurring groups of words, including 'formulaic sequences', 'prefabricated sequences/patterns', 'multi-word expressions', 'formulaic expressions', 'fixed expressions', 'lexical phrases', 'lexical clusters', 'lexical chunks', 'lexical bundles', '*n*-grams' and 'constructions' (Biber et al., 2004; Biber and Barbieri, 2007; Chen and Baker, 2010; Simpson-Vlach and Ellis, 2010; Stubbs, 2007; Wray, 2002). The key feature that distinguishes lexical bundles from other multi-word sequences is that bundles are defined solely in terms of frequency of occurrence (Biber et al., 2004) as they are typically identified by means of a computer program designed to single out from a large amount of text particular clusters of words that meet the specified criteria with regard to frequency and distribution. Hyland (2008a:44) describes bundles as being "identified empirically purely on the basis of their frequency rather than their structure". As the identification criteria generally require a large body of electronic text, practically all studies of lexical bundles are based on corpora and so fall into the field of corpus linguistics. Within this context a corpus may be defined as "a collection of (1) *machine-readable* (2) *authentic* texts (including transcripts of spoken data) which is (3) *sampled* to be (4) *representative* of a particular language or language variety" (McEnery, Xiao and Tono, 2006:5). In line with McEnery et al.'s (2006:7-8) position, corpus linguistics is viewed in this study as a methodology rather than a separate branch of linguistics on the grounds that it has a wide range of applications to areas of linguistic research such as second language learning.

The principles underlying the process used to identify lexical bundles within a corpus are discussed below (§2.3.3). In the course of this study, commonly occurring three-, four- and five-word sequences are referred to as lexical bundles.

Crossley and Salsbury (2011:3) distinguish lexical bundles from collocations on the basis that collocations are combinations of two or more words "that are consistently found together" but are less rigidly ordered than the words within a lexical bundle. Although less formulaic than idioms, collocations differ from the greater proportion of lexical bundles in conforming to

established syntactic patterns, for example, ADJECTIVE + NOUN: *easy-going personality, formal attire, official complaint*, and ADVERB + ADJECTIVE: *desperately lonely, utterly bereft, absolutely marvellous*. Collocates comprise a head word or “pivot word” (Shin and Nation, 2008:341) as well as one or more collocates which are extensions of the head word in the sense that they collectively form a meaningful unit. One of the primary features of collocations is that the word order of collocates is variable so they do not need to be immediately adjacent to each other to convey the same meaning, for example, *She devised an **ingenious method** to reduce time spent cooking. / The **method** she devised to reduce time spent cooking was **ingenious***. In contrast, lexical bundles always appear as contiguous units (Ädel and Erman, 2012), thereby serving an essential discourse role in providing “building blocks of coherent discourse” (Hyland, 2008a:44). In other words, because “they usually consist of the beginning of a clause or phrase plus the first word of an embedded structure,” (Biber et al., 2004:399), for example, *what I want to, it is necessary to, in the case of*, they function as “discourse frames” which provide a “slot” for new information (Biber, 2006; Biber and Barbieri, 2007). These frames then provide the scaffolding in terms of which the function of the new information can be predicted and so more easily interpreted. In line with this view, Csomay and Cortes (2009) and, in a similar study, Csomay (2013), found that lexical bundles serve as indicators of macro-level changes within the text. For example, the use of stance bundles such as *I want you to* are predominant during the opening of a university class, while referential bundles such as *going to talk about* and *at the end of* become more frequent during the instructional phase (Csomay, 2013:369). Following from this, Cortes’ (2013) study of the functions of lexical bundles in the introduction to research articles reinforces the argument that lexical bundles provide structure within clauses as she found that bundles act as “triggers” at the start of a clause when they introduce the topic (e.g. *the purpose of the present study, it has been shown that, little is known about the*), and as “complements” in the second part of the clause when they “add commentary” (e.g. *in the sense that, the value of the, can be used to*) (Cortes, 2013:40-41). One of the key distinctions between collocations and lexical bundles, that of variable as opposed to fixed word order, clearly forms the basis in terms of which lexical bundles appear to be sufficiently constant to serve as discourse frames in this way, and thereby provide scaffolding for new information.

Apart from differences in the degree of flexibility of word order, a further distinction between collocations and lexical bundles is that bundles in particular are regarded as register-specific since they differ across modes (i.e. spoken discourse vs written texts), genres (e.g. student writing vs published writing) and disciplines (e.g. psychology vs linguistics) in both form and function (Biber et al., 2004; Cortes, 2004; Hyland, 2008b; Jablonkai, 2009; McEnery et al.,

2006; Pang, 2010)⁵. As an example of this, the majority of bundles in academic writing tend to be based on noun phrases (*the results of the, the fact that the, a large number of*) and prepositional phrases (*in the case of, at the end of, on the basis of*), while the majority of lexical bundles in spoken discourse are based on verb phrases (Biber, et al., 2004). More specifically, Hyland (2008b:11) found that the lexical bundles typical of “soft knowledge fields”, such as applied linguistics, reflect the more discursive, exploratory nature of arguments, while the science and engineering texts employed more bundles that served locative and logical functions, suggesting considerable variation across disciplines. The distribution patterns of lexical bundles can therefore be used to distinguish between disciplines:

These bundles are familiar to writers and readers who regularly participate in a particular discourse, their very ‘naturalness’ signalling competent participation in a given community. Conversely, the absence of such clusters might reveal the lack of fluency of a novice or newcomer to that community.

(Hyland, 2008b:5.)

Thus, competent, ‘natural’ use of lexical bundles signals or reflects integration into a particular discourse community, and marks the user as having a degree of proficiency well beyond that of the novice. From this point of view, Hyland (2008b:5, 8) concludes that the expectations around learners within a particular discourse community include evidence of the ability to use the lexical bundles specific to that community appropriately. For this reason “disciplinary-sensitive” bundles should be identified for classroom teaching practice as failure to use these bundles in ways similar to those of expert users may impact on success at university (Biber and Barbieri, 2007:284; Hyland, 2008a). In line with Hyland, Cortes (2004:398) argues that the frequent use of lexical bundles “seems to signal competent language use” within the academic community. Cortes (2004:420) found that students often use lexical bundles to convey functions different from those conveyed by published writers, and so recommends that frequently occurring lexical bundles are explicitly taught in order to raise students’ awareness of both form and function. This argument provides strong motivation for further studies into both appropriate and idiosyncratic or non-standard use of lexical bundles across a range of disciplines. My own study aims to add to the body of knowledge on what is regarded as appropriate use in the field of psychology, using published writing in the field as the benchmark, while also investigating student writing, which includes idiosyncratic uses.

⁵ It is clear that a fair amount of research has been conducted to date on the occurrence of 3-, 4- and 5-word lexical bundles across different registers. In order to argue convincingly that lexical bundles are more register-specific than collocations, contrasting research on the occurrence of collocations across registers is required.

A key distinction in this study is the difference between genre and topic. While topic refers to what is being talked about (Brown and Yule, 1983:38), genre may be defined as “a set of texts that share the same socially recognised purpose and which, as a result, often share similar rhetorical and structural elements to achieve this purpose” (Hyland, 2009b:245). It should be recognised that, in the context of this study, genre and topic differences between the student and published corpora⁶ are inevitable, and that these differences need to be considered when selecting lexical bundles for comparison.

The remainder of this section on lexical bundles (§2.3.1 to §2.3.7) presents an overview of those studies directly relevant to my own, starting with a brief history of the early studies into multi-word sequences, and moving on to the first investigations into lexical bundles. Specific issues surrounding lexical bundles are then dealt with in more detail. Firstly, the use of corpora as a means of identifying lexical bundles is discussed (§2.3.2) in the context of issues such as corpus size, inductive versus deductive approaches and tagging. A range of studies on various aspects of lexical bundles is then considered, looking at their use in spoken and written modes, across university registers, across different academic disciplines, by students as opposed to published writers, and by L1 versus L2 speakers. Aspects of methodology in these studies such as the analysis of the form and function of lexical bundles, duration of the study, and discrepancies in findings are discussed in relation to my own research.

The section following this overview of related studies presents an account of the methodology used to analyse lexical bundles (§2.3.3), including a breakdown of the identifying features of bundles, computer programs used in analysis, and the process of normalisation as means by which corpora of different sizes can be compared, with a discussion of the application of concordance listings. Some of the issues to be taken into account in the development of a corpus, as raised in key research papers on lexical bundles, are described (§2.3.4), and the grammatical features and discourse functions of lexical bundles are discussed in the next section (§2.3.5).

Following the description of structural and functional types, a discussion is presented of the theoretical background in terms of which lexical bundles are interpreted (§2.3.6). Finally, the conclusion (see §2.3.7) presents an overview of the findings of those studies with particular relevance to my research, focusing on classroom applications.

⁶ A full list of essay topics, prescribed reading material and related journal articles for all first-, second- and third-year essays is provided in Appendix A.

2.3.1 Early investigations into lexical bundles

There are some differences of opinion about the earliest studies of multi-word sequences. Cortes (2004:398) dates the initial research into 'lexical co-occurrence' and the origins of the term 'collocation' as early as 1873, when the Oxford English Dictionary referred to the 'collocation' of words in poetry and in prose. According to Hyland (2008b:5), Jespersen investigated types of 'formulaic patterns' in 1924. Firth's (1957, as cited in Hyland, 2008a:42) research on collocations as words that habitually co-occur then served to popularise this term, together with the frequently quoted saying "you shall know a word by the company it keeps".

Biber et al. (2004:373) suggest that Salem was the first researcher to conduct a study of multi-word sequences identified on the basis of frequency, using a French corpus in 1987. Later Altenberg (1998) examined recurrent word combinations in the English London-Lund Corpus. This approach was then adopted by Biber, Johansson, Leech, Conrad and Finegan (1999), who coined the term 'lexical bundles' on identifying multi-word sequences that were "too systematic to be disregarded as accidental" (Biber et al., 1999:290). In their corpus-based study of these lexical bundles across spoken and written registers, Biber and colleagues identified both a range of forms as well as a number of set functions linked to the bundles. This research was ground breaking and so formed the framework for a number of other research projects such as that by Hyland (2008) and Cortes (2004), both of whom built on the methodology used in the Biber study.

Biber et al. (2004:372) identify a number of criteria in terms of which "multi-word units" have been examined in various empirical studies conducted over a span of 20 years, with little consensus on approach. These include the aims of the research, the features used to define the multi-word units, the forms and functions of the units, the size of the corpora from which the units are drawn and the registers. These authors argue from this that the issues around multi-word units are highly complex, and that "the overall importance of multi-word units in discourse can be fully understood only by undertaking empirical research studies from different perspectives" (Biber et al., 2004:372). This argument provides motivation for my study of lexical bundles using a corpus focused specifically on one discipline within the social sciences, psychology, which provides an in-depth perspective on student writing as collected over three years. As a longitudinal study, it should also cast light on whether and to what extent students' use of lexical bundles changes during the course of an undergraduate degree.

2.3.2 Studies of lexical bundles

Underlying all studies into lexical bundles is the expectation that the research is based on a large body of electronic text which is analysed by means of a computer program. Given that bundles are made up of specific combinations of words, they are commonly identified by means of an inductive process based on frequency of occurrence, a method of identification that demands a fairly extensive corpus. Sinclair (2004:188-189) argues against the use of small corpora on the grounds that those features of language which are not superficial can only emerge from the study of a body of text of sufficient size to reveal patterns and regularities in language use. Using the inductive process, the lexical features to be investigated are identified in the course of the analysis of the text, while in a deductive process the lexical features would be pre-defined and then investigated in context. This distinction between 'inductive' and 'deductive' approaches relates to some degree to the distinction between the 'corpus-driven' and 'corpus-based' approaches, as illustrated in Baker's (2006:16) reference to the corpus-driven approach being more inductive than that of the corpus-based approach:

The [corpus-based approach] uses a corpus as a source of examples, to check researcher intuition or to examine the frequency and/or plausibility of the language contained within a smaller data set. A corpus-driven analysis proceeds in a more inductive way – the corpus itself is the data and the patterns in it are noted as a way of expressing regularities (and exceptions) in language.

In addition to his argument regarding corpus size, Sinclair (2004:190-191) disputes the annotation of corpora by the use of tags to mark syntactic features, arguing that the text "loses its integrity" with the addition of tags, and so he defines corpus-driven linguistics as the investigation of "raw", untagged text to establish patterns of language use. The identification of lexical bundles within an untagged corpus is discussed in more detail in the next section (§2.3.3).

Having touched on the distinction between the corpus-based and corpus-driven approaches, I would nevertheless like to argue, following McEnery et al. (2006), that the difference between these approaches is far from clear. While the corpus-based approach is said to use corpora to test existing theories, those using the corpus-driven approach claim to have no pre-conceived ideas when analysing a corpus. However, one of the arguments countering the latter claim is that the researcher cannot be viewed as a *tabula rasa*, but would inevitably base any intuitions formed on established linguistic theories.

Given that it is difficult to totally reject and dismiss preconceived theory, and intuitions are indeed called upon in corpus-driven linguistics, it is safe to conclude that there is no real difference between the corpus-driven demand to re-examine pre-corpus theories in the new framework and corpus-based linguists' practice of testing and revising such theories.

(McEnery, Xiao and Tono, 2006:10.)

As mentioned earlier (§2.3), various studies have explored the differences between lexical bundles in spoken and written modes, the different uses of lexical bundles by published writers as opposed to students across a range of academic disciplines, discrepancies in the use of lexical bundles by native and non-native speakers, and aspects of acquisition of lexical bundles. These studies are discussed in turn below, and the relevance of each to this study considered.

Biber et al. (2004) examined lexical bundles in classroom teaching and in textbooks within the university context. These authors developed a taxonomy to describe the functions of lexical bundles in both spoken and written contexts, the primary categories of which included stance expressions, discourse organisers and referential expressions (Biber et al., 2004:384). While stance expressions convey the speaker's or writer's attitude or degree of confidence with regard to a proposition, discourse organisers point to anaphoric and cataphoric relations within the text, and referential expressions relate to objects or concepts, either in part or as a whole. (The functions of lexical bundles are discussed in more detail at a later stage – see §2.3.5.) Biber and colleagues found that there are more stance and discourse organising bundles (such as *I don't know if, it is possible to* and *I want to talk about, if you look at*) in classroom discourse than in conversation, while at the same time more referential bundles (such as *the nature of the, on the basis of*) in classroom discourse than in academic prose, and concluded that lexical bundles are “a unique linguistic construct ... [that] function as basic building blocks of discourse” (Biber et al., 2004:371).

Following on from Biber et al.'s (2004) research, Biber and Barbieri (2007) conducted a study of lexical bundles across university registers. They found that, while bundles occurred to some degree in all forms of university discourse, density of lexical bundles is linked both to mode and to communicative purpose, with bundles occurring most frequently in written non-academic registers. They concluded that the use of particular types of lexical bundles is associated closely with register as various sets of bundles serve different discourse functions. This study raises questions such as which lexical bundles learners acquire naturally through reading and classroom participation, without explicit intervention, as well as whether there are

particular forms and functions of lexical bundles that learners struggle with. Such questions serve as further motivation for my investigation of the production of bundles by students.

Biber and Barbieri's (2007) study is of particular relevance to my own research as the methodology used in the identification of lexical bundles is well detailed, specifically with regard to the operational definition of lexical bundles and the normalisation process used to identify lexical bundles in small corpora. The methodological issues that arise from the investigation of lexical bundles and the way in which these are addressed in other research studies are discussed in the next section on the operationalisation of bundles (§2.3.3).

Another key figure in lexical bundle research is Hyland (2008) who, following Biber and Barbieri (2007), looked at bundles in university registers. Hyland's (2008b) study was more focused, however, investigating the occurrence of lexical bundles across four distinct disciplines (biology, electrical engineering, applied linguistics and business studies). Hyland found that only five of the top 50 bundles (10%) occurred across all four disciplines. On average, ten of the top 50 bundles (20%) occurred across three disciplines, while more than half the bundles only occurred in one discipline. It seems unlikely, given this finding, that a form of the academic word list could be drawn up for lexical bundles. Nevertheless, this has been an area of research pursued by Byrd and Coxhead (2010), as discussed below.

In the course of his analysis of the functions performed by lexical bundles, Hyland provides support for the argument that both the form and function of bundles vary according to discipline. As an example, he found that the type of bundles in applied linguistics and business studies were predominantly text-oriented, reflecting "discursive and evaluative patterns of argument" as opinions are expressed in an interpretive rather than empirically-based style (2008b:16).

Cortes (2004) identified lexical bundles in a corpus of history and biology journals and then, in a more deductive approach, compared the use of these 'target bundles' by academic writers to their use by students. She found firstly that student writers used the target bundles far less frequently than did published writers, and secondly that, when they were used by students, their functions often did not correspond to those in the journals. Cortes (2004:398) suggests that there are still a number of unanswered questions about the use of lexical bundles across different registers, and the extent to which the writing of published authors differs from that of students across disciplines. Speculating on the far greater use of lexical bundles by published writers than by students, Cortes (2004:421) proposes that students may be avoiding the use of bundles on the grounds that they feel more confident using alternative expressions to convey the same function as there is less likelihood of their making a mistake. For example, they may

elect to use an adverbial form such as *alternatively* rather than the bundle *on the other hand*, *probably* rather than *is likely to be*, or the conjunction *because* rather than *can be explained by*. As the question of whether and, if so, to what degree, the lexical bundles used by students differ in structure and function from those used by published writers, Cortes' viewpoint regarding the need for further research serves to provide further motivation for my study.

Chen and Baker (2010) compared the occurrence of lexical bundles in published writing against two corpora of student writing – one from first language (L1) speakers of English and the other from second language (L2) speakers. They found that published academic writing “exhibited the widest range of lexical bundles whereas L2 student writing showed the smallest range” (2010:30). More specifically, they found that student writers overused certain lexical bundles not commonly found in published academic text, with a predominance of VP-based bundles a particular feature of immature writing, while at the same time not making use of bundles that might be expected to be familiar as they occur with high frequency in published writing. The fact that the greatest range of bundles (both in terms of number and in terms of variety) occurred in the published corpus contradicts Hyland's (2008a) finding that the majority of lexical bundles identified in his study were drawn from student corpora. Hyland argues on the basis of his finding that students are less confident writers, and so need to rely more on formulaic sequences. However, since research by Chen and Baker (2010) as well as by Cortes (2004) showed that published writing contains the highest proportion of lexical bundles, this issue clearly requires further investigation. Nevertheless, a finding common to all three studies is that student writing incorporates considerable repetition of the bundles selected for use.

One of the main aims of Chen and Baker's (2010) study was to investigate lexical bundles in the writing of second-language students. They suggest that, while Hyland (2008a and 2008b) considered the writing of L2-students, these were at Masters' and Doctoral levels. Given their academic proficiency and, correspondingly, their necessarily advanced writing skills in academic discourse, the focus on these postgraduate students would shed little light on the question of how lexical bundles are used by students at lower levels of English proficiency. The focus of Chen and Baker's study was therefore more on problems surrounding the use of lexical bundles by L2 undergraduate as well as postgraduate students. In a comparable study of undergraduate student writing, Ädel and Erman (2012) evaluated the lexical bundles used by L1 speakers of English and L2 speakers whose mother tongue was Swedish. They found L1 speakers to have access to a larger range of bundles, with the result that there was significant difference in the type/token measures between L1 and L2 speakers. As with Chen and Baker's (2010) study, the types of bundles used by L1 speakers showed a greater maturity in the level of writing, including the use of unattended *this* (where the determiner is not

accompanied by a head noun, e.g. *this can be seen* – as opposed to *this topic*), existential *there* (e.g. *there appears to be*, *there is evidence of*), passives and hedges, while the instances of anticipatory *it* used by L2 speakers tended to be suited to an informal rather than academic register as basic adverbs were used as content words to fill the slots, for example, *it is easy to*, *it is hard to* (Ädel and Erman, 2012:87, 90).

Allen (2009) compared the accuracy, grammatical structures and functions of lexical bundles in learner writing with L1 student writing and published writing, and found considerable convergence in the use of bundles across the three corpora. To a certain extent, this may be explained by the revision and editing processes applied to the texts in the learner corpus (Allen, 2009:119). As with Hyland (2008a), the influence of editing by native English speakers on the learner corpus may have altered the patterns of typical lexical bundle use by the non-native speakers.

In a longitudinal study of the use of lexical bundles by a single subject that represents one of the few studies of lexical bundles not based on a corpus but on a collection of the student's written assignments, Li and Schmitt (2009) explored the acquisition of lexical phrases by a Chinese Master's student over a period of one academic year. As part of the background to their study, they recognised that "learning to write well also entails learning to use formulaic sequences appropriately" (Li and Schmitt, 2009:86). One of the means used to qualitatively assess the student's writing was to highlight lexical phrases, identified by means of "proficient speaker intuitions", and ask informants to judge them on a scale from 'very appropriate' to 'not appropriate' (Li and Schmitt, 2009:89-90). Their primary finding was that, although the student's command of lexical phrases increased over the course of the year, her use was nevertheless restricted to a limited range of phrases, with the result that she tended to overuse a few formulaic sequences. In addition, feedback given by markers seemed to suggest that "the appropriate and diverse use of lexical phrases does have an effect on the evaluation of the academic writing" (2009:98-99). This research relates to my own study, firstly, in describing a qualitative method by which to assess idiosyncratic uses of bundles by L2 students and, secondly, in proposing that there is a relationship between the use of lexical bundles and the assessment of writing in the academic context, based on tutors' comments. For example, it was suggested that the student should use simple linking devices to create more coherent writing, such as *in addition* or *furthermore* instead of the phrase *on the other hand*, which was often used inappropriately (2009:98). This is a key issue that has not been explored in any depth and which warrants further investigation. Should it be found that students' use of lexical bundles has a significant impact on their academic performance, then arguments for the teaching of such bundles would gain substantial ground.

Researchers have also explored ways to make it easier for students to acquire lexical bundles. Following the development of the Academic Word List by Coxhead (2000), Byrd and Coxhead (2010) collaborated to identify four-word bundles that occurred with a high degree of frequency across four different disciplines. The aim was to provide undergraduate students with a list of lexical phrases that were common to a number of academic disciplines and so were likely to be encountered in the course of readings. If students could be introduced to these phrases at the start of their undergraduate studies, this would reduce the likelihood of their struggling to interpret texts as a result of a high percentage of unknown lexical phrases. Byrd and Coxhead (2010) argue that English texts contain a wide range of formulaic language including lexical bundles, idioms, collocations and phrasal verbs. As a result of this diversity, students are unlikely to come across lexical bundles sufficiently frequently to become familiar with them through repeated encounters. Students' attention should therefore specifically be drawn to the more commonly occurring lexical bundles in order to raise their awareness of these forms and the functions they perform. Hyland (2008b), however, argues against the common list of bundles on the grounds that lexical bundles perform different roles in each discipline and so cannot be assumed to function in the same way across the various disciplines. Hyland (2008b:7-8) warns against making generalisations about academic bundles and instead encourages the development of a "disciplinary-sensitive" selection of bundles which will raise students' awareness of the types of bundles most likely to occur in their fields of study.

One of the common threads that links together a number of the research studies into lexical bundles is the closing argument that lexical bundles are not likely to be easily acquired just through exposure to either spoken discourse or written texts, and so need to be taught (Byrd and Coxhead, 2010; Cortes, 2004; Hernández, 2013; Karabacak and Qin, 2013; Pang, 2010). Biber and Barbieri (2007), while considering lexical bundles suitable candidates for explicit tuition, argue that further research is required to investigate the degree to which lexical bundles are assimilated as part of the natural learning process, without overt intervention. However, Cortes (2006) found no significant difference in the use of lexical bundles by students who had been given explicit guidance on their structures and functions. Although the students indicated a greater awareness of lexical bundles following the workshops, they continued to favour simple conjunctions and adverbs to express the functions performed by lexical bundles in published writing. In the conclusion to her study, Cortes (2006:401) proposes that a longitudinal study is required to investigate "formulaic language development".

A longitudinal study of lexical development was conducted by Crossley and Salsbury (2011) over a period of one year during which they observed six L2 speakers, monitoring the participants' acquisition of bigrams (two-word bundles). One of the assumptions underlying this

study is that “the inaccurate use of multi-word lexical units is a strong indicator of non-native speech” (Crossley and Salsbury, 2011:4). They therefore argue that the use of lexical bundles can be considered a measure of more general lexical competence on the grounds that word knowledge is linked to an understanding of what possible combinations within the lexical network are acceptable. They found that the participants’ understanding of and ability to produce accurate bigrams in appropriate contexts developed over the course of the year, suggesting that the development of lexical networks is directly related to the development of more general language competence.

My own study aims to address the question of lexical development over an extended period by conducting a predominantly quantitative analysis of the lexical bundles used by L1 and AL students from their first year to their third year of undergraduate study, with this approach strongly advocated by Cortes (2004:215):

The only reliable way to identify patterns of development in the use of lexical bundles by students at different levels would be to conduct a longitudinal study of the same students investigating the evolution in the production of target bundles in their writing.

As mentioned in the conclusion to the discussion of Li and Schmitt’s (2009) study, one of the unresolved issues currently surrounding lexical bundles is the question of whether there is a relationship between perceptions of proficiency and the number of lexical bundles used in a text. An additional issue is whether there are variations in the use of lexical bundles by native and non-native speakers of English. As a result of differences in corpus size and methodology, the findings on both issues have not yet proved conclusive (Ädel and Erman, 2012; Chen and Baker, 2010; Cortes, 2004; Hernández, 2013; Hyland, 2008a). With regard to the issue of the difference between L1 and L2 speakers’ use of bundles, any discrepancies in findings may be due to the ESL/EFL difference as Chen and Baker (2010), whose study was based on Chinese students in the United Kingdom, found little difference, while Ädel and Erman (2012), whose Swedish participants were based in Sweden, found considerable variation in their use. It is hoped that my study sheds further light on this issue.

The majority of studies discussed in this section describe in considerable detail the corpus on which each study is based and how this corpus was compiled. This detail is essential to any corpus-based study as the nature of the corpus influences the type of lexical bundles that occur within the text and so is important in determining the structures and functions of the lexical bundles. The key features of the methods employed in these research studies are outlined in the next section, with reference to their applicability to my study.

2.3.3 Operationalisation of lexical bundle analysis

Reviewing the methodology used by researchers to analyse lexical bundles reveals that the issues that commonly arise in the identification of lexical bundles are frequency, distribution, number of words in the bundle and grammatical structure. These features are described in this section, and their role in the analysis of corpora considered. In addition, this section discusses software used in the analysis of bundles, outlines the process of normalisation applicable when dealing with corpora of various sizes, and refers to one of the main statistical methods applied to the assessment of lexical bundles within corpora (i.e. Chi-square).

In view of the fact that lexical bundles have been defined as “the combinations of words that ... recur most commonly in a given register” (Biber et al., 1999:992), frequency of occurrence is key to any study of lexical bundles. In the 1999 study by Biber and associates, the frequency cut-off was 10 times per million words. In other words, multi-word sequences that occurred at least 10 times in a corpus of one million running words were regarded as lexical bundles. This number ranges, however, from 20 to 40 occurrences per million words (Biber et al., 2004; Hyland, 2008b).

While frequency is a key identifying feature of bundles, other features must also be considered in conjunction with rate of occurrence. As a framework for the description of the methodology used in their research, Biber et al. (2004) set out the following criteria in terms of which they identify lexical bundles:

- a. Frequency of occurrence – a minimum occurrence of 10 times per million words (with a statistical conversion to equivalent ratio for smaller corpora)
- b. Distribution or ‘dispersion threshold’ – sequences to occur in at least five different texts in order to guard against idiosyncratic use by individual writers
- c. Type of bundles – commonly restricted to sequences of four words as these include 3-word bundles in their structures, have a broader range of structures and functions than 3-word bundles, and occur more frequently than 5-word bundles
- d. Grammatical structure – lexical bundles are generally not complete structural units; “most lexical bundles bridge two structural units: they begin at a clause or phrase boundary, but the last words of the bundle are the first elements of a second structural unit” (Biber et al., 2004:377), with the result that “shorter bundles are often incorporated within longer lexical bundles” (Nekrasova, 2009:650). This is a feature which Chen and Baker (2010:33) identify as occurring in two forms: “complete overlap” and “complete subsumption”, as discussed later in this section.

- e. Semantic transparency or “perceptual salience” (Biber and Barbieri, 2007:264) – bundles are not idiomatic in meaning; it is possible to determine the meaning of a lexical bundle from the individual words that make up the multi-word sequence.

Biber and Barbieri (2007) present a detailed explanation of the analysis of lexical bundles within their corpus. This description of the process used to identify four-word sequences, check each sequence against previously occurring sequences, and conduct a running frequency count of each sequence provides the basis for the identification of lexical bundles in my own study. These authors state that “only uninterrupted sequences of words were treated as lexical bundles” (Biber and Barbieri, 2007:268), so that any words spanning a punctuation boundary were not included in the count.

One of the most regularly used computer programs for the analysis of lexical bundles is WordSmith Tools (Scott, 1996). However, to identify these items in her study, Cortes (2004) used a lexical bundles program designed by Borland Delphi (1998, in Cortes, 2004:403). In addition, a second program, ‘MonoConcPro’, designed by Barlow (2002, in Cortes, 2004:404) was used to identify the functions performed by the bundles, and to identify the occurrence of ‘target bundles’ in the student corpus. The reason Cortes (2004) used these programs rather than WordSmith Tools is that they are better at recognising punctuation markers and so have a higher probability of disregarding sequences of words that contain punctuation (*personal correspondence*: 20-10-2011). The analysis in my study was conducted by means of WordSmith Tools 6.0 (2012). This updated version now provides the option to recognise punctuation symbols such as apostrophes and hyphens within words. This program is described in more detail in Chapter 3.

A primary issue within corpus linguistics is the comparison of corpora of different sizes. This is dealt with through the use of concordancing and normalisation, both of which are discussed here. As a result of the relatively small size of the different sections within her student corpus, Cortes (2004) used a qualitative approach to identify lexical bundles. Once the ‘target bundles’ had been earmarked within the corpus of published academic writing, these were identified in the student corpus by means of a concordance program. In discussing problems relating to the frequency of bundles, Cortes (2004) explains that distribution played a key role in her study of small corpora:

Sometimes a bundle seemed frequent, because the number of occurrences was high, but a closer look showed that the bundle was used by only a few students, who repeated the use of the expression several times in the same paper.

(Cortes, 2004:411.)

To address this problem, Cortes (2004:411) provides the overall number of occurrences for each bundle in addition to the number of texts in which the bundle is used.

Similarly, Biber and Barbieri (2007) address the problem of dealing with smaller corpora by providing the formula used to normalise the count of lexical bundles within a corpus. The process of normalisation is applied to texts of different lengths which do not have equivalent numbers of tokens, or 'running words'. This process enables the comparison of different-sized corpora by counting the occurrence of key items, such as the lexical bundle *on the basis of*, as a proportion within a set number of words. The normalisation process therefore compares two or more texts in similarly-proportioned chunks, for example, frequency per thousand words or per million words, using simple arithmetic, as illustrated below.

In another study that required the implementation of the normalisation process for an accurate comparison of lexical bundles, Chen and Baker (2010:32) explain that, as they were dealing with corpora of various sizes, it was necessary to experiment with frequency and range criteria in order to establish the "optimum number of bundles" to be sufficiently representative. These authors propose that it is not possible to apply a standardised threshold across all corpora on the grounds that "when a normalized rate is converted to raw frequencies [in the course of comparing corpora], it substantially affects the number of generated word combinations". To illustrate this, they compare the analysis of lexical bundles in a 40 000-word corpus as opposed to an 80 000-word corpus. If the frequency threshold is set at 40 per one million words, then the converted raw frequency threshold for the smaller corpus is 1.6, while the raw frequency threshold for the larger corpus is 3.2. (The raw frequency is calculated as follows: $(40 \times 40\,000) / 1\,000\,000 = 1.6$; $(40 \times 80\,000) / 1\,000\,000 = 3.2$.) Decimals then have to be rounded up or down to provide an operational cut-off frequency, but this skews the normalised rates, as illustrated below:

... rounding down 3.2 to 3 results in a normalised rate of 37.5 whereas rounding up 1.6 to 2 generates a normalised rate of 50, both of which are different from the originally reported frequency threshold of 40 times per million words.

(Chen and Baker, 2010:32.)

Chen and Baker therefore argue that it is not possible to set the same threshold when comparing corpora of different sizes. To address this problem, they recommend that both “the raw cut-off frequency and corresponding normalized frequency should be reported” (Chen and Baker, 2010:32). While Biber and Barbieri (2007) advocate the use of normalisation in dealing with smaller corpora, they caution that distribution must be considered in addition to frequency to avoid idiosyncratic use of language skewing results: “using different distributional requirements for the different sub-corpus sizes [serves to] normalise the distribution of lexical bundle types for the smaller sub-corpora” (Biber and Barbieri, 2007:269).

Although normalisation is still used as a means of comparing corpora of less than one million words (Chen and Baker, 2014; Jaworska, Krummes and Ensslin, 2015; Staples, Egber, Biber and McClair, 2013), it must be recognised that “the relationship between corpus size, cut-off frequency, and dispersion requires further research” (Chen and Baker, 2014: 6). In comparing corpora of varying sizes, Cortes (2002b) showed that a greater number of lexical bundles were identified in smaller corpora when normalised in relation to larger corpora as a result of the low frequency requirements. “Comparison of bundles yielded by small corpora and large corpora has been shown to be problematic because applying the usual normalization formula results in unreliable figures” (Cortes, 2015: 205). However, as there appears to be no alternative method to compare smaller corpora at present, the use of the normalisation procedure was regarded as unavoidable despite its limitations (cf. Jalali, 2013).

Another feature used by Biber and Barbieri (2007) that is implemented in my study is the application of the type/token distinction used in vocabulary research. As in Chen and Baker (2010:33), these authors distinguished between types and tokens when counting bundles across different corpora as a means of dealing with frequency and distribution problems. The issues surrounding the distribution of bundle types as opposed to tokens are discussed in depth in Biber and Barbieri’s (2007) study, with possible means of addressing aspects of this problem outlined. In essence, while it is possible to normalise 4-word sequences that form lexical bundles per one million words of text when considering their distribution only in terms of frequency, that is, as tokens, the normalisation of different types of lexical bundles is not possible on the grounds that “type distributions are not linear” (Biber and Barbieri, 2007:268). In other words, a normed count of types per 1000 words would always show up as either 1 or 0 as types are not distributed throughout a text but, by definition, either occur once or not at all. This problem is addressed by the application of different distributional requirements according to the size of the corpus. For example, in the Biber and Barbieri study, the occurrence of lexical bundle types was normalised as follows:

In a 50 000 word sub-corpus, the lexical bundle had to occur in three or more different texts.

In a 100 000 word sub-corpus, the lexical bundle had to occur in four or more different texts.

In a 200 000 word sub-corpus, the lexical bundle had to occur in five or more different texts.

(Biber and Barbieri, 2007:269.)

In other words, in order to be recognised as a discrete lexical bundle in a corpus of 50 000 words, the sequence *one of the things*, for example, had to occur in at least three separate source texts. As a result of the problems outlined above with regard to the distribution of types, the focus of my study is on tokens rather than types.

A number of statistical methods are used in the analysis of corpora as further support for arguments regarding relative frequencies of key items. As a quantitative comparison, for example, Chen and Baker used a Chi-square test to identify differences in the use of lexical bundle structures and functions. As a qualitative assessment of the bundles, they examined specific instances in detail, using a concordance. Using this method, they found, for example, that there were fewer instances of hedging expressions in the writing of L2 students. Other features found to be particular to L2 writing were the tendency to overgeneralise and the use of certain idiomatic expressions. Both the Chi-square test and the concordance approach are used in my study to compare the use of lexical bundles by students and published writers, while concordance listings are also used to identify the discourse functions of lexical bundles.

The distinction between the quantitative and qualitative approaches in my study are discussed in more detail in Chapter 3, together with a description of the normalisation process to be used as it is clear from the discussion of normalisation and distribution in this section that smaller corpora present methodological difficulties that require careful consideration.

2.3.4 Developing a corpus

That the validity and reliability of any research based on a corpus is dependent to an important extent on the nature of the corpus is axiomatic. For this reason the development of corpora in other research projects is key to my study, and is discussed in this section.

In order to build a corpus of appropriate published writing suitable for comparison with student writing, Cortes (2004) consulted professors for advice on which journals represented the best writing in their field, and which journals provided the best models for students. This approach was adopted in my own study as psychology lecturers were asked to recommend journals that met these criteria.

In describing the development of her corpus following the collection of suitable material, Cortes (2004:403) states that journal articles were downloaded in electronic format, and “were completely cleaned, that is no titles, headers, footers, captions, scientific formulae, or references were included in the final word count”. In order to ‘clean’ their corpus, Chen and Baker (2010:33) removed proper nouns and context-based bundles such as those containing subject-specific terms. They also merged “overlapping word sequences [which] could inflate the results”. These authors identified two types of overlapping sequences:

One is ‘complete overlap’, referring to two 4-word bundles which are actually derived from a single 5-word combination. For example, *it has been suggested* and *has been suggested that* both occur six times, coming from the longer expression *it has been suggested that*. The other type of overlap is ‘complete subsumption’, referring to a situation where two or more 4-word bundles overlap and the occurrences of one of the bundles subsume those of the other overlapping bundle(s). For example, *as a result of* occurs 17 times, while *a result of the* occurs five times, both of which occur as a subset of the 5-word bundle *as a result of the*.

(Chen and Baker, 2010:33.)

These authors conflated overlapping sequences, representing them with the ‘fifth’ word in the bundle given in brackets, for example, *it has been suggested + (that)* and *as a result of + (the)*. Unlike Chen and Baker (2010:43), who found that more advanced writers used more formulaic expressions, Hyland’s (2008a) research showed that Masters’ students relied more on formulaic expressions than did PhD students or writers of published articles. However, Hyland’s (2008a) exclusion of content-related bundles, proper nouns and ‘overlapping sequences’ may account for the discrepancy between these sources regarding use of bundles by student writers. This issue is discussed again later with regard to discourse functions (see §2.3.5.2), and a detailed account of the process used to build the corpus of psychology texts that forms the basis of my study is provided in Chapter 3.

A common thread that runs through much of the leading research into lexical bundles (Biber et al., 1999; Biber et al., 2004; Chen and Baker, 2010; Cortes, 2002 and 2004; Hyland, 2008a and 2008b) is the analysis of bundles in terms of structural and functional types. The classification systems used in this analysis are presented below, together with examples of textual differences which these types have served to illustrate.

2.3.5 Grammatical and pragmatic features of lexical bundles

The analysis of lexical bundles according to structural types and discourse functions is key to the arguments presented regarding differences in patterns of use across various registers and by writers of varying proficiency levels. The development of these taxonomies and changes to the structural and functional classifications systems are discussed and exemplified below.

2.3.5.1 The structure of lexical bundles

Biber et al.'s (1999) classification system for the structure of lexical bundles has been used in a number of research studies in this area (Allen, 2009; Biber et al., 2004; Byrd and Coxhead, 2010; Chen and Baker, 2010; Cortes, 2004; Csomay, 2012; Hyland, 2008a and 2008b) and is also used in my study, with some adaptations to suit the data (§3.5.2.3b).

Following from the principle that lexical bundles “have strong grammatical correlates, even though they are not usually complete structural units” (Biber et al., 2004:308), the structural type is based on the identification of the primary grammatical element within each bundle, as illustrated in the examples of 4-word bundles in Table 2.1 below:

Structural type	Example
Noun phrase with post-modifier fragment	<i>the nature of the</i>
Preposition + noun phrase fragment	<i>as a result of</i>
Anticipatory <i>it</i> + VP/adjective (+complement clause)	<i>it is possible to</i>
Passive verb + PP fragment	<i>is based on the</i>
(verb +) <i>that</i> -clause fragment	<i>are likely to be</i>

(Biber et al, 1999:996.)

Table 2.1: Structural types of lexical bundles common to academic prose

Biber et al. (1999) initially identified 14 categories of structural types in conversation, and 12 categories of structural types in academic prose, with some overlap between the two sets. Biber et al. (2004:380) then regrouped these categories into three main types according to core grammatical features, either clausal (Types 1 and 2) or phrasal (Type 3): Type 1 comprises verb phrase fragments (e.g. *it's going to be, you know this is*), Type 2 comprises dependent clause fragments (e.g. *I want you to*) in addition to simple verb phrase fragments beginning with a complementizer or a subordinator (e.g. *if we look at, to be able to*), while Type 3 comprises noun phrase or prepositional phrase fragments (e.g. *the end of the, of the things that*), in addition to comparative expressions (e.g. *as well as the*). Although Biber et al.'s (2004:381) revision to the structural categories initially developed in 1999 is based simply on three major grammatical classes (i.e. VP, NP and PP), it contains a number of sub-types,

adding up to 17 structural categories in total. The taxonomy employed for the analysis of structural types in my study is taken from Hyland's (2008b) adaptation of Biber et al.'s (1999) system on the grounds that he employs fewer structural categories than either Biber et al. (1999) or Biber et al. (2004). As a result of the reduced number of types, the categories employed by Hyland (2008b) are slightly broader and therefore more adaptable than those of Biber et al. In addition to this greater degree of flexibility, and, as with his functional types (see §2.2.5.2), Hyland's structural categories are more characteristic of academic writing than of spoken discourse, as illustrated below:

- | | |
|---|---|
| ➤ Noun phrase + of | <i>(the end of the, a large number of)</i> |
| ➤ Other noun phrases | <i>(the fact that the, one of the most)</i> |
| ➤ Prepositional phrase + of | <i>(at the end of, as a result of)</i> |
| ➤ Other prepositional phrases | <i>(on the other hand, at the same time)</i> |
| ➤ Passive + prepositional phrase fragment | <i>(is based on the, is defined as the)</i> |
| ➤ Anticipatory it + verb/adj | <i>(it is important to, it is possible that)</i> |
| ➤ Be + noun/adjectival phrase | <i>(is the same as, is a matter of)</i> |
| ➤ Others | <i>(as shown in figure, should be noted that)</i> |
- (Hyland, 2008b:9.)

In their analysis of structural types, Biber et al. (2004) found that almost 90% of the lexical bundles in conversation were clausal in that they incorporate a verb phrase (*I don't want to, we're going to do*), while the majority of bundles in academic prose are phrasal (*as a result of, on the basis of*), suggesting strong links between the structures of lexical bundles, spoken and written modes, as well as formal and informal registers. Similarly, Cortes (2004) established that academic writing contains more phrasal bundles than conversation, and is marked for post-nominal modification in, for example, the use of genitives and prepositional phrases. Hyland (2008a) provides further support for the argument that types of bundles are clearly linked to register by providing additional examples of bundles characteristic of academic writing as opposed to conversation. He identifies the grammatical features of 70 per cent of bundles found in written academic discourse as

preposition + noun phrase fragments (*on the basis of, in the case of*), noun phrase + *of*-phrase fragments (a wide range of, one of the most) as well as anticipatory *it* fragments (*it is possible to, it is clear that*) ... [while] 60% of patterns [in conversation] are personal pronoun + lexical verb phrases (*I don't know what, I thought it was*) and auxiliary + active verb (*have a look at, do you want a*).

(Hyland, 2008a:44.)

In addition to the frequent use of anticipatory *it* in academic discourse, Hyland (2008a) argues that there is a predominance of agent-evacuated passives (*is based on the, can be found in*) and post-nominal modification (*the fact that the, the extent to which*) in contrast to spoken discourse, reflecting the need to present well-substantiated, fairly tentative arguments in academic discourse.

As indicated above (§2.3.2), Chen and Baker (2010:34) also based their analysis of structural types on the taxonomy developed by Biber et al. (1999), with slight modifications in that they classify bundles in terms of three broad categories, that is, NP-based, PP-based and VP-based. The NP-based bundles are divided into two subcategories – noun phrase fragments with *of* (*in the context of*) and noun phrase fragments without *of* (*the way in which*) – with the second subcategory (i.e. without *of*) commonly forming the basis of relative clauses. Both NP + *of* (*the ___ of the*) and PP + *of* (*in the ___ of*) serve as highly productive frames in that the gaps can be filled by a number of options such as *end, rest, nature, role* and *size* following the noun phrase, and *case, context* and *form* following the prepositional phrase.

In their investigation into student and published uses of structural types, Chen and Baker (2010:36-37) found proportional differences between novice and expert writing in that both L1 and L2 students used NP- and PP-based bundles far less frequently than published writers, as the students tended to rely far more on VP-based structures in their writing. In addition, they found that L2 students generally used more ‘*to*-clause fragments’ (e.g. *in order to understand*) and made far less use of the construction ‘passive verb + prepositional phrase’ (e.g. *be taken into account*) than their L1 peers.

One of the features of student writing to be examined in my study is the degree to which the structural forms of lexical bundles used by students conform to the trends in academic prose outlined above.

2.3.5.2 Discourse functions of lexical bundles

While the analysis of structural types is based on grammatical features, and so is relatively straightforward, with little dispute around the classification of types, the categorisation of discourse functions is dependent on the assessment of semantic and pragmatic features in that the bundles are grouped according to meaning and purpose. As a result, the identification of functional categories and allocation of bundles to these categories is a high-inference procedure which has led to a certain degree of contestation.

According to Cortes (2004:400), a taxonomy of functional categories was initially generated by Cortes in 2001 for the purposes of her doctoral dissertation which focused on lexical bundles in academic prose in the disciplines of history and biology. For example, as part of her functional taxonomy, Cortes included a fairly discipline-specific subcategory of statistical bundles typically used to report the results of studies in biology, as well as the more general referential subcategories ‘referential subject-bound’ (e.g. *in the history of*) and ‘referential quantifying’ (e.g. *as part of a, the rest of the*) (2004:405; 408). Cortes’ (2002b) categories were then further refined by Biber, Conrad and Cortes (2004), and this revised taxonomy has served as the model for a range of different studies on lexical bundles and other types of formulaic sequences (Ädel and Erman, 2012; Biber and Barbieri, 2007; Chen and Baker, 2010; Cortes, 2004 and 2006; Csomay 2012; Nekrasova, 2009; Sánchez Hernández, 2013; Simpson-Vlach and Ellis, 2010).

The Biber et al. (2004) model comprises three main categories: stance expressions, discourse organisers and referential expressions, defined as follows:

Stance bundles express attitudes or assessments of certainty that frame some other proposition. Discourse organisers reflect relationships between prior and coming discourse. Referential bundles make direct reference to physical or abstract entities, or to the textual context itself, either to identify the entity or to single out some particular attribute of the entity as especially important.

(Biber, et al., 2004:384)

These categories each contain a number of subcategories identified by means of an inductive approach which involves the generation of concordance listings. These listings enable the analysis of bundles in context, on which basis the lexical bundles that perform similar functions are grouped together. As with the structure of lexical bundles (§2.3.5.1), Biber et al. (2004:397) found a strong association between structural type and discourse function, with stance bundles generally being composed of dependent clause fragments (e.g. *are more likely to, it is important to*) and the majority of referential bundles composed of prepositional phrase fragments (e.g. *one of the most, in terms of the*), thus reinforcing arguments for the posited relationship between form and function. Biber and Barbieri (2007:265) argue that bundles are “consistently functional”, thereby supporting the notion that they have a formulaic status in that they become fixed with repeated use (§2.3.6.1). Patterns of lexical bundle use are then assessed in terms of different distributions of the functions.

Ädel and Erman (2012:89) express reservations about Biber et al.'s (2004) functional taxonomy on the grounds that, despite being presented as unproblematic by researchers such as Chen and Baker (2010), many of the subcategories are vague. They cite 'identification/focusing' and 'framing' as examples, presenting instances of inconsistencies in labelling in related studies as a result of a lack of clarity regarding the main categories into which these are incorporated:

For example, Focusing is labelled Discourse organising in Chen and Baker, but Referential in Biber et al. (2004) and Simpson-Vlach and Ellis (2010). Framing is labelled Referential in Chen and Baker and Biber et al. (2004), but Discourse organising in Cortes (2004).

Ädel and Erman (2012:89)

Ädel and Erman (2012) therefore argue for more qualitative analysis of how context affects the interpretation of corpora on the grounds that it is essential to consider the extended context when classifying lexical bundles according to their primary functions. They argue that, for cross-study comparisons to be feasible, the categories and subcategories of bundles should be clearly defined and should meet with general consensus. This argument may be regarded as somewhat idealistic, however, as it should be recognised that functional categories are difficult to define absolutely.

Byrd and Coxhead (2010) and Simpson-Vlach and Ellis (2010) based their analysis of functions on Biber et al. (2004), but with certain adaptations. Byrd and Coxhead (2010:43) created three broad categories on the basis of Hyland's principle that functions should be appropriate to the type of discourse being analysed. Their categories therefore focused on the essential purpose performed by bundles in presenting content, creating connections within texts and expressing the writer's attitudes. Simpson-Vlach and Ellis (2010), on the other hand, created a more extensive taxonomy than that developed by Biber et al. (2004) by creating additional categories such as 'contrast and comparison', 'hedges and boosters' and 'evaluation'. While they also collapsed two categories ('desire' and 'intention/prediction') into one ('volition/intention'), the overall effect was to increase the number of categories in Biber et al.'s classification system.

Although Hyland (2008b) retained the grammatical forms identified by Biber et al. (2004) for his own research, he developed an alternative set of functions on the grounds that the categories identified by Biber and associates were intended to distinguish between spoken and written modes of discourse, and so were not all directly applicable to research focused on written registers.

Biber's taxonomy emerged from a much broader corpus of spoken and written registers which included casual conversation, textbooks, course pack, service encounters, institutional tests, and so on, and this seems to have yielded far more personal, referential and directive bundles than my more research-focused genres.

(Hyland, 2008b:13.)

Hyland's classification is based on Halliday's linguistic macrofunctions – experiential (which Hyland refers to as 'ideational' (2008a:49)), interpersonal and textual (Thompson, 1996:28), and reflects the types of bundles characteristic of academic prose. For example, while stance is a superordinate category in terms of Biber's taxonomy, Hyland (2008b:13) includes it in a group of bundles used to refer to the reader or the writer. My own study adopts the functions used by Hyland (2008) as my focus is on academic prose and Hyland's classification is therefore more appropriate to the analysis of lexical features within the corpus. These functions are tabulated below, with definitions from Hyland (2008b:13-14):

No.	Type of function	Description
1	<i>Research-oriented</i>	Help writers structure their activities and real-world experiences
1a	➤ Location	Indicate time/place (<i>at the beginning of, at the same time</i>)
1b	➤ Procedure	Provide rationale or function (<i>the role of the, the purpose of the</i>)
1c	➤ Quantification	Related to measurement (<i>a wide range of, one of the most</i>)
1d	➤ Description	Related to depiction of features (<i>the size of the, the structure of the</i>)
1e	➤ Topic	Related to the field of research (<i>of lexical bundles in</i>)
2	<i>Text-oriented</i>	Concern the organisation and meaning of the text
2a	➤ Transition signals	Establish additive or contrastive links between elements (<i>in addition to the, in contrast to the, on the other hand</i>)
2b	➤ Resultative signals	Indicate inferential or causative relationships between elements (<i>as a result of, it was found that, these results suggest that</i>)
2c	➤ Structuring signals	Text-reflexive markers which organise stretches of discourse or direct the reader elsewhere in the text (<i>in the next section</i>)
2d	➤ Framing signals	Situate arguments by specifying limiting conditions (<i>in the case of, on the basis of, with respect to the</i>)
3	<i>Participant-oriented</i>	Focus on the writer or reader of the text
3a	➤ Stance features	Convey the writer's attitudes and evaluations (<i>it is possible that</i>)
3b	➤ Engagement features	Address readers directly (<i>it should be noted, as can be seen</i>)

Table 2.2: Types of discourse functions performed by lexical bundles

It should be noted that, whereas Hyland (2008b) includes topic-related bundles in his study, Chen and Baker (2010) specifically excluded all content-based bundles from their analysis. They then conjecture that this may be one of the variables that accounts for different findings with regard to the relationship between the use of lexical bundles and writing proficiency. While Chen and Baker (2010:43) found that more advanced writers used more formulaic expressions, and Cortes (2004) found that students seldom used bundles identified as frequently occurring in published writing, Hyland's (2008a and 2008b) research showed that Masters' students relied more on formulaic expressions than did PhD students or writers of published articles. In line with Hyland's (2008b) findings, however, Cortes (2004) also found a considerable amount of repetition of bundles present in student writing. This feature appears to be one of the ways in which novice writing is distinct from that of published writing. Chen and Baker (2010:44) conclude that the nature of the relationship between use of formulaic expressions and academic proficiency is still not clear.

Nekrasova (2009) investigates whether knowledge of lexical bundles is affected by discourse function and finds that students know more discourse-organising than referential bundles. (Nekrasova's classification of functions is based directly on Biber et al.'s (2004) functional taxonomy, with discourse organisers corresponding broadly to Hyland's text-oriented bundles, while the referential bundles relate to Hyland's research-oriented bundles.) On the basis of these findings she argues that discourse-organisers operate on a higher level within texts as they "indicate the connections between larger pieces of discourse" such as topic changes and the contrast between new information and old information (Nekrasova, 2009:673). Since discourse-organisers are key to general comprehension, Nekrasova proposes that they are more marked than referential functions, and so more easily recognised.

Although most bundles have a primary function, there are cases of multiple functions being performed by a single bundle, for example, *at the beginning of* can serve as a reference of time, place or text-deixis (Biber, et al., 2004:384). Byrd and Coxhead (2010:44) provide examples of lexical bundles with overlapping functions such as *at the same time* (addition + simultaneity) and *at the end of* (location – time/place + structuring within the text) to illustrate the difficulties of teaching bundles within the EAP classroom. Furthermore, levels of complexity are also illustrated by the bundle *as well as the*, which requires the interpretation that "the unit that comes after the bundle is the basic, standard one" (Byrd and Coxhead, 2010:45). As evidence of the confusion likely to be generated by the dual nature of certain functions, Cortes (2004:413) found that students use bundles to perform different functions from those typical of published writers, for example, the use by students of *at the same time* to convey the sense 'in addition to' rather than a co-occurrence of events. As is the case with the structural types,

one aim of my study is to determine the extent to which students' use of bundles to perform different discourse functions corresponds to that of published writers.

Lexical bundles are now generally regarded as chunks of language that aid cognitive processing. As such, they conform to a range of criteria used to classify lexical items or phrases as formulaic sequences. The theoretical background in terms of which formulaic sequences in general and lexical bundles in particular are identified and analysed is discussed in the next section.

2.3.6 Lexical bundles: Key aspects of the theoretical background

In the analysis of lexical bundles, the primary issues relate to the development and use of corpora for the analysis of bundles (§2.3.4), the grammatical and semantic features of bundles (§2.3.5), and the theoretical background in terms of which bundles are interpreted, as discussed in this section.

Lexical bundles are thought to enable the reader or listener to process chunks of language more quickly on the grounds that these are stored as formulaic sequences (Biber et al., 1999; Biber et al., 2004; Jiang and Nekrasova, 2007). Although Schmitt and Carter (2004) argue that formulaic sequences occur in such a multitude of forms it is difficult to define them comprehensively, the following definition by Wray is currently widely accepted:

a sequence, continuous or discontinuous, of words or other elements, which is, or appears to be, prefabricated: that is, stored and retrieved whole from memory at the time of use, rather than being subject to generation or analysis by the language grammar.

(Wray, 2002:9.)

This broad definition enabled Wray to use the term 'formulaic sequence' to encompass more than 50 terms that had been introduced into the literature to refer to the concept of a 'coherent lexical unit', including 'collocations', 'composites', 'idioms', 'multiword items/units', 'prefabricated routines', 'ready-made utterances' and 'unanalysed chunks'. Formulaic sequences range along a continuum from fixed phrases such as idioms and proverbs, to those which are more varied, such as collocations (for example, *glorious* and *weather* would remain collocates even when not directly adjoined, as in *glorious summer weather* and *the weather, although windy, remained glorious*). Schmitt, Grandage and Adolphs' (2004b) distinction between 'recurrent clusters' and 'formulaic sequences' is discussed briefly in the next section

(§2.3.6.1) with reference to Nekrasova's (2009) research on the perception of lexical bundles as holistic units.

The central idea that links all of these terms is that formulaic sequences are processed holistically in 'pre-packaged chunks' rather than word-by-word. This serves to facilitate both comprehension and production by reducing the cognitive load as there are fewer demands made in the course of processing language units. It has been proposed that as much as 80% of language is stored as formulaic sequences (Altenberg, 1998), although, in a more recent count, Erman and Warren (2000) calculated that formulaic sequences comprised 58.6% of spoken discourse and 52.3% of written discourse.

The following two sections consider aspects of lexical bundles as formulaic sequences. The first considers the degree to which lexical bundles may be regarded as having psychological validity, while the second explores facets of the acquisition of formulaic sequences by L2 speakers.

2.3.6.1 The psychological validity of lexical bundles

Following from the perspective that lexical bundles may be regarded as one type of formulaic sequence, it is proposed that these bundles provide a framework in terms of which to interpret new information.

These sequences of words can be regarded as structural 'frames', followed by a 'slot'. The frame functions as a kind of discourse anchor for the 'new' information in the slot, telling the listener/reader how to interpret that information with respect to stance, discourse organization, or referential status.

(Biber et al., 2004:399.)

The argument presented by Biber et al. (2004:400) is that "lexical bundles are stored as unanalysed multi-word chunks, rather than as productive grammatical constructions". Hyland (2008b:5) continues this argument by suggesting that bundles serve to "reduce processing time" as they are "stored and retrieved whole from memory". The claim that formulaic sequences are stored and retrieved in chunks from the mental lexicon is known as the holistic hypothesis, support for which is provided by Jiang and Nekrasova's (2007) study of the processing of multi-word sequences. On comparing formulaic with non-formulaic sequences, Jiang and Nekrasova (2007:442) found that formulaic expressions were represented and processed as holistic units:

In making grammaticality judgements, participants are supposed to analyse the syntactic well-formedness of the word sequences they read before deciding whether the phrase is grammatical or not. That is what happens when nonformulaic sequences, such as *on the chair*, are the stimuli. However, in the case of formulaic expressions, such as *on the contrary*, that are lexicalised and represented as single units in the mental lexicon, recognition of the component words [leads] to the localization or activation of the lexicalized formula. The localization of an entry in the lexicon tells the language processor that this is a grammatical phrase, which, in turn, leads to a positive response. No syntactic analysis occurs in the process. Thus, formulas can be responded to faster and with fewer errors than nonformulaic phrases.

(Jiang and Nekrasova, 2007:441.)

Their results showed that for both native and non-native speakers, reaction time was faster and error rate lower in responses to formulaic sequences such as *one of the most* and *as a result*, as opposed to non-formulaic sequences such as *one of the new* and *as a woman*. In other words, formulaic sequences seem to be recognised and processed as single units without the need to assess the grammaticality of the sequence. Schmitt and Carter (2004:5) claim that further confirmation of this is the phonological evidence that “formulaic sequences are typically spoken more fluently, with a coherent intonation contour”. In support of this Kuiper (1996, as cited in Schmitt and Carter, 2004:5) shows that the speech of auctioneers and horse-race commentators comprises a high proportion of formulaic sequences, enabling them to convey large amounts of information in a short period.

The holistic hypothesis has been extended by Hoey (2005:13), who argues that words are “primed” to occur in certain semantic sets, with particular pragmatic functions and in established grammatical patterns. Hoey’s hypothesis is therefore that frequent lexical associations determine grammatical structure to the extent that “grammar is an outcome of lexical structure” (Hoey, 2005:1). In terms of this paradigm, words do not have individual meanings, but gain meaning through a network of associations. Similarly, the concept of ‘lexical networks’ forms the basis of the argument for the Lexical Phrase Approach developed by DeCarrico and Nattinger (1992) as a means of addressing the difficulties experienced by L2 speakers in understanding academic lectures. This approach is based on the view that predictable or formulaic sequences enable speakers to focus on larger units of discourse, thereby facilitating the processing of language more quickly than they would do when processing unrelated items, and that frequency is key to the development of lexical competence (Ellis, 2002). DeCarrico and Nattinger therefore identified lexical ‘chunks’ that occur frequently in academic lectures, and categorised these according to discourse functions. They argued that

... teaching such lexical phrases and functional categories enhance[s] students' ability to comprehend academic lectures, principally by teaching them to *predict* what type of information is coming up next and to *organize* and *interpret* the flow of information more easily.

(DeCarrico and Nattinger, 1992:91.)

Hoey's argument regarding lexical priming is reinforced by Nekrasova's (2009) point that formulaic sequences occur in a specific order and yet are not governed by conventional grammar rules, as illustrated by Pawley and Syder's (1983:191) concept of a 'lexicalised sentence stem', that is "a unit of clause length or longer whose grammatical form and lexical content is wholly or largely fixed, [and which] forms a standard label for a culturally recognized concept". The principle of lexical priming is also evidenced in studies of phraseology, lexical bundles and collocations (Altenberg, 1998; Biber et al., 2004; Sinclair, 1991). Further support for Hoey's argument can be found in a case study by Schmidt (1983, as cited in Wray, 2000:483) of a Japanese immigrant to the USA. This study was concerned with the acquisition of communicative competence and the degree of acculturation. Of particular relevance to lexical priming is the finding that the adult immigrant had picked up a number of formulaic sequences and so was able to communicate with English speakers, but his grammar had remained fossilised as the grammatical features within the formulaic sequences did not transfer to non-formulaic sentences.

Although a number of studies have found formulaic sequences to have psycholinguistic validity (Conklin and Schmitt, 2008; Ellis and Simpson-Vlach, 2009; Jiang and Nekrasova, 2007), the first study conducted to test the psychological validity of lexical bundles (Schmitt et al., 2004b) proved inconclusive, while the results of the second study by Nekrasova (2009) suggest that not all lexical bundles have equal psycholinguistic status. Nekrasova (2009) investigated the question of whether lexical bundles are perceived as holistic units by L1 and L2 speakers, and whether the functions of the bundles had any impact on processing. Participants were required to complete a gap-fill activity as well as a dictation task designed to measure the degree of knowledge of both discourse-organising and referential bundles. Nekrasova's findings provide support for the concept of lexical bundles as holistic units as the participants' better recall of the bundles in contrast to non-formulaic sequences suggest that bundles are stored as unmodified chunks to assist with the retention of information. This improved recall applied only to more advanced L2 speakers as well as L1 speakers, suggesting that the less proficient L2 speakers had not yet developed the range of formulaic sequences in their mental lexicon to assist recall. An unexpected finding was that the more advanced L2 speakers were able to recall bundles with few modifications while the L1 speakers "showed more creativity within the reproduced bundles and created strings that were very different from the target bundles"

(Nekrasova, 2009:672). Nekrasova accounts for these findings by proposing that the L2 speakers are more easily able to retain stretches of words in short-term memory as a result of learning activities in the English classroom, while L1 speakers understood the overall meaning of the text and so reported the gist rather than repeating phrases verbatim. An additional finding by Nekrasova (2009:674) was that the participants tended to recall discourse-organising bundles such as *on the other hand* more easily than referential bundles such as *the rest of the*, *the beginning of the*, *the end of the* and *the top of the*. She suggests that discourse-organising bundles are easier to recall as they usually comprise fixed phrases (*on the other hand*, *as a result of*, *in addition to the*) whereas the open frames of the referential bundles (*the _____ of the*), mean that these are not retained as holistic units. One of the reasons for this poor retention may be that many of the open frame bundles are based on what Cortes (2013:40) refers to as “shell nouns, a type of abstract noun that has little or no meaning in itself, particularly when used in academic discourse”. Nekrasova (2009:675) therefore argues that “not all lexical bundles have the same psycholinguistic status” and so cannot all be regarded as formulaic sequences as they do not all share the feature of being stored and retrieved holistically.

It is of interest to note in this regard that Schmitt et al. (2004b:128), for the purposes of their investigation into the psychological validity of multi-word sequences, distinguished between “recurrent clusters”, that is, word strings derived from corpus linguistics but not necessarily stored holistically in the mind, and “formulaic sequences”, word strings that are stored in the mind as whole units but are not necessarily evident through corpus linguistic searches. On the basis of Nekrasova’s (2009) argument regarding fixed phrases versus open frame bundles, the former may be referred to as “formulaic sequences” while the latter would be termed “recurrent clusters”.

In their study of the processing advantages of lexical bundles, Tremblay, Derwing, Libben and Westbury (2011) found that sentences containing lexical bundles such as *in the middle of the* were read faster than control sentences in which the multi-word items used did not meet the frequency criteria of lexical bundles, such as *in the front of the*. The results of the study show that lexical bundles are processed more quickly than non-bundles, on the basis of which they argue that “LBs are stored while NLBs are computed” (Tremblay et al., 2011:573). However, while they acknowledge that the results suggest that lexical bundles may have some psychological validity as single lexical units, there is still the possibility that the results may be due to increased computation speed rather than providing evidence for holistic storage and retrieval. In other words, Tremblay et al. argue that their findings do not necessarily reflect the storage and retrieval of lexical bundles as holistic units. The faster processing time may instead

be a result of familiar patterns or sequences of words that enable the language user to access and construct the different syntactic structures more quickly. Another possibility is that the enhanced processing time is due to the mental lexicon's storage of 'frames' such as *in the _____ of* rather than whole chunks. The question that arises from the ambiguity of this finding is "what is stored and retrieved as wholes and what is put together from less complex parts" (Tremblay et al., 2011:596). This question ties in with Nekrasova's (2009) argument outlined above regarding the difference between those lexical bundles that have fixed frames and so are types of formulaic sequences (e.g. *as a result of*, *on the one hand* and *one of the most*), and those that have an open frame and so don't share the psycholinguistic status of formulaic sequences (e.g. *in the case of / in the context of / in the course of*). As this is clearly an area that requires further investigation, part of my study explores the use of the different discourse functions of lexical bundles by L1 and L2 speakers to assess whether there are significant differences in the mastery of bundles according to function and structural type.

Ellis and Simpson-Vlach (2009) and Ellis, Simpson-Vlach and Maynard (2008) report on a study conducted to assess different variables affecting the cognitive processing of formulaic sequences. Three-, four- and five-word bundles typical of academic discourse were identified from a number of corpora and served as formulaic sequences for the purpose of the research. The results showed that formulaic sequences are psycholinguistically valid, with recognition of these sequences affected by bundle length, frequency and mutual information (MI) score. While for non-native speakers, ease of cognitive processing of the lexical bundles correlated most closely with frequency of occurrence, the best determinant of processing speed for native speakers was MI score.

MI is a statistical measure commonly used in the field of information science designed to assess the degree to which the words in a phrase occur together more frequently than would be expected by chance; it is a measure of how much they cohere or are found in collocation.

(Ellis et al., 2008:380.)

While a formulaic sequence with high frequency may simply be the result of the frequency of the individual words, MI score reflects the degree of cohesion of items within a formulaic sequence as the higher the MI score, the stronger the association between the words within the sequence. Thus, for example, the formulaic sequence '*and at the*' occurred frequently as a result of the high frequency of each word in the string, but had a low MI score. In contrast, the formulaic sequences '*the first thing that*' and '*as opposed to*' both shared high MI scores, reflecting that the individual words in the string have "greater coherence than is expected by chance" (Ellis et al., 2008:391), corresponding with distinctive meaning and function as well as

clear grammatical form. The MI score can therefore be used as a measure of cohesiveness of the items within lexical bundles.

In line with the earlier arguments presented by Coxhead (2000) and Durrant (2009) (§2.2.2), but counter to the views expressed by Gardner (2007) and Hyland and Tse (2007), Simpson-Vlach and Ellis (2010) developed a list of formulaic sequences or ‘formulas’ intended to be generally applicable to academic discourse. These *n*-grams (that is, three-, four- and five-word bundles) were identified through frequency counts as well as the application of MI scores. The addition of MI scores as a statistical measure of cohesiveness was intended to bolster their argument that the identification of lexical bundles on frequency alone results in the “collapse of distinctions that intuition would deem relevant” (Simpson-Vlach and Ellis, 2010:490), thus creating bundles such as ‘*to do with the*’ which are not necessarily psychologically salient. In order to establish a reliable means of ordering the formulas derived from the corpora, these authors combined the measures of frequency and MI score as the basis for the ‘formula teaching worth’ (FTW) score. This score was designed to predict how instructors would judge the instructional value of each formula, enabling practitioners to rank the formulas in order of relevance within the academic context. The authors then grouped the formulas into primary discourse-pragmatic functions based on a concordance study in order to consider the most salient functions in academic discourse. In the process of allocating the formulas to appropriate functions, Simpson-Vlach and Ellis (2010:503) created functions not listed in the Biber et al. (2004) taxonomy (§2.3.5.2). These included ‘contrast and comparison’ (*as opposed to, to distinguish between, associated with the, the relationship between*) as a subcategory of the referential bundles, as well as two additional stance expressions: ‘hedges and boosters’ (*appears to be, as a whole, is likely that*) and ‘evaluation’ (*it is important to, it is clear that*) (Simpson-Vlach and Ellis, 2010:499-501).

Simpson-Vlach and Ellis (2010:508) argue that “formulaic sequences can be statistically defined and extracted from corpora of academic usage in order to identify those that have both high currency and functional utility”. They propose that the weighting of formulas on the basis of the FTW score serves to validate the words in the Academic Formulas List, ensuring that they are relevant across disciplinary boundaries. Their conclusion regarding the general applicability of formulaic sequences across disciplines contrasts with that of Hyland (2008b), who argues that both lexical bundles and academic vocabulary are discipline-specific. However, while Hyland’s argument is based only on frequency counts of these lexical items, Simpson-Vlach and Ellis (2010) base their viewpoint on a combination of both frequency and MI score, thereby including a measure of degree of cohesion of the items that make up the formulaic sequence. They propose that this inclusion of cohesiveness adds relevance to their

assessment of the worth of formulaic sequences on the grounds that “frequency alone generates too many items of undifferentiated value”, for example, *think about how, of the relevant and is obvious that* (Simpson-Vlach and Ellis, 2010:509; 494-495).

While the debate regarding the possible psychological validity of lexical bundles is still ongoing, the creation of a list of bundles along the lines of the Academic Formulas List (Simpson-Vlach and Ellis, 2010) could arguably be a valuable teaching tool provided that it takes into account frequency and distribution in academic texts from a range of disciplines, as well as MI and FTW scores. This value would depend to a considerable extent on evidence of a relationship between students’ use of lexical bundles and academic performance, as explored in Chapter 4 (§4.3.1.1).

2.3.6.2 The acquisition and use of lexical bundles by L2 speakers

As indicated in the earlier discussion on the psychological validity of lexical bundles, one premise underlying this study is that each formulaic sequence, in which the associations between the composite parts are permanently linked, is interpreted as a single unit rather than as a series of individual words, thereby reducing the time required to process the meaning of that sequence. Evidence seems to suggest that multi-word sequences are learnt as integral structures that are easily recognised and so serve to make language predictable, and in that way facilitate cognitive processing (DeCarrico and Nattinger, 1988; Nattinger and DeCarrico, 1992). In an extension of this reasoning, Biber et al. (2004:400) make the assumption that, since lexical bundles are stored and used as single units, they “do not present production or comprehension difficulties for speakers or listeners in classroom teaching”. However, this is a contentious point, as illustrated by Hyland’s (2008b) argument that inappropriate use of lexical bundles is one of the characteristics that marks the novice writer. Similarly, Pawley and Syder (1983) propose that it is the advanced L2 speaker’s failure to use formulaic sequences correctly that points to his or her status as a non-native speaker of the language. Given the difficulties with these forms reflected in the writing of L2 learners, it seems clear that the assumption made by Biber and associates should be tested in my study, particularly given the question of the degree to which lexical bundles are semantically transparent. The analysis of lexical bundles produced by students in the course of their undergraduate studies should provide some evidence of which lexical bundles students are able to use appropriately in context and therefore seem to have acquired.

Millar (2011) investigated the impact of failure by second-language speakers to use formulaic sequences correctly on L1 speakers’ mental processing. Given the premise that formulaic

sequences reduce the demands made on working memory, he hypothesised that “a close alignment of the formulaic sequences used by the speaker to those internalised in the mental lexicon of the hearer will result in lesser processing demands and lead to gains in communication” (Millar, 2011:130). The inverse of this assumption is that any deviations from standard formulaic sequences could lead to slower processing. Millar measured processing speed by means of a self-paced reading task in which the participant is able to control the rate at which text scrolls word-by-word across a computer screen. For the test items, Millar used two-word collocations or bigrams derived from a written corpus of Japanese university students for whom English was a foreign language. The aim of selecting bigrams produced by L2 speakers was to determine the effect of standard and non-standard or ‘deviant’ formulaic sequences on reading speed, for example, *ideal partner* vs *best partner*, *married life* vs **marriage life*. The findings of this study show that poorly formed collocations by L2 speakers result in slower comprehension by L1 speakers. Millar (2011:142) also found that errors in the construction of formulaic sequences by non-native speakers led to a “spillover effect”, that is, the delay in cognitive processing is not restricted to the formulaic sequence but continues to have an impact on the comprehension of words to the right of the poorly formed sequence. This suggests that learner deviations from the standard form present a ‘disruption’ in the reading process (Millar, 2011:145), and so have a delaying effect on the comprehension process as a result of the increased cognitive load. This finding has clear implications for L2 students as the non-standard use of collocations and other types of formulaic sequences in their writing is likely to have a negative impact on readers struggling to process the meaning of such idiosyncratic lexical items. This reduction in speed of comprehension, and related frustrations in decoding the meaning, may then negatively affect the assessment of that student’s written work. This seems to serve as further motivation for the introduction of lexical bundles into the language classroom. However, in order to test this assumption, the relationship between the use of idiosyncratic lexical bundles in student writing and academic performance is examined in the course of my study.

De Cock (2000 and 2004) examines the lexical preferences of native English speakers and advanced non-native speakers, focussing on formulaic sequences (referred to in De Cock’s study as “recurrent word combinations” or “recurrent sequences”) in spoken discourse. In this investigation of L1 and L2 speakers’ natural inclination to use certain lexical phrases over others, De Cock finds that much of the idiosyncratic use of these sequences can be accounted for in terms of the influence of the learner’s mother tongue, French. As a result of transfer from the L1, the language of advanced non-native speakers reflects patterns of overuse, underuse and misuse of target language sequences.

The findings of De Cock's study correspond to Granger's (1998:156) conclusion that L2 speakers overuse a limited number of formulaic or 'prefabricated' sequences as those they feel most confident using they tend to use to the exclusion of other, often far more appropriate, sequences. It appears that L2 speakers therefore learn to rely on a relatively small number of formulaic sequences as "lexical teddy bears", to use Hasselgren's (1994) expression. These findings are clearly valuable in drawing the attention of advanced learners to potential pitfalls in the use of formulaic sequences in the target language, thereby helping to reduce the gap between native and non-native speakers. In the case of my own study, one of the reasons for conducting a qualitative analysis of a sample of concordance listings is to establish whether similar types of usage errors occur in the student corpus, and thereby to highlight common problems that students have experienced with lexical bundles.

In line with Ellis's (2002) view that language acquisition and processing is primarily linked to frequency, one of the assumptions underlying the study by Tremblay and associates was that "the frequency effect is the most robust effect in psycholinguistic enquiry" (Tremblay et al., 2011:570). Biber et al. (2004:376) argue that the frequency-driven nature of lexical bundles has psychological validity on the grounds that "frequency data ... are one reflection of the extent to which a sequence of words is stored and used as a prefabricated chunk, with higher frequency sequences more likely to be stored as unanalysed chunks than lower frequency sequences". However, other corpus linguists in this field have argued that frequency is not the primary determinant of the psychological status of lexical bundles, and does not serve as sufficient evidence to support the premise that bundles operate as formulaic sequences. Wray (2000:467) argues that frequency is not necessarily a determining feature of formulaicity as frequency counts do not always reliably distinguish formulaic from non-formulaic sequences. This perspective then brings into question the need to focus on the acquisition and use of lexical bundles in the second language classroom on the grounds that their primary means of identification is through frequency of occurrence. However, Wray (2002:29-30) also presents the view that, the more frequently a word occurs, the less likely it is to have "independent meaning", that is, meaning unrelated to words in the context typically associated with it. The basis of this argument is that such words are commonly associated with other words from which their meaning is derived, for example, the use of 'take' in phrasal verbs such as *take in*, *take on*, *take over* and *take up*. This ties in with Sinclair's (2004:30) view that "words cannot remain perpetually independent in their patterning [and meanings] unless they are either very rare or specially protected". Nekrasova (2009:675) proposes that the saliency of bundles is determined by the interaction of three variables: frequency, distribution in a specific register and discourse function. Conklin and Schmitt (2008) identify frequency, familiarity, word length and priming (the speeding up of recognition of a particular word on the basis of a related word

which occurs prior to that item) as factors influencing the cognitive processing of lexical bundles, with familiarity in particular helping to speed up the recognition process, specifically in the case of low frequency words. These arguments by Wray (2002), Nekrasova (2009) and Conklin and Schmitt (2008) with regard to the validity of regarding frequency as a determining feature of formulaic sequences serve to reinforce the argument that lexical bundles, as one type of formulaic sequence, must be addressed as an area of concern for both first- and second-language speakers, in particular for those who are new to university studies and so not familiar with the lexical bundles typical of their subject areas (§2.3). In addition the question as to whether lexical bundles are acquired ‘naturally’ in the course of reading and classroom interaction or whether they require explicit teaching (see §2.3.2), is explored further in my study as a spin-off of the investigation into students’ production of lexical bundles in their written essays.

As discussed previously (§2.3.2), the study by Crossley and Salsbury (2011) into the development of two-word bundles by L2 learners over the period of one year was based on the assumption that language proficiency is linked to knowledge of multi-word forms. This supposition is based on the view that an understanding of “predictable sequences” enables speakers to process language more quickly (Crossley and Salsbury, 2011:5). In terms of the lexical network models, they propose that the establishment of connections between words is essential for language learning as this provides a framework in terms of which new words can be understood and assimilated. As a result it is possible to measure lexical proficiency by assessing a learner’s understanding of the relations between collocates. This premise could presumably be extended to other formulaic sequences in which there is a strong association between the words, for example, ‘*on the one hand*’ and ‘*on the other hand*’.

Crossley and Salsbury’s (2011) suggestion regarding the assessment of lexical proficiency through the measurement of lexical networks can be linked to Schmitt and Carter’s (2004:5) view that formulaic sequences are learnt over time by means of a process which enables learners to “fill in the gaps” left by the initial grasp of the sequence. This first encounter with the formulaic sequence often leaves only a partial impression of its form and meaning, requiring further encounters with the formulaic sequence in context to develop a better understanding of its lexical features. In the case of lexical bundles, one of these features would be the semantic constraints governing which words may be used to fill the slots. An additional feature that commonly distinguishes proficient native speakers from advanced non-native speakers is semantic prosody. The positive and negative connotations associated with formulaic sequences form a key component of the meaning of these sequences, and so are integral to a full understanding of the sequence. For example, while ‘*blonde*’ collocates with ‘*hair*’, it also

has a strongly pejorative meaning when collocated with ‘*dumb*’ that is understood to apply only to the semantic set [+female], although this need not be explicitly stated. Another example is the use of the lexical bundle ‘*it is possible that*’ as a hedge which literally reflects a degree of probability, with the underlying meaning that the speaker or writer is reluctant to commit to a proposition.

In accordance with Ellis and Simpson-Vlach (2009:73), who propose that formulaic sequences “have clear educational and psycholinguistic validity”, Biber and Barbieri (2007:284) argue that second-language students cannot succeed within the university context without an adequate command of lexical bundles. However, they propose that bundles present a particular challenge to L2 learners as they are “not perceptually salient, despite their high frequency” in that they were not apparent to linguists as lexical units until corpus linguistic processing brought to light the existence of these recurrent clusters of words (Nesi and Basturkmen, 2006). Given the clear need to create an awareness of lexical bundles, both Biber and Barbieri (2007) and Ellis et al. (2008) recommend that lexical bundles should be explicitly taught in the language classroom, and that further studies are required to investigate the acquisition of these features of the lexicon. The longitudinal study into the acquisition of formulaic sequences by Schmitt, Dörnyei, Adolphs and Durow (2004a), in which the participants were exposed to specific formulaic sequences as part of their EAP instruction, considered the effect of the following variables on the acquisition of formulaic sequences:

Attitudinal/motivational variable	Description
Attitudes toward L2 learning	Subjective appraisal of the enjoyment of learning L2s and English in particular
Integrativeness	A broad positive disposition towards the L2 speaker community, including an interest in their life and culture
Instrumentality	Perceived job- and career-related benefits of English proficiency
Language use anxiety	Anxiety experienced while using the L2
Commitment to learning English	The importance attached to mastering a high level of English
Intended effort	The amount of effort the student is willing to put into learning English

Schmitt, Dörnyei, Adolphs and Durow (2004a:60).

Table 2.3: Possible variables affecting acquisition of formulaic sequences

The results of Schmitt et al.'s study provide further incentive for investigation into the variables affecting acquisition of formulaic sequences as, although it was clear that development of formulaic language occurred in the course of the three-month research period, none of the variables identified as influencing language acquisition proved statistically significant, including the participant-related variables of aptitude and attitude/motivation. The conclusion drawn from this was that, as other factors appear to modify the learning of formulaic sequences, a longer study into individual differences and contextual variables is required.

I would suggest that a further aspect that requires investigation is whether there are particular forms and functions of lexical bundles that L2 speakers struggle with more than others. This question is investigated in my study, following a concordance-based assessment of idiosyncratic use of lexical bundles in student writing. Further motivation for my study is provided in responding to Wray's (2002:144) call for the development of data bases that would enable more detailed studies to be conducted on the use of formulaic sequences by individual learners.

2.3.7 Concluding remarks on lexical bundles

The review of lexical bundles is concluded here with an overview of what was covered, a discussion of those research findings from previous studies that are most relevant to my own research, and an assessment of the practical applications of those findings.

Following an introduction of the concept 'lexical bundles' as words that commonly co-occur across a range of texts, this section presented key distinguishing features of bundles, particularly with regard to the differences between lexical bundles and collocations. From this description of criteria in terms of which bundles are identified, I then presented a broad perspective on studies into bundles, from early investigations to the most recent research. This was followed by a discussion of key areas relating to my research, including the methodological approaches to the identification of lexical bundles, the development of corpora, the grammatical structures and discourse functions in terms of which bundles are categorised, and the arguments for regarding bundles as formulaic sequences. This exploration of the theoretical background incorporated a review of the psychological validity of lexical bundles as one type of formulaic sequence and the acquisition and use of bundles by L2 speakers.

The review of previous research on lexical bundles served to highlight those aspects of methodology, findings and applications that are of particular relevance to my own research method and objectives. These are outlined below, with reference to their impact on my study.

Biber and Barbieri's (2007) description of the methodology used in their study is extremely detailed, specifically with regard to the operational definitions, explanation of normalisation, and description of the concordance lists used to analyse bundles. Given that one of the primary focuses of this study is students' productive use of lexical bundles over the course of their undergraduate degree, concordance listings are employed in my study to examine the uses of bundles in depth. The aim of this qualitative analysis of concordance lines is to establish the grammatical features as well as the functions that the lexical bundles serve in context, both in the student corpus and in the published writing corpus. In addition, idiosyncratic uses by students of those lexical bundles typical to the writing of published authors are identified by means of keyword searches. This process is described in detail in Chapter 3 (§3.5.2.3).

As one of the few longitudinal studies conducted into the use of lexical bundles by students, Li and Schmitt's study (2009) also has particular relevance to my own in providing a framework in terms of which to assess idiosyncratic uses of bundles, and in exploring the idea that a student's use (or misuse) of lexical bundles has a direct effect on the assessment of their writing.

An additional discrepancy in previous findings relates to the question of whether there is a significant difference between L1 and L2 students' use of bundles. While Chen and Baker (2010), working with Chinese speaking students in the UK, found little difference between these L2 speakers and their native language peers, Ädel and Erman (2012), working with Swedish students in Sweden, found a considerable difference between the L2 students' use of lexical bundles and that of L1 students. It is hypothesised that this may be due to the difference between those for whom English is a second language and those for whom it is a foreign language. While there are insufficient EFL participants in this study to enable further investigation into the ESL/EFL distinction, the difference between first-language speakers and those who speak English as a second, third or fourth language (AL) are explored.

Another aspect of particular relevance to my own study is the issue of categorisation of bundle types in terms of structural and functional features. These categories are a key determinant in addressing the question of whether and to what degree L1 and AL students' use of bundles differ from each other based on native and non-native language proficiency, as well as differing from that of published writers based on degree of experience within the academic field.

Finally, another feature of my study is consideration of the practical applications of the findings for students. The primary aim of a considerable amount of research conducted within the field of applied linguistics is to find ways of addressing common problems experienced by students

in dealing with the reading and writing processes required within the university context. In this regard my own study aims to identify specific features of lexical bundles that present problems to both L1 and L2 students, and that distinguish their writing from that of published writers. Such practical applications are discussed in more detail in Chapter 5.

In conclusion, the primary motivation for my research into lexical bundles relates to their impact on success at university. It is argued that competent use of lexical bundles signals proficiency in a particular academic discipline, while repeated use of a limited set of bundles or idiosyncratic use reveals the writer to be a novice (Biber and Barbieri, 2007; Biber et al., 2004; Chen and Baker, 2010; Cortes, 2004; De Cock, 2000 and 2004; Hyland, 2008a and 2008b; Li and Schmitt, 2009). In order to establish the degree of validity of this assumption, a common theme in previous studies is the call for further research into lexical bundles – both to determine more clearly the differences between uses by students and by published writers, particularly given the discrepancies in findings in this regard (Chen and Baker, 2010; Cortes, 2004; Hyland, 2008a), and for longitudinal studies to determine more precisely the nature of the acquisition process of lexical bundles by L2 students. The focus of my research on lexical bundles within a corpus of psychology essays and journal articles should also provide further insight into the degree of variation of bundles within a single academic discipline.

2.4 IELTS as a predictor of academic performance

Although the IELTS test is currently used as a gate-keeping mechanism within many of the academic institutions around South Africa, it may be argued that variables other than the IELTS results (such as lexical bundle usage and academic vocabulary proficiency) could also be used to provide some indication of the likelihood of students' success within the university context. This section presents the background in terms of which such an argument may be posited.

In all the research conducted to establish the degree of correlation between IELTS results and academic performance, there has been very little general agreement on the value of the IELTS test as a predictor of academic performance (Dooey, 1999; Feast, 2002; Graham, 1987; and Woodrow, 2006). Kerstjens and Nery (2000), while acknowledging the difficulties in comparing studies of the predictive validity of the IELTS test, identify a number of common features that have emerged from a comparison of these studies:

Firstly, there seems to be growing evidence that the lower the English language proficiency, the greater an effect this has on academic outcomes. Secondly, there seems to be more likelihood of finding positive relationships between proficiency and academic performance when the variable

of area of study is controlled. Lastly, any positive relationships found between proficiency measures and academic achievement tend to be weak. This may be because academic performance is affected by many other factors aside from language. It may also result from the limited range of proficiency scores in these studies, as students with very low scores are generally not admitted into university.

(Kerstjens and Nery, 2000:87.)

The general viewpoint therefore seems to be that, while low IELTS scores can be used as an indicator of poor language proficiency, too many other variables impact on tertiary education for IELTS scores to be significant (Elder, 1993; Hirsh, 2007; Woodrow, 2006). It is important to emphasise in this context that, in spite of the number of studies designed to measure the IELTS test as an overall predictor of academic performance, it was in fact not developed for this purpose. "Although the score a student achieves in an IELTS test is meant to indicate whether he/she has a sufficient level of English proficiency to cope with the linguistic demands of tertiary studies, it does not imply that they will succeed academically or that they will not struggle linguistically." (Bayliss and Ingram, 2006:1.) The IELTS test was therefore intended simply as a measure of the English language skills required for tertiary education on the understanding that there are too many other variables influencing academic performance (see Appendix H). This study therefore looks both at the degree to which IELTS writing and reading test scores correlate with academic performance, and, more relevantly, at the degree to which the lexical features used in the IELTS Task 2 writing test overlap with those required in student academic writing.

The IELTS examination is an international language proficiency test that assesses English reading, writing, listening and speaking skills. It is managed by Cambridge English Language Assessment together with the British Council and IDP Education. The initial version of this test, the ELTS, was introduced by the British Council in 1980 to assess the English language proficiency of postgraduate students. Prior to 1995, the reading and writing skills tests were combined in a single module under one thematic link. Furthermore, different tests were designed for separate disciplines, that is, physical sciences and technology, life and medical sciences, and arts and social sciences. However, it was argued that the single thematic link confused the assessment of reading skills with the assessment of writing skills, and that one test for all disciplines would not discriminate for or against students from any particular discipline (Charge and Taylor, 1997:375).

The academic component of the test is used widely by English-medium universities as an entrance requirement for non-English speaking applicants, with scores ranging in Bands "from

zero (did not attempt the test) to nine (expert user)” (Feast, 2002:76). The IELTS guidelines recommend a score of Band 6.5 for linguistically less demanding courses such as mathematics, and a score of Band 7.0 or higher for linguistically demanding courses such as law (Hirsh, 2007:195), in conjunction with a requirement that none of the separate skills scores should be lower than Band 6.0. However, “[academic] institutions around the world accept an Overall Band Score of between 6.0 and 7.0 ... as evidence of English language proficiency” (Ciccarelli, 2001 in Feast, 2002:71). It is clear from this that a number of international students are accepted into universities and colleges on the basis of lower IELTS scores than is recommended. In her study of the relationship between IELTS test scores and academic proficiency as measured by Grade Point Average (GPA), Feast (2002) used multilevel regression analysis to compare a range of variables. In the discussion of her results, Feast (2002:82) explains that, given her findings, “raising the overall IELTS score from 6.0 to 7.0 results in a loss of 78 per cent of the international student population with a consequent increase of [only] 8.87 per cent in GPA”. She concludes by recommending instead that entry scores for international students are raised from 6.0 to 6.5, or, alternatively, “merely not allowing students entry with IELTS scores below 6.0 may be the solution” (Feast, 2002:84).

In acknowledging that international students are frequently granted access to universities on the basis of lower scores than are recommended, Murray (2013:305) argues that “the pressure on individual universities to obtain an ever-larger market share of the student population means that they are unlikely to unilaterally raise their English language requirements if this risks losing a competitive edge”. However, this raises the question of whether universities should knowingly admit students whose language proficiency does not meet academic requirements. Given the differences in the minimum scores required for admission and the ethical issues surrounding admission criteria, Dooley (1999), Graham (1987) and O’Loughlin (2011) suggest that educational institutions conduct independent studies to establish the link between language proficiency and academic success for their students, and so establish assessment thresholds relevant to their student body, institutional profile, and “the amount of English support available on campus” (Dooley, 1999:2). This call for independent research on English proficiency and academic performance serves as further motivation for my study, which aims to investigate scores on the reading and writing components of an IELTS test against both short-term and long-term academic results, that is, at the end of the students’ first year of study as well as at the end of their third year, when they complete their undergraduate degree. The focus on reading and writing skills is supported by Elder’s finding that these are “the most powerful short term indicators [of subsequent performance]” (Elder, 1993:81), while the focus on Task 2 of the IELTS writing test rather than Task 1 is based on the fact that Task 2 comprises a short essay on a particular topic whereas Task 1 involves the description of

graphically illustrated information such as a table, graph or map. Of the two tasks, Task 2 therefore more closely represents the academic essay typically required from undergraduates within the field of Humanities (§3.5.2.5).

Related to the issue of whether the IELTS test serves as a predictor of academic performance within the university context is the question of the degree to which the IELTS Task 2 writing rubric represents university writing, the predominant genre of which within the field of humanities is the essay. In their study comparing these two types of writing, Moore and Morton (2005) cite Horowitz's (1986) investigation of the tasks given to university students. Horowitz's main finding was that all the tasks required students to collect and reorganise source material as the basis for their essay. The nature of this task differs significantly from the requirements of Task 2 of the IELTS writing test in which students are required to express their opinion based on personal experience. Horowitz (1991, in Moore and Morton, 2005:45) refers to this as "context-free writing [in which] the crucial aspects of citation and text plurality are entirely absent". In a similar vein, Moore and Morton (2005:63) find that Task 2 requires writing that is spontaneous rather than researched and planned, based on anecdote and opinion rather than evidence, hortative rather than persuasive, based on 'real world' phenomena rather than the discussion and application of theory, and independent of any prior reading. On the grounds of these differences, Moore and Morton conclude that the current IELTS writing test does not serve as an appropriate model for the essays typically required by university students. This conclusion is supported by Mayor, Hewings, North, Swann and Coffin (2007). In their study of the writing of Chinese and Greek candidates for the IELTS test, Mayor et al. (2007:301) found that the writing produced by these learners did not meet the expectations of student academic writing, but "diverge[d] widely from the normal tenor of (professional) academic texts". In the case of these learners, the IELTS Task 2 rubric encouraged the use of a personal, involved style characterised, for example, by a predominance of personal pronouns such as 'we' and 'I'.

Following from the study conducted by Moore and Morton (2005), one of the aims of my research is to compare both frequently occurring academic vocabulary items and lexical bundles in Task 2 of the IELTS writing test with the academic vocabulary and bundles that commonly occur in student academic writing. The objective is to establish whether the types of lexical items in each writing task are sufficiently different to support Moore and Morton's conclusion. Looking at both single vocabulary items and lexical bundles as a type of formulaic sequence presents a broader perspective on the lexical features used in the different writing tasks and should therefore shed more light on this question than would only considering one type of vocabulary item.

Given that there is a lack of consensus on the IELTS test as a predictor of academic success, that some courses are more linguistically demanding than others, and that variables other than language proficiency (such as knowledge of subject area, maturity, motivation and social adjustment) determine academic success, an argument has developed for the introduction of alternative measures of assessment according to the requirements of the discipline (Graham, 1987; Hirsh, 2007). Science or engineering students, for example, could perform well in a technical area without necessarily displaying corresponding linguistic competence in a discursive or expository essay. Where IELTS is used, the requirements regarding listening, speaking, reading and writing band scores should have some flexibility and be negotiable in terms of factors such as discipline and previous academic record.

Issues such as the lack of a clear correlation between IELTS scores and academic performance as a result of the number of variables involved in success at university, the admission of students into universities despite IELTS scores below the recommended minimum, the question of the degree to which the IELTS Task 2 writing rubric represents the genre required by the university undergraduate essay, and the discrepancies in the nature of linguistic demands on students of different disciplines, have all led to the call for independent research into the validity of the IELTS test as a predictor of academic success with a view to creating alternative gate-keeping measures. Given the arguments presented above regarding the investigation of language proficiency and academic success within individual institutions, this study examines this relationship at Wits University by comparing the IELTS scores of a sample of students to their academic results. Since Wits University uses the IELTS test as a gate-keeping mechanism, "it is important to investigate the extent to which current IELTS levels are predictive of academic performance in specific academic settings" (Woodrow, 2006:52).

2.5 Conclusion

This chapter has presented an investigation into the theories and research that form the background to this study of academic vocabulary, lexical bundles and the IELTS test as a predictor of academic performance. The aim of this investigation has been to identify the main research questions explored to date, the theoretical background in terms of which these questions are posed, the methodology used to address these questions, and the empirical findings reported, particularly those that relate directly to my own study.

The first main theme explored in my study is that of academic vocabulary. One of the main areas of focus in the research conducted into academic vocabulary has been the relationship

between vocabulary proficiency and reading comprehension. Given the further argument that academic text comprises a substantial proportion of Graeco-Latin vocabulary (Coxhead, 2000; Nagy and Townsend, 2012) in conjunction with Corson's (1985) view that these items are particularly challenging for those students who do not come from an educationally advantaged background, it is anticipated that many additional language students in particular would struggle to interpret academic texts as a result of a poor grasp of academic vocabulary. To determine the validity of this assumption, the current study investigates the impact of academic vocabulary on the academic performance of both L1 and AL students.

Although it follows that, as vocabulary plays a role in reading comprehension, academic vocabulary is key to the interpretation of academic texts, and so must play a role in academic success within the academic context, it is not yet clear precisely what the degree of correlation between academic vocabulary and academic performance is, particularly given the number of other variables that influence success such as attitude towards learning, motivation and commitment (§2.3.6.2). One of the aims of my study is to contribute to the clarification of the role of academic vocabulary in particular, with a view to interrogating arguments surrounding the usefulness of the Academic Word List and its practical applications in the classroom. In addition, the ability of low frequency vocabulary (specifically, the 5000 and 10 000-word levels) to predict academic performance is examined in relation to that of academic vocabulary.

The issues explored within the second thematic area, that of lexical bundles, include a definition of the term, a review of the criteria in terms of which bundles are identified, and an explanation of how these differ from other multi-word combinations, particularly collocations. One of the key aspects of bundles to emerge from this discussion is that, within the academic community, competent use of lexical bundles distinguishes proficient writers from those who are not familiar with the discipline, in other words, newcomers to the field, such as first year university students. For this reason, one of the characteristic features of second language writing is the failure to use lexical bundles correctly. There is "a general consensus that [such phrases] are difficult for L2 learners to acquire" (Yorio, 1989, in Hyland, 2008b:7) as correct and appropriate usage requires a command of the associated register as well as lexicogrammatical structure. The analysis of lexical bundles within each discipline therefore helps the learner acquire the rhetorical tools expected (Hyland, 2008b:5). Hyland's conclusion regarding the need for the analysis of bundles within disciplines serves as motivation for my study.

One of the most relevant findings to emerge from these studies relates to the tendency of students to overuse a limited range of lexical bundles, while underusing others (De Cock,

2004), with the result that there is a marked difference between the bundles used by published writers and those used by students (Allen, 2009; Chen and Baker, 2010; Cortes, 2004 and Hyland, 2008a). Although there is general agreement that there are differences in the use of bundles by published writers and students, the exact nature of these differences is still in question. Hyland (2008a), for example, claims that students tend to use more formulaic sequences than published writers as they have a smaller selection of academic lexical items at their disposal, with the result that they tend to rely more on fixed expressions. Chen and Baker (2010), on the other hand, argue that their analysis of student corpora reflects the use of fewer lexical bundles than published writers. I would treat Hyland's finding with caution on the grounds that the students in his study were postgraduates at Master's and Doctoral level, and therefore not sufficiently distinct from published writers in writing style, in addition to which the student texts were likely to have been edited by a native speakers before submission for examination. As the participants in my study are undergraduate students they should be more representative of 'novice' status, and their writing should therefore more clearly illustrate the differences between those new to a discipline and writers with experience in the field, particularly given that the use of lexical bundles by first-year students are contrasted with that by students in their third and final year.

The contrast of published writing against that of student writing should help to establish more clearly which 'natural' patterns of lexical bundles comprise preferred and more proficient use. In line with Hyland's (2008a:44) premise that "control of a language involves a sensitivity to the preferences of expert users for certain sequences of words over others", this would provide material for the language classroom as students could be made aware of which bundles are most appropriate within the context of their studies. The argument for this practical application is based on Crossley and Salsbury's (2011) finding that knowledge of formulaic sequences is key to language learning, together with Byrd and Coxhead's (2010) view that students' attention should be specifically drawn to lexical bundles in order to create an awareness of how these vocabulary items are used in context – a viewpoint supported by a number of studies which advocate teaching lexical bundles (Jablonkai, 2009; Karabacak and Qin, 2013; Pang, 2010).

A second finding that relates directly to my study is that there is a difference in the use of lexical bundles by native and non-native speakers of English (Ädel and Erman, 2012; Chen and Baker, 2010; Crossley and Salsbury, 2011; Hernandez, 2013 and Nekrasova, 2009). Taking into account Hyland's (2008b) view regarding second language speakers' use of lexical bundles signalling a low level of academic competence, this finding is not unexpected. However, the specific nature of this difference is an issue that would benefit from further study.

For example, while Chen and Baker (2010) argue that L2 students tend to overgeneralise the use of bundles by relying too heavily on a few of these sequences, and suggest that the overuse of VP-based bundles in particular is a sign of immature writing, they found no clear correlation between proficiency and the number of bundles used. In contrast to this view, Crossley and Salsbury (2011:15) found that knowledge of multiword forms was predictive of language proficiency as the use and accuracy of these forms increased with proficiency level. Furthermore, while Chen and Baker (2010) found relatively little difference between the use of lexical bundles by L1 and L2 speakers, Ädel and Erman (2012) found considerable differences between the first- and second-language speakers in their study. Finally, while Ädel and Erman found that L1 students tend to produce a larger number of lexical bundles than L2 students, Hernandez (2013) found that the L2 students made use of a greater number of bundles in the context of spoken discourse. Clearly the differences in the use of bundles by native and non-native speakers of English require further investigation, and so is another area to which my study could contribute.

A notable investigation into lexical bundles conducted over an extended period is the longitudinal study by Li and Schmitt (2009), in which they examined the use of bundles by a Master's student over nine months. In contrast to this, the aim of my own research is to determine the development of students' competence in the use of bundles during the course of their three-year undergraduate degree, and thereby to corroborate or dispute Li and Schmitt's finding that formulaic language is learned incrementally.

Given that research into formulaic sequences is in its early stages, there are a number of unanswered questions surrounding this aspect of vocabulary acquisition. In recognition of the need for further research into formulaic sequences based on a range of independent corpora, Biber, Conrad and Cortes (2004:372) argue that the "overall importance of multi-word units in discourse can be fully understood only by undertaking empirical research studies from different perspectives". While a number of studies have examined how L1 and L2 speakers use lexical bundles, very few have considered the relationship between the use of lexical bundles and academic performance. Li and Schmitt (2009) found that, although there was no clear correlation, there was a suggestion that the marks allocated to essays were influenced by the degree of accuracy in the student's use of lexical bundles. As a longitudinal study based on both L1 and AL student writing in a university context, my study creates the platform to investigate the development in the students' use of bundles over the course of their undergraduate studies as well as to establish the degree of correlation between their use of bundles and their academic performance.

Finally, given the interest expressed in this study in the use of vocabulary as a possible predictor of academic performance, it is necessary to consider the relationship between the IELTS proficiency test and academic performance. The background to this interest in the IELTS test is the ongoing debate as to whether IELTS does serve as a predictor of academic performance. This debate has led to the call for institutions to provide evidence of entry levels appropriate for their student body in an attempt to resolve this issue. "Thus, context-specific studies are valued as they provide this evidence and contribute to an increasing literature on the relevance of IELTS in higher education settings." (Woodrow, 2006:56.) My own study does not explore the validity of IELTS as a predictor of academic performance to any considerable extent, but investigates one aspect of the IELTS Task 2 writing test as a measure of students' academic writing skills in relation to the requirements expected of undergraduates.

Chapter 3

Methodology

3.1 Introduction

This chapter presents a detailed explanation of the procedures followed in collecting and analysing the data required to investigate the validity of the hypotheses underlying this study. In addition to the discussion of the aims and research questions in terms of which each hypothesis was formulated, as well as the operationalisation of key terms, the research methods used are described in terms of the research design, participants, materials, procedures and analytical framework.

3.2 Research aims, questions and hypotheses

The broad aim of this study is to assess the degree to which the understanding and appropriate use of high-level (i.e. both academic and low-frequency) vocabulary and lexical bundles in student writing is linked to academic performance. While high-level vocabulary is measured by means of both receptive and productive vocabulary tests (Laufer and Nation, 1999; and Nation, 1990), as well as by an assessment of students' vocabulary profiles (Cobb, 2002), the students' use of lexical bundles is considered in terms of their density, range of types⁷ and appropriateness⁸ as compared to the use of lexical bundles by published writers in the same academic field. The density of a feature in this context refers to the proportion of one particular type of vocabulary item, either academic vocabulary or lexical bundles, to the overall number of words in the text. The density of academic vocabulary, high-level vocabulary test scores and the degree of appropriate use of lexical bundles is compared to students' performance on academic essays⁹ over a three-year period, while their scores on the reading and writing components of the IELTS test are also compared to academic performance. As this is a longitudinal study, the occurrence of both academic vocabulary and lexical bundles is examined in the writing of the same cohort of students from the first year, through the second year and into the third and final year of their undergraduate degree, with the additional variable of language background also being considered.

⁷ Measured in terms of the types of structures and functions used (§3.5.2.3b).

⁸ Assessed in terms of the standard as used by published writers (§3.7).

⁹ The term *essay* rather than *assignment* is used throughout this study on the grounds that, without exception, the student corpus comprises examples of sustained writing by students on a subject-relevant topic, using readings in the area under discussion. These academic essays therefore differ in style from other assignments such as short answers or English compositions.

In summary, the overall aims¹⁰ of this study are:

1. To examine the relationship between measures of students' high-level vocabulary and their academic performance.
2. To examine the relationship between students' use of the lexical bundles that are typical to published writing within a discipline and their academic performance.
3. To compare the use of academic vocabulary and lexical bundles in the writing of students who are first-language speakers of English (L1), with the writing of students for whom English is an additional language (AL), using published writing from the discipline as a benchmark.
4. To explore the extent to which there is development in students' use of academic vocabulary and lexical bundles over the course of a three-year undergraduate degree.
5. To compare the use of academic vocabulary and lexical bundles in student academic writing to their use in IELTS writing tests.

The aims regarding academic vocabulary are addressed in the course of investigating the following research questions:

- a. Is there a relationship between students' use of academic vocabulary in their essays and their academic performance, as measured by their essay results over the course of their undergraduate studies?
- b. Is there a relationship between students' results on the academic and low-frequency components of receptive and productive vocabulary tests and their academic performance, as measured by their essay results during the course of their undergraduate degree?
- c. Is there a difference in the density of academic vocabulary used by students who speak English as a first language (L1) and students who speak English as an additional language (AL), relative to the density of academic vocabulary used by published writers?
- d. Is there a difference in the density of academic vocabulary used by first-year and third-year students, relative to the density of academic vocabulary used by published writers?
- e. Is there a difference in the density of academic vocabulary used by students in their essays and that used in IELTS writing tests, taking into account the differences in length of texts?

¹⁰ For convenience and uniformity, the aims and research questions formulated in Chapter 1 are reproduced here.

- f. Is there a relationship between appropriateness of use of academic vocabulary by students relative to published writers, and their academic performance?

To address the aims regarding lexical bundles, the following questions are considered, again taking into account the differences in lengths of texts in each case:

- g. Is there a relationship between density of students' use of lexical bundles and their academic performance over the course of their undergraduate studies?
- h. Are there differences in the density, structures and functions of lexical bundles used by L1 and AL students, relative to the bundles used by published writers?
- i. Are there differences in the density, structures and functions of lexical bundles used by first-year as opposed to third-year students, relative to the bundles used by published writers?
- j. Are there differences in the density, structures and functions of lexical bundles used by students in their essay writing as opposed to in IELTS Task 2 writing tests?
- k. Is there a relationship between the appropriateness of use of lexical bundles by students relative to published writers, and their academic performance?

The extent to which the IELTS test serves as a reliable measure of academic performance is addressed in the following two questions:

- l. Is there a relationship between students' results on the IELTS writing test and their academic performance, as measured by their essay results?
- m. Is there a relationship between students' results on the IELTS reading test and their academic performance, as measured by their essay results?

It is hoped that a longitudinal investigation into these questions will add to our understanding of what constitutes appropriate use of academic vocabulary and lexical bundles within the field of psychology. Given the arguments regarding the importance for students of proficient use of academic vocabulary (Paquot, 2010; Scheepers, 2014) and lexical bundles (Biber and Barbieri, 2007; Cortes, 2004; Hyland, 2008a), the results of such a study should shed light on issues such as the extent to which high-level vocabulary and lexical bundles are acquired naturally through reading and classroom interaction, and the extent to which they need to be explicitly taught.

The broad research hypotheses formulated to address the questions posed in this section are outlined below. As it is not feasible to test such general hypotheses directly, these are

operationalised in terms of specific hypotheses, which, together with the means employed to investigate each operational hypothesis are explained in detail under 'Analytical and statistical procedures' (§3.6).

3.2.1 Overview of research hypotheses

The assumption underlying the broad research aim (§3.2) is that both vocabulary proficiency and the appropriate use of lexical bundles relate positively to overall academic performance. Various aspects of this assumption are addressed in the nine directional hypotheses underlying this study, the first of which relates to students' use of high-level vocabulary:

HV1 Students who perform well on measures of vocabulary proficiency are more likely to perform well academically.

The directional nature of HV1 is suggested, among others, by the results of Cooper's (1999) study, which found that a measure of the academic vocabulary of undergraduate students correlates more highly with academic performance than does a measure of basic, high frequency or more advanced, low frequency vocabulary. In this regard, the primary distinction between the earlier study and the current one is that, while Cooper's (1999) findings are based on a measure of receptive vocabulary in second-language speakers of English, this research takes into account the student's productive academic vocabulary based on a measure of the density of AWL items used by students in their essays, in addition to the results of both receptive and productive vocabulary tests of academic and low frequency vocabulary, and compares these figures with the students' essay results, considering first and additional language speakers as well as academic year as further variables.

Given these additional variables, two further hypotheses regarding the use of academic vocabulary can be derived from the research questions posed above. The first of these (HV2) assumes a difference between L1 as opposed to AL speakers, while the second (HV3) assumes a difference between the lexical competencies of third-year as opposed to first-year students:

HV2 First language students' use of academic vocabulary will approximate that of published writers more closely than will that of additional language students.

The assumption underlying HV2 is that students who are L1 speakers have an advantage over AL speakers on the grounds that they understand a wider range of the Graeco-Latin based

academic vocabulary (Corson, 1997). As a result L1 students are more likely to be able to emulate to some degree the style of writing typical of published articles in academic journals.

HV3 Third-year students' use of academic vocabulary will approximate that of published writers more closely than will that of first-year students.

The assumption underlying HV3 is that there is a gradual improvement in students' general vocabulary proficiency over the course of their undergraduate studies. The difference in proficiency would therefore be greatest between the third-year students and the first-year students, with students in second year having more proficiency than the first-year students, but less than the third-year students.

The final hypothesis relating to academic vocabulary is based on the assumption that one of the reasons the IELTS test may provide some indication of academic performance is that the written component of the IELTS test and academic writing share similar lexical features:

HV4 Students' use of academic vocabulary in their essays will approximate their use of academic vocabulary in the writing component of the IELTS test.

As indicated in Chapter 1 (§1.6), the focal areas of the study are academic vocabulary, lexical bundles and the IELTS test. The second set of hypotheses relates to lexical bundles, and the first of these concerns students' use of lexical bundles:

HLB1 Students whose use of lexical bundles approximates that of published writers more closely are more likely to perform well academically.

The presentation of HLB1 as a directional hypothesis is in line with Hyland's (2008b:5, 8) view that the expectations about learners within a particular discourse community include evidence of the ability to use the lexical bundles specific to that community appropriately. As discussed in Chapter 2 (§2.3), Cortes (2004) also argues that frequent use of lexical bundles suggests a degree of language proficiency within the academic community.

As the lexical bundle hypotheses were designed in parallel with those developed for academic vocabulary, two further hypotheses regarding the use of lexical bundles relate to differences in lexical competencies: firstly, between first and additional language speakers of English, and secondly, between third-year and first-year students:

HLB2 First language students' use of lexical bundles will approximate that of published writers more closely than will that of additional language students.

As in the case of HV2, the assumption underlying HLB2 is that first language speakers have an advantage over additional language speakers on the grounds that they have access to a wider range of multi-word sequences such as lexical bundles (Hyland, 2008a), and so are more likely to use bundles commonly found in published academic writing.

HLB3 Third-year students' use of lexical bundles will approximate that of published writers more closely than will that of first-year students.

As with HV3, the assumption underlying HLB3 is that students gradually become more proficient in their use of lexical bundles as they progress through their undergraduate degree.

The last of the lexical bundle hypotheses follows the same pattern as for academic vocabulary, and so is based on the assumption that the density and types of lexical bundles used in the written component of the IELTS test correspond closely to those used in student academic writing:

HLB4 Students' use of lexical bundles in their essays will approximate their use of lexical bundles in the writing component of the IELTS test.

The final hypothesis relates directly to the third focal area, and so explores the relationship between IELTS test scores and academic performance:

HIE1 Students who perform well in the IELTS test are more likely to perform well academically.

Each of the hypotheses presented above was formulated in line with the research questions posed in Section 3.2. As indicated previously, these main hypotheses are broken down into operational hypotheses which can be assessed (§3.6). This investigation of the latter incorporates both quantitative and qualitative measures as it was necessary to probe beyond frequency of occurrence, to explore idiosyncratic uses of lexical bundles, and the impact of these on academic performance, for example. These issues relating to the research design are discussed below.

3.3 Research design

This section presents an overview of the approach in terms of which the hypotheses presented above are investigated. This study exemplifies descriptive research (Seliger and Shohamy, 1989:124-125) in that it is non-experimental but involves quantitative data and analysis as well as qualitative data and interpretation.

Quantitative research is essentially based on the analysis of quantities, and so is defined by Dörnyei (2007:24) as that which “involves data procedures that result primarily in numerical data which is then analysed primarily by statistical methods”. Examples of quantitative data in this study are the vocabulary test results, the IELTS test results and the results of the vocabulary profile analysis, which are compared to the results of the students’ essays using SPSS, a statistical software program (IBM Corp, 2013). Current research into both high-level vocabulary and lexical bundles inherently demands a quantitative approach as both are derived from frequency counts (§2.2 and §2.3).

Although the primary approach in this study is that of quantitative research, the qualitative method is also employed. In contrast to the quantitative approach, qualitative research “involves data collection procedures that result primarily in open-ended, non-numerical data which is then analysed primarily by non-statistical methods” (Dörnyei, 2007:24). One instance of the qualitative data employed in this study derives from the investigation of lexical bundles in context by means of concordance lines (§3.5.2.3). The aim of this investigation was to identify the functions which the lexical bundles perform within different contexts, as well as any idiosyncratic uses. Thus, while the quantitative approach was used to identify the number of occurrences of a particular lexical bundle function (i.e. the number of tokens), the corresponding qualitative approach provided for a more detailed analysis of the context in which those lexical bundles occurred. In-depth investigations such as these created a platform for the identification of differences between the ways in which both lexical bundles and academic words were used by students as opposed to published writers. Given the differences between quantitative and qualitative approaches, then, it is important to note that *use* refers to ‘density’ in the context of the quantitative analysis, but to ‘appropriateness’ in the context of the qualitative investigation.

Another example of the implementation of the qualitative method in this study is the use of interviews. The aim of the interview questions was to gain further insight into the students’ understanding of the role of academic vocabulary and lexical bundles in their writing, to establish what particular difficulties they experienced with lexical items in general when reading

and writing, as well as to investigate broader issues such as what general aspects of university study they struggled with, and what support they would recommend be provided to first-year psychology students. The interviews therefore served to complement the quantitative approach, which may be considered somewhat “decontextualized [and] reductionist” (Dörnyei, 2007:35), by tapping directly into the participants’ views.

The combination of quantitative and qualitative approaches is referred to by Dörnyei (2007:20) as ‘mixed methods research’, and described as “a new and vigorously growing branch of research methodology ... [aimed at] offering the best of both worlds”. One of the main advantages to combining quantitative and qualitative approaches is that this enables the researcher to triangulate findings, thereby counteracting weaknesses in one particular method, and so “maximising both the internal and external validity” of the research (Dörnyei, 2007:43). This triangulation process therefore adds to the validity of findings by enabling the researcher to confirm various aspects of the statistical results, and is particularly applicable in the case of longitudinal studies such as this one.

Since one of the primary aims of the study is to explore the extent to which there is development in students’ understanding and use of high-level vocabulary and lexical bundles over the course of a three-year undergraduate degree (§3.2), it was necessary to follow the cohort of participants from their first year to their third year of university study. Dörnyei (2007:82) refers to this type of study, in which “successive measures are taken at different points in time from the same respondents” as a *prospective longitudinal study*. The main advantage of this type of longitudinal study is that it enables the researcher to measure linguistic changes as they occur, and thus monitor stages of development. In this sense the prospective longitudinal design differs significantly from what might be termed a longitudinal cross-sectional design, in which, for example, separate cohorts of first-, second- and third-year students would be examined within a single time frame, and performance differences across three years of study extrapolated from the findings. Dörnyei (2007:79) proposes that longitudinal research “serves two primary purposes: to *describe* patterns of change, and to *explain* causal relationships”. Both objectives are made possible through the combination of quantitative and qualitative approaches, with quantitative methods such as the vocabulary tests and frequency counts of academic vocabulary items in student essays used to measure change in students’ understanding and use of such items, while qualitative methods such as the interviews are used to probe the reasons for such change.

A key aspect of any research approach, however, is the question of whether it meets the requirements for reliability and validity. As the accuracy of the findings in any study hinges to

a considerable extent on the reliability and validity of the tests conducted as part of the study, these concepts are essential to the quality of the research. Essentially, while reliability is the degree to which the results are consistent and dependable, validity is the degree to which a test measures what it claims to be measuring. For the purposes of this study, validity is measured in terms of content and construct validity, as defined below:

Content validity refers to the representativeness of our measurement regarding the phenomena that we want information about. *Construct validity* refers to the extent to which the research adequately captures the concept in question.

(Paltridge and Phakiti, 2010:13)

Nunan (1992:15) argues that “it is extremely important for researchers to define the constructs they are investigating in a way which makes them accessible to the outside observer”. For the purposes of this study, the main constructs have been clearly defined in previous research: academic vocabulary by Coxhead (2000), low-frequency vocabulary by Nation (2001), and lexical bundles by Biber et al. (1999).

As Dörnyei (2007:50) explains, reliability is a measure of the expected consistency of a set of test results for a specific population in different circumstances, for example, as applied to a different set of test takers. A standard measure of reliability is the degree of correlation between two sets of test scores (Brown, 1988:99). In the case of this study, measures of reliability were based on the degree to which the vocabulary test results correlated with each other. The same reliability measure was applied to the essay results and overall year marks (§3.6.1).

While reliability focuses primarily on the consistency of test scores, validity is concerned with the measure used to obtain the scores. In the context of this research, support for content validity was based on the fact that the test formats used were well preceded (§3.5.2.3a). Similarly, the evidence for construct validity was the fact that the vocabulary tests were based on established research, while the test items designed to assess understanding of lexical bundles were drawn from the corpus of published writing, and met the frequency and range criteria stipulated for the identification of 4-word bundles.

In addition to considering the content and construct validity of the test itself, it is necessary to account for the broader concepts of internal and external validity, both of which are concerned with the overall quality of the research as a whole. Research therefore has *internal validity* if the results reflect only the variables measured in the study, while it has *external validity* if the findings can be generalised to other groups or contexts (Dörnyei, 2007:52). As with the

reliability of a particular set of test results, the findings of a study can clearly only be regarded as valid if they can be applied under different conditions, albeit within the same parameters for set variables such as population, and achieve the same outcomes as in the original study. As mentioned previously, the introduction of a qualitative approach in this study is expected to improve the validity of the findings following Dörnyei's (2007:45) argument that "mixed methods research has a unique potential to produce evidence for the validity of research outcomes through the convergence and corroboration of the findings".

Dörnyei (2007:75) argues that piloting is more important in quantitative than in qualitative studies as the psychometric properties of the research instruments are more critical to the research outcomes. In order to determine whether the design of the study had sufficient reliability and validity, a pilot study (cf. Cooper, 2013) was conducted with the aim of exploring students' use of both academic vocabulary and lexical bundles in contrast to their use by published writers within the same academic field. A broad overview of the pilot study is presented below, with a discussion of the implications of this study for the main study.

3.4 Pilot study

The pilot study set out to establish whether there is a relationship between students' use of high-level vocabulary, particular types of lexical bundles, and their academic performance. As an additional aspect to the study, students' writing in academic essays was assessed in terms of both academic vocabulary and lexical bundles, and compared to their writing in an IELTS test.

The collection of data for the pilot study was initiated at the start of 2011, with a request for volunteers from those undergraduate students who had enrolled for first-year psychology. As the pilot study was successful in that the data obtained supported the aims of the study and the statistical analyses did not reveal any unexplained anomalies, the data collected for the pilot study was incorporated into the main study, forming the first year of the three-year longitudinal study. The pilot study therefore served to test the methodology identified for the main study, while at the same time serving as the first step towards the collection of data for this longitudinal study, on the grounds that the data collection process used throughout 2011 had not proved to be flawed.

The review of the methodology used in the pilot study is divided into four sections: the development of the corpus, a profile of the participants, an overview of the vocabulary measurement techniques conducted and discussion of the results. In order to avoid repetition,

only a brief description of the methodology used in the pilot study is given in those cases where it is discussed in detail in the main study.

3.4.1 Development of the corpus

The corpus for this study was drawn from IELTS writing tests, student essays and published writing within the field of psychology. The IELTS tests were completed by Psychology I students in tutorials conducted at the start of the first semester. A sample of these was typed and saved in plain text format for assessment of the lexical features. Any errors made by the students were reproduced exactly in the process.

In order to build a corpus of student essays, three sets of psychology essays written by the students over the course of the year were collected. These essays were typed and printed by the students, and submitted as hard copies which were then scanned to pdf format, converted to rich-text format, 'cleaned' and converted to plain text for analysis. The 'cleaning' process involved the removal of headings and dates as well as references to sources that occurred in non-final positions in sentences. This was done to ensure that these did not interfere with the identification of strings of 4-word bundles.

The corpus of student writing was restricted to the essays of 87 students for the purposes of this pilot study. This number was based on a random sample of 100 Psychology I students who had completed both the IELTS reading and writing tests, the receptive vocabulary test and a demographic survey. The sample was then further reduced as only 87 participants from the initial sample submitted all three first-year essays. The corpus of published writing was drawn from a selection of the prescribed reading material for each essay, and included both journal articles and a selection from a psychology textbook¹¹. The number of texts and tokens comprising each section of the corpus is presented in Table 3.1 below.

Corpus	IELTS writing test	May essay	May readings	August essay	August readings	September essay	September readings
No. of texts	87	87	3	87	11	87	7
No. of tokens	25,230	152,538	47,750	125,407	67,733	110,437	35,282

Table 3.1: Number of texts and number of tokens (running words) in each corpus

¹¹ Details of the reading material prescribed for the May, August and September Psychology I essays are provided in the corpus references listed in Appendix A.

The method used to identify lexical bundles in the pilot study is applied in the main study, and so is discussed in detail in the description of the main study (§3.5.2.2).

3.4.2 Profile of the participants

As indicated previously (§1.2 and §3.4.1), the participants of this study were 87 first-year psychology students registered at the University of the Witwatersrand in Johannesburg. Their ages ranged from 17 to 30, although the majority (78%) were between 18 and 20 years old, with the next largest category (16%) between 21 and 22 years. Most of the students in the sample population were female (91%), with less than ten per cent being male. English was the mother tongue for a minority of the students (32%), while the remainder (68%) spoke English as an additional language.

3.4.3 Assessing vocabulary

A Vocabulary Levels Test was used to assess the students' grasp of different levels of vocabulary, rated according to frequency of occurrence. This test, originally designed by Nation in 1983 (Nation, 1990), is a measurement of vocabulary size that focuses on breadth rather than depth of word knowledge, and was revised and validated by Schmitt, Schmitt and Clapham (2001). This test has five sections, each corresponding to a different frequency level, including words from the AWL. In contrast to the measure of receptive or passive vocabulary done by means of the Vocabulary Levels Test, an assessment of students' productive use of academic vocabulary in their writing was conducted by means of Cobb's (2002) VocabProfile program. This program provides a breakdown of the percentage of words in each text according to frequency levels. For the purposes of this study, only the percentage of academic vocabulary was considered.

The discussion that follows presents a broad overview of the results from the pilot study that influenced the methodology applied in the main study¹².

3.4.4 Discussion of results

The first focus of this pilot study was the relationship between academic vocabulary and academic performance. As the relationship between the higher frequency levels and academic

¹² A detailed analysis of the results is presented in Cooper's (2013) article 'Can IELTS writing scores predict university performance? Comparing the use of lexical bundles in IELTS writing tests and first-year academic writing'.

performance was found not to be significant, the following table presents the positive correlations of the receptive vocabulary test results with the students' overall results for Semester 1, their essay averages and their year marks.

	Semester 1 result	Essay average	Year mark
Academic vocabulary	r = 0.432 R = 0.186 (18%)	r = 0.279 R = 0.078 (7%)	r = 0.132 R = 0.017 (1%)
10 000 frequency level	r = 0.539 R = 0.291 (29%)	r = 0.414 R = 0.172 (17%)	r = 0.239 R = 0.057 (5%)

Table 3.2: Comparison of vocabulary test results and academic results

While academic vocabulary accounted for 18% of the overall score in Semester 1, these results indicate that it generally has little impact on students' performance at the end of the academic year. The lower frequency vocabulary seems to have considerably more influence as 29% of the Semester 1 result can be accounted for by the students' degree of familiarity with this frequency level. However, as with academic vocabulary, indications of a relationship between vocabulary knowledge and academic performance become weaker over the course of the year as this vocabulary bears almost no relationship to the final year mark.

The results also reflected a weak relationship between the receptive vocabulary test scores and the productive use of this vocabulary in academic essays. This suggests that students have a relatively superficial knowledge of these vocabulary items, but do not have sufficient understanding of all the facets of these words (Nation, 2001:27) to be able to use them appropriately in context. Conducting a productive vocabulary test that examines depth of understanding may result in evidence of a stronger relationship between the test scores and the students' academic performance. This conjecture is supported by the far stronger relationship between students' grasp of words at the 10 000-word frequency level and their academic results, particularly in the case of the first semester. The main study therefore involves the implementation of a productive or active vocabulary test of academic vocabulary as well as words at the 5000 and 10 000 frequency levels.

Given that the corpus used in this pilot study comprised a small sample of academic essays, published writing and IELTS essays, the analysis was based on a limited number of lexical bundles, thereby restricting the scope of the study. Nevertheless, the comparison of types of bundles used by students as opposed to published writers showed that structurally more complex bundles such as the 'anticipatory *it* + verb / adjective' bundle, such as *it is important to* and *it is possible that*, occur less frequently in student writing, and so presumably are less

familiar to students. In addition, one of the more apparent differences in the functions used was that student essay writing tends to be considerably more topic-based, with more frequent use of bundles such as *this theory is that*, while published writers use more location bundles, giving specific references to time and place, and thereby providing the reader with more 'signposts' to assist the reading process, for example, *at the same time* and *in the context of*. Differences such as these suggested that an in-depth study based on a larger corpus was likely to reveal variations between student and published writing that have significant pedagogic implications, and may be used to guide students in developing writing skills that more closely meet the expectations of their discipline. For this reason the methodology used in the pilot study is applied in the main study in an attempt to confirm these findings on a broader scale and to determine whether students' use of lexical bundles develops from first year to third year.

One of the issues addressed in this study was whether there were differences in the types of lexical bundles used by students in academic writing as opposed to in IELTS writing tests. The analysis of lexical bundles revealed a clear distinction between the types used in each corpus. While the lexical bundles in the students' essays tended to contain more noun phrases and prepositional phrases such as *the way in which*, *as a result of*, *on the other hand* and *as well as the*, and were therefore characteristic of academic writing, the bundles in the IELTS test answers contained a greater number of verb phrase fragments more typically found in spoken discourse, such as *should be given the*, *has the right to* and *I agree with the*. The nature and significance of these differences are explored in more detail in the main study, as are the results of the IELTS reading and writing tests in relation to the students' academic performance, measured in terms of their essay results.

A considerable limitation to this study was the fact that distinctions between the lexical profiles of first and additional language speakers were not considered. This is an area that is addressed in the main study as an appreciation of the differences in the use of lexical bundles as well as in the command of academic and low-frequency vocabulary by L1 and AL speakers is critical to assisting additional language speakers in particular with academic writing.

3.4.5 Conclusion

Given that research into multi-word sequences, including lexical bundles, is in its infancy, there are a number of unanswered questions surrounding this aspect of vocabulary acquisition and use. "The overall importance of multi-word units in discourse can be fully understood only by

undertaking empirical research studies from different perspectives.” (Biber, Conrad and Cortes, 2004:372.)

This pilot study contributed to the research on lexical bundles, and added to the growing body of knowledge on how these multi-word sequences are used in different disciplines. However, it has also served to illustrate that further research is needed into the use of lexical bundles as well as the use of academic and low-frequency vocabulary by second-language (L2) speakers in particular. This follows from the finding that the 10 000-word level served as a better predictor of academic performance than academic vocabulary, and from Hyland’s (2008b:5) argument that, while L2 learners generally struggle with the acquisition of lexical phrases, learning to use the lexical phrases specific to a discipline contributes to a sense of communicative competence within that discipline.

Given that Wits University employs the IELTS test as a screening mechanism for non-native international students, another key research area is the question surrounding the extent to which IELTS serves as a predictor of academic performance. The results of this pilot study suggest that, while the IELTS reading test provides some indication of the likelihood of academic success in the first semester, neither the reading nor the writing components of this test appear sufficiently reliable to recommend a minimum score in this test as an entrance criterion. However, this initial investigation into the relationship between IELTS scores and academic results did not distinguish between the results of first and additional language speakers of English, and did not consider overall academic performance at the end of the third year of undergraduate study, with the result that these findings should be regarded as inconclusive. To determine whether the IELTS scores may be regarded as predictive for either first language or additional language students, a comparison between the IELTS scores and academic performance for these groups is conducted separately in the main study, taking into account both first year and final year academic results.

The gaps left by the pilot study clearly indicate the need for further research in these areas, thereby providing incentive for the continuation of the main study. As explained in the introduction to this section (§3.4), the main study is a continuation of the pilot study, and so incorporates aspects of the initial study, including the results of the receptive vocabulary test, the IELTS reading and writing tests, and the demographic survey conducted in 2011. Following from the pilot study, the methodology used in the design of additional material and in the analysis of data over the three years of the longitudinal study (from 2011 to 2013) are described in the next section.

3.5 Main study

The main study was based on a single cohort of undergraduate students who completed a series of tests as well as a demographic survey, and whose first-, second- and third-year psychology essays formed the student corpus. This section describes the method of participant selection, the materials used in the development of the vocabulary and IELTS tests, the design of these tests, the procedures followed in their administration, the development of the student and published corpora, and the instrumentation used in the analysis of the data generated in the main study.

3.5.1 Participants and setting

The participants in the main study comprise a proportion of the 782 psychology students who registered for their first year of study at the University of the Witwatersrand, Johannesburg, in 2011. While the pilot study was based on a random sample of these first years ($n = 87$), the subsequent second-year students were selected from those who were planning to continue with third-year psychology. This was established by means of a demographic survey conducted at the start of the first semester in 2012. Those students who had completed first year psychology in 2011, had indicated their intention to continue with third-year psychology, and had volunteered for the vocabulary test at the start of 2012 were included in the main study of 208 participants. On completion of the third year of study, only those students who had met the following criteria were included in the final analysis:

- a. Submitted two of the three first-year essays
- b. Submitted three of the four second-year essays
- c. Submitted three of the four third-year essays
- d. Provided demographic details.

Of the 208 students identified at the start of the second year, only 160 completed the minimum number of essays required from their first, second and third years of study, and so formed the cohort selected for longitudinal analysis. Table 3.3 below illustrates the numbers of students registered for first-year, second-year and third-year psychology between 2011 and 2013, with the number from each group selected as participants in the study:

	First year (2011)	Second year (2012)	Third year (2013)
Total no. of students	782	469	408
No. of students in study	87 (pilot study)	208	160

Table 3.3: Total number of psychology students and number selected for study

As a portion of these 160 students did not complete either one or both of the vocabulary tests and/or the IELTS tests, the number of cases included in the analysis conducted for each hypothesis varies according to the available data. These numbers are illustrated in Table 3.4 below:

Hypotheses	HV1a	HV1b	HV2a	HV3a	HV4a	HLB1a	HLB2a,b,c	HLB3a,b,c	HLB4a,b,c	HIE1a,b
No. of participants	160	98 / 120	160	160	148	160	160	160	148	151
Percentage of total	100%	61 / 75%	100%	100%	93%	100%	100%	100%	93%	94%

Table 3.4: Number of participants whose data was considered for each hypothesis

The primary justification for selecting participants from among the psychology students was the general popularity of psychology as a subject within the Faculty of Humanities. The large number of first-year registrations in conjunction with the number of students who aim to complete an honours degree in psychology supports the view that a considerable proportion of first-year students continue on to third year. (The psychology department at Wits University estimated in 2011 that approximately 530 of the 782 first-year students (68%) would continue with Psychology II, while about 300 of the estimated 530 second years (57%) could be expected to register for Psychology III.) Requesting volunteers for a longitudinal study from a course that is in high demand both as a major and as an honours programme, improves the likelihood of having a relatively substantial cohort of students continue through to the third year. In addition to this, the large numbers of psychology students are representative of a cross-section of the students registered for degrees within the Faculty of Humanities as a substantial proportion of humanities students register for psychology (an average of 54% between 2010 and 2014), with English literature and sociology as the subjects most commonly taken as majors in conjunction with psychology. An additional reason for selecting psychology students for this study was the number of written essays students are expected to submit over the course of each year. These represent a range of topics on personal and social conditions within

the field, and require various approaches, including discursive, expository, analytical and argumentative (see the corpus reference list in Appendix A for each essay topic). Lastly, lecturers within the department have been finding that many undergraduate students struggle to write academic essays. As a result, the Head of Department (HOD) was supportive of this research on the grounds that it may help to address some of the problem areas which students experience when trying to meet the demands of academic discourse. The HOD therefore gave his written consent to this project following approval from the Ethics Committee within the University of the Witwatersrand (Appendices B, C and D).

Based on the information gathered in a survey of the 160 participants, their ages ranged from 17 to 34, although the majority (85%) were between 18 and 20 years old, with the next largest group (11%) between 21 and 22 years. Most of the students in the sample population were female (88%), with only a small proportion of male students (12%). English was the mother tongue for a small majority of the students (60%), while the remainder (40%) spoke English as an additional language. Very few of this group spoke English as a foreign language (1.3%), a statistically negligible sample. For this reason, the study focused on the difference between L1 and AL speakers of English, with those who spoke English as a third or fourth language grouped with the second language speakers as 'additional language' users. It is important to note, as a limitation of this study, that the collection of demographics was dependent on students' self-reporting. It is possible that students who would, in sociolinguistic terms, be regarded as AL speakers, represented themselves as L1 speakers of English. One possible reason for this representation is that English is likely to be seen as a marker of prestige within the context of English-medium universities. Alternatively, students who grow up in a multilingual household but attend school in English, may regard themselves as primarily English speaking, and so see English as their first language.

A detailed profile of the first languages spoken by the participants is provided in Table 3.5 below. It should be noted, however, that this study does not take L1 influence into account as it is too wide-ranging to serve as a contribution to the role of mother tongue on vocabulary development.

First language	No. of speakers	Percentage of total
Afrikaans	3	1.87
English	57	35.62
Portuguese	2	1.25
Sepedi	7	4.38
Sesotho	5	3.12
Shona	1	0.63
Tsonga	4	2.5
Tswana	4	2.5
Xhosa	5	3.12
Zulu	9	5.63
Unknown ¹³	63	39.38
Total	160	100

Table 3.5: First languages spoken by participants

A survey of nationality showed that, of the 97 students who answered this question, the majority (96%) were South African, with only four students registered as citizens of other countries (China, India and Zimbabwe). A considerable proportion of the participants (39%) did not answer the question regarding nationality.

In order to address ethical considerations, the students were given a brief overview of the aims of the study, were informed that participation in the study was voluntary, and were asked to sign a consent form if they agreed to participate. The consent form contained written assurance that participation was voluntary, guaranteed anonymity and confidentiality, and included permission for their essays to be copied and incorporated into the student corpus (Appendices E and F). In return for their time and cooperation in answering the test questions and demographic surveys, the participants were given the opportunity to attend a lecture which provided guidelines on academic writing. This lecture was delivered during the lunch break every day over the course of a week in order to give the students every opportunity to attend.

It must be noted that the nature of the process used to select the participants in this study is likely to have skewed the results. The reason for this is the strong probability that mostly it was the more conscientious and responsible students who completed all the tests as well as the

¹³ While all the participants indicated by means of a tick whether English was their first, second, third or fourth language (Section B, Question 2 in the demographic survey – Appendix M), not all participants specified their first language (Section B, Question 1).

demographic survey. In accordance with the ethical clearance requirements for this study, students were advised that the tests were entirely voluntary. It may be conjectured that weaker students would be less inclined to participate as, for example, they may have believed that their time would be better spent studying or they may have felt threatened by testing conditions of any kind. These students are therefore likely to have a smaller representation in the sample. This limitation is discussed in more detail in Chapter 5.

This research was conducted at the University of the Witwatersrand, more commonly known as Wits University, situated in Johannesburg, South Africa. As Wits University is regarded as one of the more prestigious universities in South Africa, there is considerable competition amongst candidates to gain admission to the University. For example, of the 5629 applications made to the Faculty of Humanities for the B.A. degree in 2015, only 2118 (37.6%) were successful¹⁴. As a result the first-year students are generally those who have performed well above average in their matriculation results. Furthermore, one of the entrance requirements to the Psychology I course is a minimum of 60% for matric English. These fairly stringent admission requirements are reflected in the fact that the results of the weaker students enrolled for this course tend to fall in the 50 per cent range, rather than in the 40s or 30s. In accordance with this trend, the overall average year mark for the first-year psychology students in 2011 was 64%, with an overall average essay mark of 69%. (The calculation of the overall total mark for the course is based on a combination of essay, test and examination results, with essay marks contributing 40% towards the total, and test and examination marks contributing 60%.) In addition, a further requirement for admission to the University is a minimum score of Band 7 overall on the IELTS test for all international students for whom English is not a first language. As a result, the lower range of students for whom English is a foreign language rather than a first or second language, and who therefore would be more likely to struggle with the language demands made by university study, are excluded on the basis of their IELTS results.

As with the process used to select participants for the study, it must be recognised that research within the domain of a university such as Wits is automatically skewed as a result of the student profile. The stringent admission criteria that admit only the top range of matriculants do not create a platform for a typical bell curve distribution, but tend to skew results to the higher end of the curve. As a result of this skewed distribution, this study is not representative of those South African students who are typically at the lower end of the socioeconomic scale, but instead presents a profile of the more privileged and less disadvantaged students in South African society (Boughey, 2013; Jackson, Meyer and Parkinson, 2005; Stephan, Welman and

¹⁴ Professor H Jordaan, Assistant Dean, Faculty of Humanities, University of the Witwatersrand, personal correspondence: 14/01/2015.

Jordaan, 2004). It should be borne in mind, therefore, that the findings relate only to a fairly limited socioeconomic spectrum, typically students from urban areas, and typically those with a good level of conversational English, although this does not necessarily extend to proficiency in academic discourse (§1.2).

The next section of this methodology describes the data collection process, including the development of the student and published corpora, the analysis of these corpora, the development of vocabulary tests, the design of the questionnaires used in interviews, and the implementation of IELTS reading and writing tests.

3.5.2 Materials and data collection

The materials used as the basis for the collection of data include a demographic survey, a corpus of student writing, a corpus of published writing, receptive and productive tests of academic vocabulary, a test designed to measure understanding of appropriate lexical bundle usage, a number of interview questions, and IELTS reading and writing tests. The procedures used to develop and analyse these are outlined below.

3.5.2.1 Demographic surveys

Two demographic surveys were conducted to determine the gender, age, nationality, language background and educational background of each participant (Appendix M). The first of these two surveys was conducted at the start of 2011, and was handed out following the distribution of information on the background to the study, with a request that those students who were willing to participate sign a consent form (Appendices E and F). Those students who volunteered were then asked to complete the demographic survey before doing the IELTS reading and writing tests (§3.5.2.5). The second demographic survey was conducted at the start of 2012, and did not differ from the first, other than the addition of Question 6 in Section A. This question was added in order to identify those students planning to continue with third-year psychology, in other words, those who met the criteria for inclusion in the longitudinal study. The aim of the second survey was thus twofold: firstly, to obtain demographic information from any students who had not submitted this information in 2011 but had expressed an interest in participating in the study, and, secondly, to establish who, after the completion of the first-year psychology course, still intended to continue with the third year. Second-year students who volunteered to join the study at the start of 2012 were then included if they completed the demographic survey and the productive vocabulary test (§3.5.2.3a), and indicated their intention to continue with the third year. As the essays of all first-year students

had been collected in 2011, it was a simple matter to source the first-year essays of these second-year students for inclusion in the student corpus (§3.5.2.2).

As the participants who qualified for inclusion in the main study at the end of 2013 were determined primarily by the number of essays submitted over the course of their undergraduate studies (§3.5.1), the information obtained from the demographic survey was not used to exclude anyone from the study, but simply served to profile the students who contributed to this research project from the first year through to the third year of their undergraduate studies.

3.5.2.2 Corpus development

This section presents an account of the process used to build the corpus of texts that forms the basis of this study. This includes an explanation of the sources from which the texts were derived, a description of the cleaning process applied to each text before inclusion in the corpus, as well as the reasoning underlying decisions made with regard to features such as spelling and grammar errors in student texts, and the approach to overlapping bundles.

The corpus for this study was drawn from student essays and journal articles within the field of psychology as well as IELTS Task 2 writing test answers. The IELTS writing tests were conducted in tutorials with the first-year students, held at the start of the first semester in 2011. In order to obtain a sample of answers to a typical IELTS Task 2 writing test, the students were asked to discuss the following topic¹⁵:

Some people believe that a university education should be available to all students.

Others believe that higher education should be available only to good students.

Discuss these views. Which view do you agree with? Explain why.

As is standard for this section of the IELTS writing test, students were given 40 minutes for this task, and were asked to write a minimum of 250 words in response (see Appendix J for the test format and exact wording). All of the IELTS Task 2 writing tests collected from this group (n = 608) were typed from the original hand-written answers and saved in plain text format for inclusion into the overall student corpus as 'txt' files. Any errors made by the students were reproduced exactly in the process.

¹⁵ I requested permission from Cambridge ESOL to make use of IELTS practice tests (Appendix G) and received authorisation to continue my research using official practice materials (Appendix H).

While the IELTS writing tests formed one section of the student corpus, the majority of texts comprising the student corpus were the essays submitted by the psychology students during their undergraduate studies. The student corpus therefore comprises four sub-corpora: the IELTS texts, the first-year essays, the second-year essays, and the third-year essays submitted in compliance with requirements for the undergraduate degree in psychology (see Table 3.6).

The psychology students are required to submit two essays per semester – four per year, a total of 12 essays per student over the three years. Each of the psychology essays submitted by the final cohort of 160 students over the three years of their undergraduate course were captured in electronic format for inclusion in the student corpus. The Psychology Department requires that all essays be typed, and the majority of these were submitted as hard copies, with only two sets of essays submitted electronically via ‘Sakai’, the University’s online student management system. As the students are required to submit two copies of each printed essay, the Head of Department granted permission for the second copy to be released for use in this research project on the provision that these copies be kept for five years and be made available to the department should the original be lost.

The essays were collected from the department once the marking process had been completed, and were then scanned to ‘pdf’ format. In each case the cover page was scanned together with the essay for record-keeping purposes as the cover page included the student number, the course code and the date of submission of the essay. Each essay was then saved in ‘rich text format’ (rtf), with the file name allocated according to the student number, as well as the month and year on which the essay was due (e.g. PSY 123456 – 05 2011). Following Cortes’ (2004:403) description of the process of “cleaning” journal articles as the removal of titles, headers, footers, captions, scientific formulae and references, the ‘cleaning’ of student essays similarly involved removing titles and subtitles as well as all references – both within the essay and in the bibliography. The essays were also edited to ensure that any misrepresentations of the original text that had occurred in the process of scanning and converting from ‘pdf’ to ‘rtf’ formats were corrected. Typical examples of such ‘scanning errors’ are the conversion of an ‘i’ to either an ‘l’ or a ‘1’, an ‘e’ being changed to a ‘c’, a ‘c’ becoming an ‘o’ and the omission or alteration of punctuation marks. As all errors made by the students were left unchanged it was often necessary to check the ‘rtf’ document against the scanned ‘pdf’ version to establish whether an error was in the original essay or had occurred in the scanning process and so was only in the ‘rtf’ version. Those essays that were submitted in electronic version on ‘Sakai’ were simply downloaded and saved in electronic format. As a result these essays were less time-consuming to ‘clean’ than the typed transcripts as the

scanning process from printed to electronic text was not required. While it was still necessary to check the electronic-based essays for references, headings and subheadings which had to be removed, the editing process could be omitted.

As the students' writing was to be compared to a databank of published writing drawn from journal articles, it was necessary to develop a corresponding corpus of academic articles on the same topics as the psychology essays. The students' use of academic vocabulary and lexical bundles could then be compared with what is regarded as the norm in the various areas of study within psychology. The corpus of published writing was drawn from those journal articles prescribed for each essay as well as articles on related topics identified by means of keyword searches. The latter articles were selected from the top 50 psychology journals as ranked by the Journal Citation Reports (JCR), a measure of the impact of journals indexed in the Web of Science¹⁶, with keywords selected on the basis of the main theme and terms used in the essay topic. (Refer to Appendix A for the list of references in the published corpus.) The addition of journal articles other than those prescribed for each essay was required to supplement the published corpus, thereby increasing the number of words in relation to the student corpus. This increase served two purposes: the first was to achieve a reasonable ratio between the number of words in each student corpus and the corresponding published corpus, as illustrated in Table 3.6, while the second was to meet the minimum requirement for the normalisation process, as described below. As with the student corpus, each article to be included in the published corpus was 'cleaned' before its incorporation into the body of published text. Variations in both American and British spelling were retained as in the original articles, with the result that *behaviour* and *colour*, for example, both occur with and without the 'u' throughout the published corpus, according to the spelling rules in the country of publication. These articles were saved under an abbreviated form of the title of the article, and stored in files sorted according to the course code, with the month and year of submission of the essay for which they had been prescribed or to which they were related in topic.

The collection of first-year (PSY100), second-year (PSY200) and third-year (PSY300) psychology essays, together with corresponding articles and IELTS writing tests, resulted in the development of a corpus of approximately 5.6 million words. The exact figures for each essay and article are provided in the table below:

¹⁶ <http://guides.library.umass.edu/psychology>

Course	Essays /Articles	Course code	Year	Month	Number of files	Tokens	Ratio of essays to articles
IELTS	Writing tests	N/A	2011		608	169 283	
PSY100	Essays	PSYC1001	2011	May	200	230 189	1.62 : 1
	Articles	PSYC1001	2011		27	141 720	
PSY100	Essays	PSYC1002	2011	August	199	287 970	1.68 : 1
	Articles	PSYC1002	2011		26	170 540	
PSY100	Essays	PSYC1002	2011	September	201	251 587	1.50 : 1
	Articles	PSYC1002	2011		21	167 625	
PSY200	Essays	PSYC2004	2012	March	201	328 466	3.62 : 1
	Articles	PSYC2004	2012		09	90 666	
PSY200	Essays	PSYC2004	2012	May	202	406 877	2.37 : 1
	Articles	PSYC2004	2012		21	170 974	
PSY200	Essays	PSYC2020	2012	August	199	364 174	2.31 : 1
	Articles	PSYC2020	2012		17	157 499	
PSY200	Essays	PSYC2020	2012	October	182	335 956	3.48 : 1
	Articles	PSYC2020	2012		13	96 405	
PSY300	Essays	PSYC3001	2013	March	80	185 670	4.20 : 1
	Articles	PSYC3001	2013		13	44 170	
PSY300	Essays	PSYC3020	2013	March	38	73 411	1 : 1.2
	Articles	PSYC3020	2013		16	88 451	
PSY300	Essays	PSYC3017	2013	April	55	116 589	2.08 : 1
	Articles	PSYC3017	2013		11	55 852	
PSY300	Essays	PSYC3018	2013	April	43	109 293	1.22 : 1
	Articles	PSYC3018	2013		17	89 549	
PSY300	Essays	PSYC3015	2013	May	58	124 308	1 : 1.1
	Articles	PSYC3015	2013		24	137 497	
PSY300	Essays	PSYC3021	2013	May	53	139 183	1.93 : 1
	Articles	PSYC3021	2013		07	71 839	
PSY300	Essays	PSYC3019	2013	August	24	71 102	1.63 : 1
	Articles	PSYC3019	2013		09	43 361	
PSY300	Essays	PSYC3023	2013	August	51	126 691	2.79 : 1
	Articles	PSYC3023	2013		08	45 335	
PSY300	Essays	PSYC3034	2013	August	76	135 829	2.86 : 1
	Articles	PSYC3034	2013		06	47 448	
PSY300	Essays	PSYC3016	2013	September	44	97 206	1.64 : 1
	Articles	PSYC3016	2013		10	59 082	

Course	Essays /Articles	Course code	Year	Month	Number of files	Tokens	Ratio of essays to articles
PSY300	Essays	PSYC3013	2013	October	53	100 250	1.41 : 1
	Articles	PSYC3013	2013		14	70 880	
PSY300	Essays	PSYC3022	2013	October	48	139 504	2.28 : 1
	Articles	PSYC3022	2013		11	60 973	

Table 3.6: Number of tokens per essay within student and published corpora

It is clear from Table 3.6 that there is a considerable amount of variance among the number of texts, and hence among the number of tokens for each essay and corresponding set of articles. The problem of varying lengths of texts in the analysis was addressed by means of percentages in the case of the academic vocabulary, where the number of academic words is calculated per 100 tokens, and through normalisation in the case of the lexical bundles, as discussed in the next section (§3.5.2.3). However, with the exceptions of the third-year essays for PSYC3020 and PSYC3015, one of the trends is that the student corpus is on average twice the size of the published corpus. This is clearly evident in Table 3.7, as the average overall ratio for essays to articles is 2.04:1, and can therefore be rounded off to 2:1.

The total number of tokens in each of the corpora is provided in Table 3.7 below, together with the overall total of the student and published corpora:

Corpus	No. of tokens	Ratio of essays to articles
IELTS	169 283	
Sub-total (IELTS)	169 283	
PSY100 essays	769 746	1.60 : 1
PSY100 articles	479 885	
Sub-total (PSY 100)	1 249 631	
PSY200 essays	1 435 473	2.78 : 1
PSY200 articles	515 544	
Sub-total (PSY200)	1 951 017	
PSY300 essays	1 419 036	1.74 : 1
PSY300 articles	814 437	
Sub-total (PSY300)	2 233 473	
TOTAL WORD COUNT		
Psychology essays	3 624 255	2.00 : 1

Corpus	No. of tokens	Ratio of essays to articles
Psychology articles	1 809 866	
Sub-total (PSY corpora)	5 434 121	
IELTS	169 283	
Total no. of tokens	5 603 404	

Table 3.7: Number of tokens in student and published corpora per year and in total

The corpus described above formed the basis for the analysis of how academic vocabulary and lexical bundles are used by students and by published writers, with the aim of identifying similarities and differences in their use by the two groups. The computer programs and steps involved in the analysis process are described in detail in the next section.

3.5.2.3 Analysis of the corpus

The computer program used for identifying lexical bundles within the corpus was WordSmith Tools (WST), version 6.0 (Scott, 2012), a program able to analyse lexical bundles or word clusters, collocates, word frequencies and keywords. In order to identify appropriate bundles, WST was set to identify 4-word combinations of different frequencies, depending on the size of the corpus (ranging from an occurrence of at least twice in the smallest corpus to 16 times in the largest corpus, as explained below), and occurring in a minimum of five per cent of the texts in both smaller and larger corpora. This calculation of frequency and distribution thresholds was based on the principle of normalisation, as discussed in Chapter 2 (§2.3.3). Following Biber, Conrad and Cortes (2004:376), a conservative frequency cut-off ratio of 40 words per million served as the basis for the calculation of bundle frequency across all texts regardless of length. The cut-off of 40 per million words was normalised by calculating the ratio as a proportion of one million in smaller texts. Thus, in a text of 100,000 words, the minimum raw frequency would be 4 in order to establish the same ratio as for 40 words per one million. For this reason, when compiling the corpus, no collection of texts per essay topic, whether within the student corpus of essays or the published corpus of articles for that essay, was smaller than 40 000 tokens. This minimum of 40 000 served to set up a stable basis for normalisation by ensuring that the process would work on a ratio of 40 words per one million. As indicated in Table 3.6, the largest corpus in this study contained 406 877 tokens or running words, while the smallest corpus (that of the collection of journal articles for PSYC3019) contained 43 361 tokens. In terms of the normalisation ratio, the frequency threshold for the largest corpus was 16.27, rounded down to 16, while the smallest was 1.73, rounded up to 2.

As the identification of lexical bundles is determined by both frequency and distribution criteria (§2.3), range was taken into account in that the number of texts in which the lexical bundles occurred was as extensive as possible in relation to the total number of texts in each corpus. The low frequency threshold was therefore counterbalanced by requiring that the lexical bundles identified for analysis had as wide a distribution as possible, with an average range of 23% across the texts in the published corpus, and an average range of 15.8% in the student corpus. These range estimates are based on an average of the highest and lowest ranges in the most frequently occurring bundles from the published corpus (38.6% to 7.5%), and the highest and lowest ranges in the most frequent bundles from the student corpus (26.7% to 5.03%). The average distribution of the most frequent bundles identified for analysis in the IELTS corpus of 608 texts was fairly low, however, ranging from 9.05% to 5.6% (an average of 7.3%) as the majority of the lexical bundles used by students in this writing test contained keywords from the essay topic, and were therefore disregarded, following Chen and Baker's (2010) suggestion (§2.3.4).

In identifying four-word lexical bundles in both the student and the published corpora, the WST program was also set to ignore all numbers in the texts, to consider every possible sequence of 4-word combinations without disregarding high frequency lexical items such as *'the'*, and to take punctuation into account so that any word sequences spanning a punctuation boundary were not included in the count.

Each corpus was analysed separately to determine the most frequently occurring lexical bundles in the corpus. As in the pilot study, and in line with Chen and Baker's (2010) methodology, all content-based bundles were excluded on the grounds that subject-specific references, if incorporated, tend to dominate the lists of lexical bundles and do not accurately reflect use of general academic language. In other words, multi-word strings of terminology and context-embedded phrases do not reflect students' use of the more generally applicable bundles that occur across a wide range of subject areas within the discipline of psychology, and so impede the likelihood of reaching conclusions regarding the use of bundles outside one subject-specific area. This view is supported by the approach adopted in Biber's (2006:175) study as he excluded "local repetitions [that] reflect the immediate topical concerns of the discourse" and focused instead on "the more general lexical building blocks that are used frequently by many different speakers/writers within a register". Similarly, Ädel and Römer (2012:18) excluded "topic-related items" on the basis that these would not reflect diverse lexical preferences by students at different levels of study.

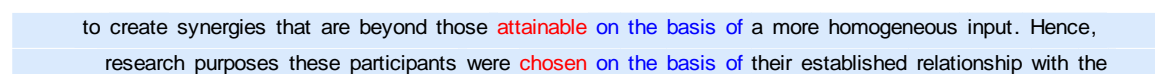
In keeping with this policy of discarding subject-specific lexical items, all lexical bundles containing words directly related to the topic of the essay were manually excluded from the count in order to avoid skewing the results in favour of context-specific terms. For example, the topic of the IELTS writing test was '*Some people believe that a university education should be available to all students. Others believe that higher education should be available only to good students.*' To eliminate content words, any lexical bundles that contained keywords from this topic, such as '*university*', '*education*' and '*students*' were not included in the count. Similarly, the topic of the 2011 May Psychology I essay was the structure and function of the brain. All lexical bundles containing terms relating to this topic, such as '*brain*', '*hemisphere*', '*lobes*' and '*frontal*', were disregarded in the count. This meant, for example, that the bundles '*in the left hemisphere*', '*lobes of the brain*' and '*the temporal lobe is*' were not included in the analysis of frequently used lexical bundles. An additional example, in this case taken from the 2011 August Psychology I essay, is the omission of the phrases '*youth-at-risk*', '*Erikson's theory*' and '*South African context*' from the selection of lexical bundles on the grounds that these are either technical terms or specific to the context of the essay topic. Similarly, those lexical bundles derived from the published corpus which included the phrases '*theory of planned behaviours*', '*the Big Five*' (with reference to personality traits) and '*the United States*' were discarded on the grounds that they were either technical terms or proper nouns. In addition, statistical terms and lexical items relating to the reporting of results specific to a particular study were excluded on the basis that such phrases are not likely to occur in the writing of undergraduate students. Examples of bundles that meet these exclusion criteria include '*means and standard deviations*', '*participants were asked to*', '*in the present study*' and '*our findings suggest that*'. The argument for discounting these bundles is based on the observation that statistical terms such as '*standard deviation*', items indicating currency such as '*present study*', and the use of personal pronouns such as '*our findings*' are used by writers to report on their own research, and so cannot be expected to occur in student writing as the essay genre is based on reports of studies conducted by researchers in the field, and not on independent research.

As argued above, the exclusion of certain bundles was done in order to identify the more generic lexical bundles that are typical of the broader discipline, but not necessarily specific to a particular subject, with a view to arriving at a more valid comparison of different texts. It must be recognised, however, that the exclusion of certain lexical items is a high-inference procedure and, as such, leads to relatively open-ended, subjective decision-making. As items are excluded on the basis of an approximate rule-of-thumb, this may result in the elimination of bundles that are not clear-cut cases, for example, '*and openness to experience*', '*of sense of community*', and '*of the life course*'. It is not always clear in cases such as these whether the

items are subject-specific or phrases that occur generally within all areas of psychology. However, the use of concordance lines to determine the context (§3.5.2.3b) and to examine other occurrences of these phrases assisted in the decision-making process. It should also be noted that the majority of problematic cases had a limited range which served to reinforce the deduction that they were particular to a specific area of psychology rather than more generic phrases.

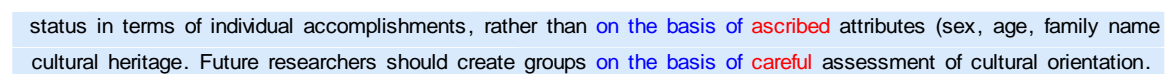
Also following Chen and Baker (2010:33), overlapping bundles were merged in order to include the most frequent in the count, with the additional words indicated in brackets. For example, the bundles *important to note that* and *is important to note* were merged to form a single multi-word sequence: *(is) important to note that*. In other words, to avoid duplicating the count, the most frequently occurring four-word string within the five-word bundle is only counted once in the form of the four-word bundle *important to note that*, with the fifth word indicated in brackets and with variations on this bundle excluded from the count. It should be noted that the identification of overlapping bundles had to be completed before the detailed analysis of lexical bundles could proceed, and that this process relied on concordance lines for confirmation that the two four-word bundles could be regarded as overlapping, as discussed below (§3.5.2.3b).

Part of the qualitative aspect of this study is thus the investigation of concordance lines. A concordance is “a list of all the occurrences of a particular search term in a corpus, presented within the context that they occur in; usually a few terms to the left and right of the search term” (Baker, 2006:71). The search term may be a lexical bundle, as demonstrated in the examples of concordance lines below:



to create synergies that are beyond those attainable on the basis of a more homogeneous input. Hence, research purposes these participants were chosen on the basis of their established relationship with the

Figure 3.1a: Concordance lines from the published corpus for *on the basis of* (L1)



status in terms of individual accomplishments, rather than on the basis of ascribed attributes (sex, age, family name cultural heritage. Future researchers should create groups on the basis of careful assessment of cultural orientation.

Figure 3.1b: Concordance lines from the published corpus for *on the basis of* (R1)

Figure 3.1: Concordance lines from the published corpus for *on the basis of*

These examples illustrate that, in the WST program, the search term is highlighted in blue and centred, while the words on either side of the search term can be sorted alphabetically – either immediately to the left of the search term (L1) or to the right (R1), as indicated by red highlighting. Concordances are an essential tool within corpus linguistics as they provide an effective means of analysing the context in which particular items occur. The WST program

presents two levels of concordance analysis: the first lists every occurrence of the search term within the context of the sentence in which it occurs, providing a segment of the sentence as well as of any adjacent sentence, with the number of words given depending on the number of characters specified for the concordance line. The second level of concordance analysis provides access to the text in which the search term occurs. This text is accessed by double clicking on the particular concordance line. The feasibility of in-depth analysis through the use of a concordance means that this tool is typically used for qualitative investigation following the quantitative assessment of frequency and distribution of words within a corpus (§3.3).

In line with Hyland (2008b), who investigated only the top 50 bundles in depth, the present study focuses on the top 150 lexical bundles in each of the three corpora (i.e. the published corpus, the student corpus and the IELTS corpus). The primary reason for focusing only on those lexical bundles with highest frequency and widest range is that these are inherently likely to be of most relevance to academic writing within the field of psychology. Of the top 150 in each corpus, 32 were discarded from the published corpus. As discussed earlier in this section, these bundles were excluded on the grounds that they were context-specific, technical or statistical terms, were overlapping or had a range of less than 5%, leaving 118 for analysis as 'target bundles' (Cortes, 2004), as discussed later (§3.5.2.3b). For the same reasons, 73 of the top 150 were discarded from the student corpus, leaving 77 to be analysed, while 133 were discarded from the IELTS corpus on the grounds that they contained words derived from the topic, were context-specific, or had a range of less than 5 per cent of the total number of texts. As a result only 17 of the 150 most frequently occurring lexical bundles in the IELTS texts qualified for analysis, the implications of which are discussed in Chapter 4 (§4.3.4.1). Once the most frequently-occurring 4-word lexical bundles had been identified, the grammatical structure and function of each bundle was classified on the basis of an adaptation of the categories established by Biber et al. (1999) and Hyland (2008b).

Prior to further discussion of the analysis of bundles, however, the methods used to analyse vocabulary at different frequency levels are described. These include receptive and productive vocabulary tests, the application of the VocabProfile program and lexical bundle tests.

3.5.2.3a Analysis of vocabulary

In order to assess the students' vocabulary, all participants were required to complete both receptive and productive vocabulary tests aimed primarily at measuring their knowledge of academic vocabulary items as well as items from the 5000-word and 10 000-word lists (§2.2.3). While the receptive vocabulary test was conducted with the first-year students at the start of

2011 and included vocabulary from the 2000, 3000, 5000, AWL and 10 000 frequency levels (Appendix K), the productive vocabulary test was conducted with the same students at the start of their second year in 2012, and included items only from the 5000, AWL and 10 000 frequency levels (Appendix L).

As discussed in the review of the pilot study (§3.4.4), the results of the receptive vocabulary test indicated that vocabulary scores at the different frequency levels generally did not relate to students' academic performance. This finding applied across all higher frequency levels as well as for the academic vocabulary. While the lower frequency vocabulary from the 10 000-word list seemed to have a considerably stronger relationship, with 29% of the Semester 1 result being accounted for by the students' degree of familiarity with this vocabulary, indications of a relationship between vocabulary knowledge and academic performance became weaker over the course of the year as this vocabulary had almost no relationship to the final year mark. The second vocabulary test was therefore introduced in an attempt to establish whether there is a stronger relationship between productive vocabulary and academic performance than is evident between receptive vocabulary and academic performance.

The receptive vocabulary test is a revised version of Nation's Vocabulary Levels Test (Beglar and Hunt, 1999), and was therefore applied as a measure of vocabulary breadth rather than depth in that it was used to assess receptive or recognition vocabulary at different frequency levels. Each frequency level within the receptive vocabulary test contained 30 test items, and took participants on average 20 minutes to complete, although the students were given 40 minutes for this test. Each test question required the participant to match three short definitions to their corresponding meanings, selecting three words from a possible six test items, all of which are taken from the same frequency level and have the same part of speech. For example:

The University Word List level

1. elementary
2. negative 1 of the beginning stage
3. static 3 not moving or changing
4. random 6 final, furthest
5. reluctant
6. ultimate

(Nation, 1990:270.)

As discussed in Chapter 2 (§2.2.3), the structure of the receptive test is based on an assumption of implicational scaling (Schmitt et al., 2001:56), that is, that knowledge of lower-frequency words can imply knowledge of higher-frequency items. Implicational scaling is based on the generally accepted notions that vocabulary learning is incremental (Schmitt, 2010), and that learners are more likely to be familiar with the meaning of words they have encountered several times, than with words they have encountered only once or twice (Nation, 2006). For this reason, high frequency words are intrinsically more likely to become familiar to learners before words that occur with less frequency. This applies to Nation's levels test in two ways: firstly, in that it was designed to provide a profile of learner's vocabulary at different frequency levels rather than simply an estimate of overall vocabulary size, and secondly, in that the words used to define the test items are always of a higher frequency than the test items themselves (Schmitt et al., 2001:58-59).

The relatively superficial nature of the receptive vocabulary test in only providing an estimate of the number of words recognised within each frequency level may account for the poor relationship found in the pilot study between the receptive vocabulary test scores and the students' academic performance (§3.4.4). In order to address this concern, the same cohort of students were asked to complete a productive vocabulary test, as discussed earlier.

As described in Chapter 2 (§2.2.3), the productive vocabulary test was adapted from Laufer and Nation's test of "controlled productive ability" (1999). This was a cloze test in which a sentence was provided for each test item that placed the relevant item in context, with the first few letters of the target word given in order to eliminate possible synonyms that may be suited to the context. For example:

It's impossible to eva_____ these results without knowing about the research methods that were used.

(Laufer and Nation, 1999:48.)

Laufer and Nation (1999) argue that this is a valid and reliable measure of learners' productive vocabulary as the test taker is required to produce the test item, albeit in a controlled environment, as opposed to simply matching a short definition to the appropriate word. In other words, while the receptive Vocabulary Levels Test is based on recognition of form, the productive version tests recall of form. However, Schmitt (2010:203) questions the impact of collocations between words in the context and test items, referring to examples such as:

- a. Every working person must pay income t_____.
- b. There are a doz_____ eggs in the basket.
- c. The pirates buried the trea_____ on a desert island.

Schmitt suggests that the strength of collocations such as *income + tax*, *dozen + eggs* and *pirates + treasure + island* makes the answer “rather obvious in this sentence context” (Schmitt, 2010:203), presumably because the collocational links would trigger the relevant target words in the mental lexicon. Furthermore, Schmitt proposes that the number of letters used to exclude other possible answers differ, as is also evident in the examples above, making some items easier to guess at than others. A third point raised by Schmitt is that there is no clear correlation between the results of this controlled productive test and other tests of productive vocabulary such as the Lexical Frequency Profile (Laufer and Nation, 1995), leading to some doubt as to whether this should be considered a test of productive vocabulary or whether it is an alternative measure of receptive vocabulary – “a form-recall test which assesses the form-meaning link” (Schmitt, 2010:204-205). Given Schmitt’s arguments, the possible shortcomings of the productive vocabulary test were compensated for in my study by the application of Cobb’s (2002) VocabProfile program. As with Laufer and Nation’s (1995) Lexical Frequency Profile, this program measures output of vocabulary in written texts according to frequency level, as outlined previously (§3.5.2.3) and explained in more detail below.

A third set of vocabulary tests was designed with the primary goal of assessing students’ understanding of a sample of lexical bundles. The 19 students who volunteered for the interview at the end of their undergraduate year (§3.3 and §3.5.2.4) were asked to complete a series of four short vocabulary tests before answering the interview questions (see Appendix O for the full set of tests and questions, as well as the model answers). The first of these four tests (Section B: Question A) was a repeat of the productive version of the AWL vocabulary test initially conducted with the second-year students at the start of 2012, and required the participants to provide the most appropriate word to suit the context, with the first two to five letters of the word provided as a means of delimiting the possible options. For example:

In a hom_____ class all students are of a similar proficiency.

(Laufer and Nation, 1999:48.)

The results of this retest of the academic vocabulary items were compared with the results obtained by the same sub-group of participants in 2012 in order to determine whether their grasp of this academic vocabulary had improved from the start of their second year of study to the end of their third year, and whether there was any difference in the degree of correlation

between the two academic vocabulary test scores and the students' averages per year for their second-year and third-year undergraduate essays.

In each of the second and third of the four vocabulary tests (Section B: Questions B and C), the students were given eight sentences together with 16 4-word bundles, and required to select the most appropriate lexical bundle from among the 16 in order to complete each sentence. These sentences were taken from the published corpus as a means of ensuring that the test questions had content validity, and were selected with the aim of eliciting some of the most frequently occurring lexical bundles in addition to a range of diverse functions. For example:

1. Human society does not function well _____ a sense of moral purpose and a cooperative stance toward others. [in the absence of] (framing)
2. For those young people who flee to new cultures and countries _____ conflict or disaster, acculturation and language skills have been linked to better adaptation over time. [as a result of] (resultative)
3. Cigarette smoking among adolescents remains _____ important public health challenges. [one of the most] (quantification)

The options given as possible answers for these gap-fills included *on the basis of*, *in the context of*, *in the case of* and *in the face of*. While it may be argued that bundles such as *in the context of* and *in the face of* could also be used to complete the second of the gap-fills given above, the six university lecturers who were asked to trial this test all selected *as a result of* as the most appropriate option given the context. This suggests that the use of any other bundle in this context may be regarded as marked.

For the last of these vocabulary tests (Section B: Question D), the participants were required to correct an underlined word or phrase in a sentence. In each case the sentence had been selected from the published corpus, and the incorrect form was based on a misrepresentation of an existing lexical bundle. Participants were not provided with the correct options in this question, but were expected to recognise the nature of the mistake without additional prompting. The aim of this question was therefore to elicit students' understanding of the correct form of bundles in context. For example:

1. The 72 hour period is the maximum that a person can be admitted on an involuntary basis for purposes of psychiatric examination. [*for the purpose of*]

2. Our findings are silent respecting to the question of whether gender differences in the variables we studied are caused primarily by biological factors or experience. [*with respect to the*]
3. Health locus of control is the measure to which people believe that they themselves, powerful others or chance influence their health and sickness. [*the degree to which*]

The results of the receptive and productive vocabulary tests were compared to the students' average results per year for their first-year, second-year and third-year undergraduate essays, while the results of the lexical bundle tests were correlated with the 2013 academic vocabulary results and the students' third-year average essay results. As those participants who had volunteered for the interview were the only ones to complete the lexical bundles test, the first-, second- and third-year essays of these participants in particular were selected for a more intensive, qualitative analysis of the way in which they used lexical bundles in their writing in the light of their test answers.

In addition to assessing students' vocabulary by means of receptive and productive vocabulary tests, this study examined the productive use of academic vocabulary within both student and published corpora by means of Cobb's (2002) VocabProfile program. This program is freely available on 'The Compleat Lexical Tutor' website and provides a breakdown of the percentage of words in each text according to three primary frequency levels. The results therefore indicate the percentage of words from the 1000 word list, the 2000 word list and the academic word list, as well as words that do not occur in any of these lists. For the purposes of this study, the percentage of academic vocabulary was considered in each of the essays and articles in terms of the number of tokens from the AWL list per total running words (AWL-tokens/total number of words). Considering the AWL tokens as percentages meant that the results for both measures could be compared across texts of different lengths.

Additional assessment of differences in the use of academic vocabulary by students and published writers, as well as by the various groups of students, was conducted through qualitative investigation (§4.2.5). A specific area of interest examined by means of keyness analysis, in which vocabulary items are compared on the basis of significantly different frequencies (§3.5.2.3b), is the question of the extent to which academic vocabulary items occur in isolation, their meaning independent of other words, or whether they are commonly linked either to function words or to nouns, verbs, adjectives or adverbs by means of a collocational relationship (§2.2.2). Evidence of academic collocations were sought for in the corpus of psychology journal articles, and the results compared with the occurrence of similar collocations in the corpus of student writing. The aim of this comparison was to determine the

degree to which students are able to emulate the use of collocations typical to published writing in the academic context, and so whether students require explicit guidance on common collocational relationships between academic vocabulary items and other words.

The strength of association between keyword and collocate was initially measured by means of both log-likelihood (LL) (§3.6.5) and Mutual Information (MI) scores (§2.3.6.1) to determine which was better suited to the aims of this study. Baker discusses the selection of appropriate statistical methods given that “different algorithms tend to favour different types of words” (2006:102). While log-likelihood takes into account both function words and content words, MI tends to favour low frequency items. An example of the difference in results based on log-likelihood as opposed to MI as a measure of strength of association for the key word *gender* is provided below in Table 3.8.

KEY WORD: GENDER

Published corpus		Student corpus	
MI value	LL value	MI value	LL value
male-advantaging 11.27	gender 24 345.86	work-family 15.57	gender 92 904.09
contentedness 10.85	and 2 136.64	spillover 15.40	and 19 296.28
typicality 10.45	of 1 787.46	labelling 14.43	the 15 273.83
timeline 10.27	differences 1 677.46	spill 13.27	differences 12 184.86
profited 10.27	in 1 305.51	imitating 13.08	of 11 948.16
atypicality 10.27	the 1 268.73	constancy 12.99	that 11 739.09
broadens 9.68	traditional 923.61	schemata 12.92	roles 11 474.52
incongruity 9.27	age 816.42	learnt 12.79	to 11 353.51
injunctive 9.27	to 813.45	essentialism 12.59	in 9 634.13
risk-adversity 9.27	ideology 728.92	stereo 12.59	is 8 740.38
undone 9.27	typing 605.41	gender-appropriate 12.6	identity 6 800.34
unreported 9.27	ethnic 590.13	categorise 12.6	stereotypes 6 574.58

Table 3.8: The top 12 collocates for the key word *gender* in the published and student corpora, listed in order of Mutual Information score and log-likelihood score

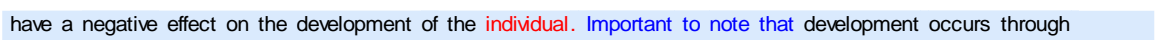
The different selection criteria on which the log-likelihood and MI algorithms are based is evident in the lists of collocates in Table 3.8 as the MI collocates are clearly low frequency items, with the result that a high proportion of the words are technical terms within the field of psychology (*male-advantaging*, *contentedness* and *risk-adversity* in the published corpus, and *constancy*, *schemata*, *essentialism* and *gender-appropriate* in the student corpus). Given that

the focus of this study is on academic vocabulary rather than on technical terms, and that there is little overlap between published and student corpora in the use of the low frequency items derived from the MI scores, the log-likelihood values were used as selectors of high frequency collocates, in terms of which the higher the value, the stronger the collocation (Baker, 2006:101). Following Baker (2006:54-55), the function or grammatical words generated in the analysis of collocates were disregarded in favour of the content or lexical words (nouns, verbs, adjectives and adverbs, with the exception of the copula verb *to be* which was also disregarded) as these provide a better idea of the semantic networks and lexical patterns within the text.

Following on from the overview of the approach to lexical bundles provided earlier (§3.5.2.3), the analysis of overlapping bundles is discussed in more detail in the next section, with further explanation of the role of ‘keyness’ in distinguishing student from published corpora for the purposes of the qualitative investigation, as well as elaboration on the classification of bundles.

3.5.2.3b Analysis of lexical bundles

As discussed earlier (§3.5.2.3), the analysis of lexical bundles involves the assessment of frequency and distribution, as well as factors such as the identification and omission of subject-specific and overlapping bundles. For the purposes of this study, overlapping bundles were merged in order to avoid overestimating the number of occurrences of these bundles. The analysis of concordance lines served to ensure that the two four-word bundles contained within a five-word sequence were both fairly equally represented in the corpus in which they occurred. To illustrate this point, the investigation of concordance lines for the five-word bundle discussed above, *(is) important to note that*, shows that the form *is + important to note that* occurs in 99.4% of the cases, with only one instance of *important to note that* not preceded by *is*:



have a negative effect on the development of the individual. Important to note that development occurs through

Figure 3.2: Concordance line from the student corpus for *important to note that* – not preceded by *is*

In the vast majority of cases, therefore, the four-word bundle *important to note that* is preceded by the verb *is*, although in 14.8% of the cases, an adjective (*also*), a conjunctive (*however*), or an adverb (*therefore*, *very*) is inserted into the five-word sequence between *is* and *important*, as illustrated in the concordance lines below:

women are expected to perform better than men. It is also important to note that managerial positions are associated change old behaviours or personality traits. It is, however, important to note that although personality is never the consequences of unethical matters. It is therefore important to note that empowerment may be achieved if people for example do not cook this. Also it is very important to note that all food for any prayer has to be

Figure 3.3: Concordance lines from the student corpus for *important to note that* – preceded by *is*

However, there are instances in which a five-word sequence does not contain equal representations of two four-word bundles. Within the student corpus, the bundles *the extent to which* and *extent to which the*, both of which occur within the five-word sequence *the extent to which the*, can, however, not be regarded as overlapping on the grounds that ‘*the*’ only forms 15.2% of the items which follow *the extent to which*. A random sample of concordance lines for the four-word bundle *the extent to which* serves to illustrate the range of items other than the definite article which follow this bundle:

an individual across time. Absolute continuity refers to the extent to which a particular attribute remains stable the lives of others then abnormality could be considered. The extent to which certain behaviours deviate from the between gender and crime. This essay will analyse the extent to which crime is universal, if at all, across had food more readily available and better healthcare, thus the extent to which eating disorders were present among studies would need to be carried out to determine the extent to which hypothesises raised in this paper may and present. Continuity in personality development refers to the extent to which individual characteristics remain . The third source of power is expert power which refers to the extent to which leaders are believed to have the skills is considered to be rich or poor does have an impact on the extent to which one is likely to be a victim a violent finds himself physically abused. Referent power refers to the extent to which people identify with the authority and convert them to become positive is through the extent to which social support is made available to

Figure 3.4: Concordance lines from the student corpus for *the extent to which*

In the published corpus, on the other hand, the lexical bundle *extent to which the* can be regarded as overlapping the bundle *the extent to which* as every instance of *extent to which the* is preceded by the definite article *the*, as is evident from the sample of concordance lines below:

of priming. Future research could profitably explore the extent to which the level and nature of provocation are summarized below: Skill variety. This refers to the extent to which the job requires the employee to draw 2, extremely high. A second analysis can be made of the extent to which the mean interresponse interval between by a negative mood induction procedure. Furthermore, the extent to which the mood induction activated the validity of the proposed theory. The construct validity, the extent to which the measured items actually reflect the supplemented with one item. Four items measured the extent to which the respondent was motivated to work

Figure 3.5: Concordance lines from the published corpus for (the) *extent to which the*

One of the results of restricting this study to an investigation of the top 150 bundles in each corpus (§3.5.2.3) was that *the extent to which* and *extent to which the* were regarded as overlapping in the published corpus but not in the student corpus. While *extent to which the*

does occur in the student corpus and, in the 21 instances in which it occurs, is always preceded by *the*, it does not occur within the top 150 bundles, and so was not regarded as overlapping *the extent to which* for the purposes of the analysis of the most frequently occurring bundles. In contrast to this, both lexical bundles occur within the top 150 most frequent lexical bundles in the published corpus, and so were regarded there as overlapping.

Following the initial identification of all lexical bundles in each corpus based on the criteria for frequency and distribution, and the exclusion of context-specific, technical and statistical terms from the most frequently occurring 150 bundles, as described above (§3.5.2.3), as well as the merging of overlapping bundles, the remaining 118 lexical bundles identified in the published corpus were regarded as ‘target bundles’ (Cortes, 2004) (Appendix S). As discussed in Chapter 2 (§2.3.2), Cortes (2004) identified the most frequently occurring bundles in a corpus of published writing, marked these as ‘target bundles’ and then investigated the use of these specific bundles in student writing. Similarly, in this study, the lexical bundles used most commonly in the published corpus were earmarked as those which students should presumably emulate in order to attain a writing style less typical of an academic novice. The student and published corpora were then examined for differences in the use of these target bundles in terms of density, range of structural types and range of functional types. Following the identification of the lexical bundles within the corpora according to frequency and distribution, they were classified in terms of the grammatical structures and textual functions described below.

Biber et al.’s (1999) classification system for the structure of lexical bundles, based on the identification of the primary grammatical element within each bundle, has been used in a number of research studies in this area (e.g. Cortes, 2004; Hyland, 2008). An adapted version of this framework was developed for this study in order to account for lexical bundles in the student corpora that did not fall into Biber’s classification system. These adaptations involved the addition of seven categories, as presented below:

Grammatical category	Types of bundle structure
<i>Verb-based</i>	(passive) VP + noun phrase
	modal + (passive) VP
<i>Preposition-based</i>	prepositional phrase + complementizer
<i>Noun-based</i>	noun phrase + verb phrase fragment
	noun phrase + <i>to</i> -clause fragment
<i>Other</i>	adjectival phrase
	conjunction + NP/PP

Table 3.9: Grammatical structures added to Biber's (1999) classification system

The complete adapted taxonomy used in this study is presented below. It includes some of the categories identified by Biber et al. (1999), together with the additional categories listed above, both of which are illustrated by means of appropriate examples of 4-word bundles.

Verb-based

- Verb phrase + *to*-clause fragment *(are more likely to, have been shown to)*
- (Passive) VP + prepositional phrase (fragment) *(can be defined as, were included in the)*
- Anticipatory *it* + VP(adj.) + *to*-clause fragment *(it is important to, it is necessary to)*
- Anticipatory *it* + VP(adj.) + complementizer *(it is possible that, it was found that)*
- Anticipatory *it* + VP *(it should be noted)*
- (Passive) VP + noun phrase *(is one of the, be given a chance)*
- Modal + (passive) VP* *(should be entitled to, should have access to)*
- First person pronoun + dependent clause fragment* *(I agree with the, I believe that every)*

Preposition-based

- Prepositional phrase *(on the one hand, at the same time)*
- Prepositional phrase + *of* *(on the basis of, at the end of)*
- Prepositional phrase + complementizer *(in a way that, to the fact that)*

Noun-based

- Noun phrase + *of* *(the end of the, a wide variety of)*
- Noun phrase + prepositional phrase (fragment) *(an important role in, the relationship between the)*
- Noun (phrase) + verb phrase fragment *(research has shown that, this is due to)*

*Specific to the IELTS texts

- Noun phrase + *to*-clause fragment* (*the opportunity to study, the key to success*)
- Noun phrase with other post-modification (*one of the most, the fact that the, the extent to which*)

Lexical bundles with dependent clause fragments:

- *That*-clause fragment (*that there is a*)
- *WH*-clause fragment (*when it comes to*)

Other

- Adverbial phrase: (*as well as the, as well as in*)
- Adjectival phrase: (*more likely to be, due to the fact*)
- Conjunction + PP/NP: (*and as a result, and the number of*)
- Others: (*there is evidence that* - dummy subj. + VP)

While Biber et al. (1999:1021) include bundles such as *is part of the, be the result of, is due to the* and *may be due to* under the general category ‘copula *be* + noun phrase/adjective phrase’, a distinction is drawn in the current study between the categories ‘verb (phrase) + *to*-clause fragment’, ‘(passive) VP + noun phrase’ and ‘modal + (passive) VP’. Similarly, while Biber et al. (1999:1015-1016) distinguish between ‘noun phrase + *of*-fragment’, ‘noun phrase + prepositional phrase fragment’ and ‘noun phrase + post-nominal clause fragment’, which includes the bundles *the way in which, the extent to which* and *the fact that the*, in this study two further categories were added under ‘noun-based bundles’: ‘noun phrase + verb phrase fragment’ and ‘noun phrase + *to*-clause fragment’, to account for bundles such as *research has shown that* and *the opportunity to study*.

Finally, the addition of categories such as ‘prepositional phrase + complementizer’, ‘adjectival phrase’ and ‘conjunction + NP/PP’ allowed for finer distinctions to be drawn from the more general categories of “other prepositional phrase (fragment)” and “other expressions” (Biber et al., 1999:1018 and 997). At the same time, many of the categories assigned by Biber et al. (1999:996) to lexical bundles typically associated with spoken discourse, such as ‘pronoun/NP (+auxiliary) + copula *be*’ (*it was in the*), ‘(auxiliary +) active verb’ (*have a look at*), and ‘yes/no and *wh*-question fragments’ (*can I have a*), were excluded from the analysis conducted in this study as they did not occur either within the two primary written corpora (i.e. the student corpus and published corpus), or in the smaller IELTS corpus.

Hyland (2008a:44) supports the argument that types of bundles are clearly linked to register by providing examples of bundles characteristic of academic writing as opposed to

conversation. He identifies the grammatical features of 70% of bundles found in written academic discourse as:

preposition + noun phrase fragments (*on the basis of, in the case of*), noun phrase + *of*-phrase fragments (*a wide range of, one of the most*) as well as anticipatory *it* fragments (*it is possible to, it is clear that*) ... [while] 60% of patterns [in conversation] are personal pronoun + lexical verb phrases (*I don't know what, I thought it was*) and auxiliary + active verb (*have a look at, do you want a*)

(Hyland, 2008a:44.)

The lexical bundles in each corpus were analysed in terms of the grammatical structures outlined in this section in order to assess to what degree the types of bundles that occur in essays written for the IELTS Task 2 test, for the undergraduate psychology essays and for the journal articles can be compared. A similar analysis was conducted in terms of the functions performed by the bundles in each corpus, as discussed below.

Hyland (2008b) retained the grammatical forms identified by Biber et al. (2004) for his own research. However, he developed an alternative set of functions on the grounds that the categories identified by Biber and associates were intended to distinguish between spoken and written modes of discourse, and were therefore not all directly applicable to research focused on written registers. Biber's study, for example, contains more referential, personal and directive bundles typical of spoken discourse. The present study adopted the functions used by Hyland (2008b:13-14) as the focus is on academic writing. The three main categories of these functions are listed below, with examples of each subcategory¹⁸:

Research-oriented

Location	(<i>at the beginning of, at the same time</i>)
Procedure	(<i>the role of the, the purpose of the</i>)
Quantification	(<i>a wide range of, one of the most</i>)
Description	(<i>the size of the, the structure of the</i>)
Topic	(<i>the social learning theory</i>)

Text-oriented

Transition	(<i>in addition to the, in contrast to the</i>)
Resultative	(<i>as a result of, it was found that</i>)
Structuring	(<i>in the next section, as shown in figure</i>)
Framing	(<i>in the case of, with respect to the</i>)

¹⁸ A description of each function is provided in Chapter 2 (Table 2.2, §2.3.5.2).

Participant-oriented

Stance	(it is possible that, are likely to be)
Engagement	(it should be noted, as can be seen)

(Hyland, 2008b:13-14.)

Although it had been anticipated that Hyland's framework would require some adaptation to suit the data gathered in the course of this study as the lexical bundles are specific to the field of psychology, it was found that the functional categories identified by Hyland generally corresponded to the functions performed by lexical bundles in the psychology and IELTS corpora. There were cases, however, in which the allocation of bundles to functions was not straightforward, as discussed in Chapter 2 (§2.3.5.2). Examples of this include *in the area of* and *as part of the*, both of which could be classified as either location or description, as illustrated in the concordance lines below:

conference in Atlanta in 1997 was that she used to work in the area of developmental psychology, but did not
noted the impressive predictions that could be made in the area of educational achievement for undergraduate
children to change their attitudes and reported practices in the area of personal dental hygiene practices. Other
this article is to argue in favour of a research methodology in the area of reading skills training that will concentrate
in other urban, national contexts. Very often, especially in the area of urban crime or delinquency, the bulk of

Figure 3.6: Concordance lines from the published corpus for *in the area of*

branch of the Indo-European family, began the century as part of the Austro-Hungarian Empire. Between world
in terms of being black, they are defining themselves as part of the majority of the population which has
is central to national discourse. It must be recognised as part of the new nation, and is not separate from the
of psychological and physical health were completed as part of the online survey prior to the in-person interview
seen as better, not just different. In this domain, parents, as part of the socialization process, engage children in

Figure 3.7: Concordance lines from the published corpus for *as part of the*

Although the allocation of function was based on the analysis of cotext by means of concordance lines, the fact that these bundles are largely abstract and so do not lend themselves to literal interpretation means that the categorisation of such bundles is a high-inference procedure. An additional challenge is the general lack of fine-grained analyses of functions in the literature, and, concomitantly, the absence of more detailed justification for the allocation of lexical bundles to particular categories. An example of this is Hyland's use of *the magnitude of the* to illustrate quantification, but *the size of the* to illustrate description (Hyland, 2008b:13). An adaptation made in my study to Hyland's taxonomy as a result of inherent ambiguities was the broad interpretation of the research-oriented subcategory 'description'. While certain functions are fairly easy to identify, such as resultative and stance bundles, description was found to be one of the more difficult, and so was broadly applied as a 'wastebasket' category. For example, the bundle *to be associated with* was classified as

description on the grounds that it expresses a relationship between concrete or abstract objects, but is not text-oriented, and so cannot be categorised as transition.

In a tentative attempt to further refine the features in terms of which the rhetorical functions of bundles may be distinguished, I would suggest that text-oriented bundles may generally be seen as self-referential or internal to the text, while research-oriented bundles may be regarded as having external reference. As a further means of identifying text-oriented bundles, both *to the extent that* and *to the fact that* were classified under the sub-category framing as the first bundle performs a hedging function, while the second relates to argumentation. The identification of characteristics such as these may assist further in the clarification of the descriptors associated with each function.

The different structures and functions described here were used as the basis for the analysis of the lexical bundles in all three corpora. It should be noted, however, that no instances of the research-orientated function ‘topic’ were identified in any of the three corpora as all context-based and topic-specific bundles had been removed (§3.5.2.3).

In addition to the quantitative analysis described above, the students’ use of lexical bundles was explored through a qualitative study aimed at identifying any evidence of a relationship between the appropriateness of lexical bundle use and students’ academic performance. As ‘appropriateness’ was defined in this context as an assessment of the ‘standard’ use of lexical bundles, it was operationalised in terms of accuracy of usage in relation to the use by published writers (§3.2). Investigation into this aspect then required in-depth analysis of ‘standard’ as well as ‘non-standard’ lexical bundles by means of concordance lines (§3.5.2.3).

The overarching term used in this study to refer to such ‘non-standard’ forms is the more politically neutral ‘idiosyncratic’. Van der Walt and Van Rooy (2002:114) point out that “the word ‘standards’ has been a sensitive and controversial one ... in South Africa” as the norms of Black South African English (BSAfE) have yet to be established. The sensitivity around the use of the word ‘standard’ relates to the inherent elitism and discrimination in regarding the ‘accepted standard’ as that closest to standard British English (Webb, 1996, cited in Van der Walt and Van Rooy, 2002). For this reason, any variations from the standard must be identified with caution, and the distinction clearly drawn between error and “conventionalised innovation” (Van Rooy, 2011). It should be noted, however, that the terms ‘non-standard’ and ‘error’ continue to be used in the linguistic analysis of both New and Learner Varieties based on factors such as frequency and stability. Van Rooy’s (2013) work on a corpus of BSAfE has meant that patterns can be discerned in the establishment of this New Variety. These trends

serve to distinguish between performance errors which “represent a small minority of variants that differ from the majority variants in the data” (Van Rooy, 2013:15) and more stable features which have a high frequency and are used more systematically. The various types of idiosyncratic forms that occur in the student corpus were categorised along a continuum, from the more serious grammatical and semantic errors (**women’s job have* and **however hence their fear of being obese*) to the less serious, such as unusual collocations, defined by Hyland (2008a) as being grammatically correct but not typical in a particular context (*accurate intervention* and *play a huge role*). Also included is the lexical bundle *with regards to the* which is used fairly broadly, and may be considered possible evidence of a new norm (§4.3.5.1).

Once idiosyncratic uses by students had been recorded, they were analysed with a view to positing a framework that distinguishes types of idiosyncratic uses: those that are stylistically different from the standard form used by published writers but nevertheless convey the intended meaning (**in the matter of* – used in a non-legal sense), and those that are erroneous in either form or function, given the context (e.g. **in the consequence of*), and are therefore likely to impede the comprehension of meaning. These differences in lexical bundle form and function, whether based on erroneous, non-standard uses or stylistic variation, were identified by means of the application of ‘keyness’. The WST program identifies ‘keyness’ in lexical bundles as those that have significantly different densities of occurrence in two selected corpora.

The reasons for examining keyness were threefold: firstly, to identify those lexical bundles with significantly different densities in the student and published corpora, as well as in the various student corpora (e.g. L1 vs AL speakers and 1st years vs 3rd years). Secondly, to assess particular differences in features such as modals, passive structures, anticipatory *it* structures and existential *there* constructions, as studies such as that by Ädel and Erman (2011:86) have found that the way in which these features are used in lexical bundles typically distinguishes student and published writing. These grammatical features were investigated in the course of analysing the structural differences between lexical bundles in the student and published corpora, as discussed below in the description of structures and functions. The third reason for examining keyness was to help bring to light lexical bundles that are irregularly formed in that they do not conform to the standard pattern, for example, the use of **to a little extent* rather than the more standard *to a certain extent*. The context in which such uses occur was identified by means of concordance lines derived in this case from a search for occurrences of the keyword *extent*, with the words positioned immediately to the left of the keyword assessed for expected collocational pairing. Another example would be the omission of the article from the lexical bundle *on the one hand*, which again can be identified by means of inspection of a

concordance based on the keyword *hand*. In the case of bundles with fixed frames (§2.3.6.1), the word in the bundle that has the lowest frequency and is, if possible, a content word would be used as the primary search term. For example, for the bundles *on the one hand, as a result of* and *one of the most*, the primary search terms would be 'hand', 'result' and 'most'.

In addition to the analysis of keyness differences between student and published corpora as well as between the different groups of students, a further qualitative investigation was conducted into the use of lexical bundles by the 19 interviewees. While the number of lexical bundles used by this group was investigated and compared to their academic results, the contextual use of bundles by this group was examined in depth by means of concordance lines. The interviewees, in addition to answering interview questions, were asked to complete four short vocabulary tests (§3.5.2.3a), three of which were aimed at assessing their understanding of lexical bundles. The results of these tests were compared to the density of lexical bundle use in their essays by means of the Pearson correlation. The relationship between proportional use of lexical bundles and students' academic performance at undergraduate level as measured by essay results was also investigated on the grounds that the issue of whether there is a direct link between perceived proficiency and density in lexical bundle usage remains unresolved. As this issue may be key to overall performance by students, it therefore requires investigation, with the view to addressing the acquisition of lexical bundles by both L1 and AL speakers should it be found to impact on successful essay writing within the university context.

A summary of the methodology applied in the study of both high-level vocabulary and lexical bundles is presented below as an overview of the various strands within the quantitative analyses and qualitative investigations. In addition to comparing the results of the vocabulary tests with the participants' essay results, the use of academic vocabulary and lexical bundles by AL students was compared with the occurrence of these lexical items in the writing of L1 students and published writers, taking into consideration density of use as well as examples of idiosyncratic usage and collocational pairings in the case of academic vocabulary, and idiosyncratic phrasing in the case of lexical bundles. Similarly, the use of academic vocabulary and lexical bundles by first-year students was compared with that of third years as well as with that of published writers. In the case of the lexical bundles, the studies were conducted by means of keyness analyses as well as 'manual' scrutiny of concordance lines, as discussed earlier (§3.5.2.3).

The various aspects of the comparisons to be conducted in the course of the analyses have been broken down into three separate components. The first of these focuses on the different aspects of vocabulary, as represented in Figure 3.8 below:

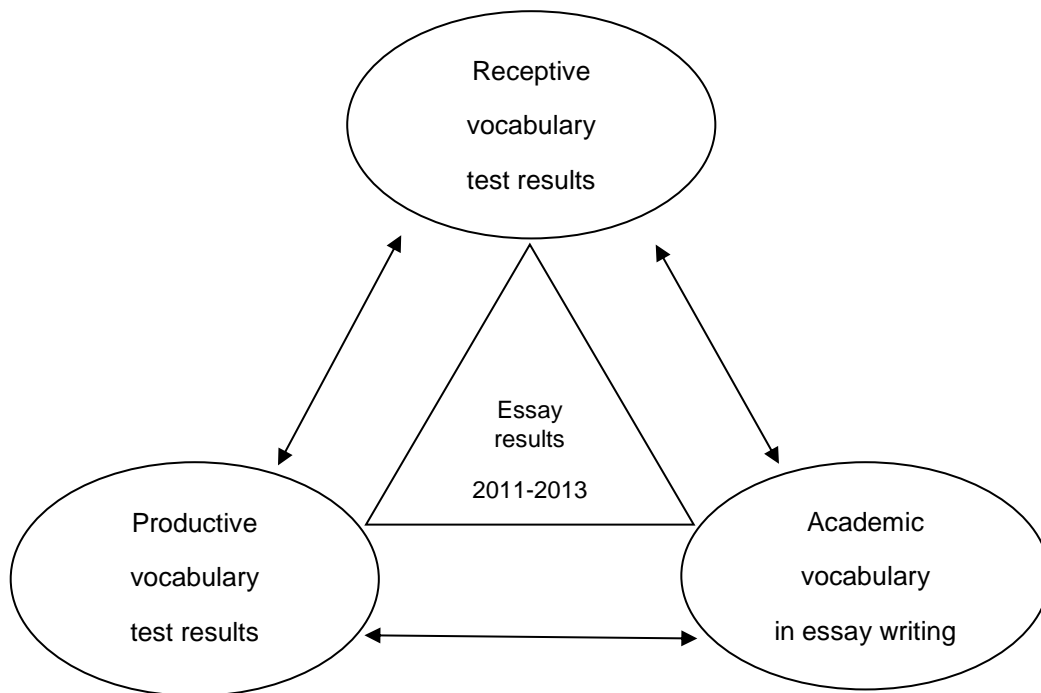


Figure 3.8: Overview of assessment of vocabulary items

The second primary component within this study is the focus on aspects of lexical bundles. The interrelations between the various variables to be investigated are illustrated below:

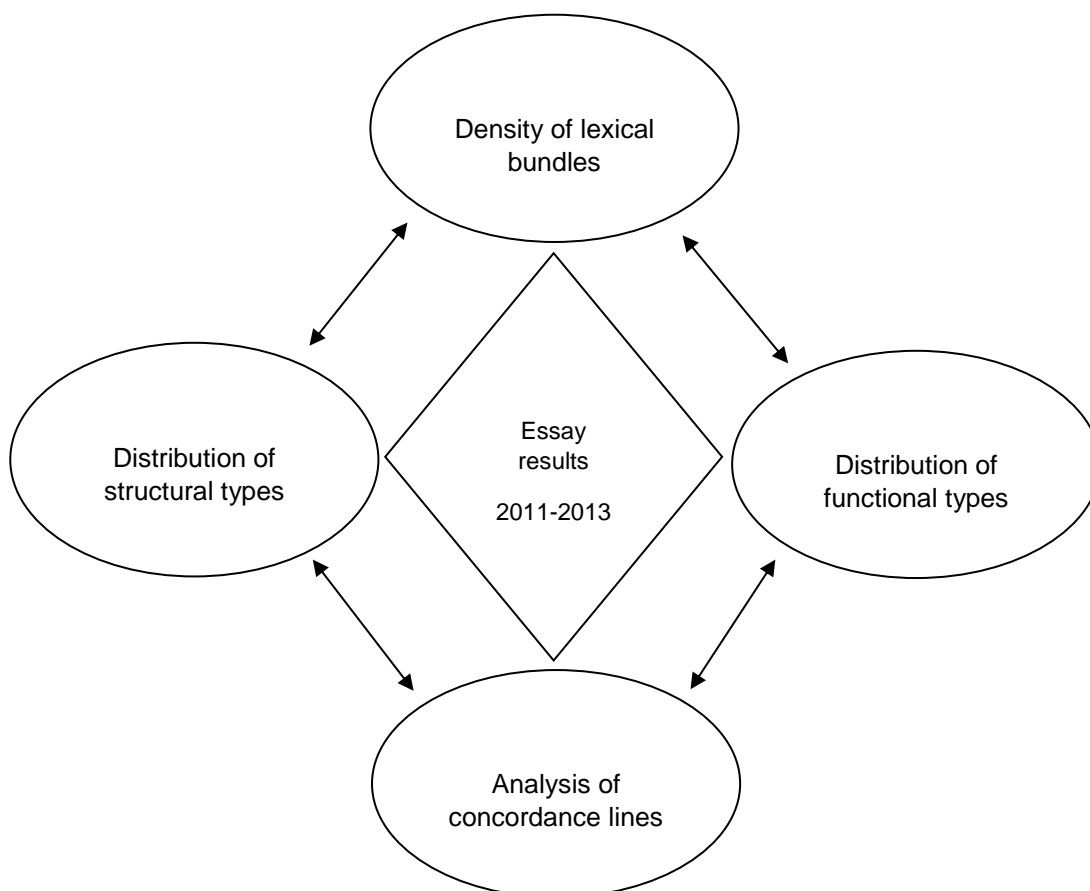


Figure 3.9: Overview of assessment of lexical bundles

The third diagram illustrates the interactions between the various subject groups which are analysed in terms of both vocabulary and lexical bundle use. These relationships are presented in Figure 3.10 below:

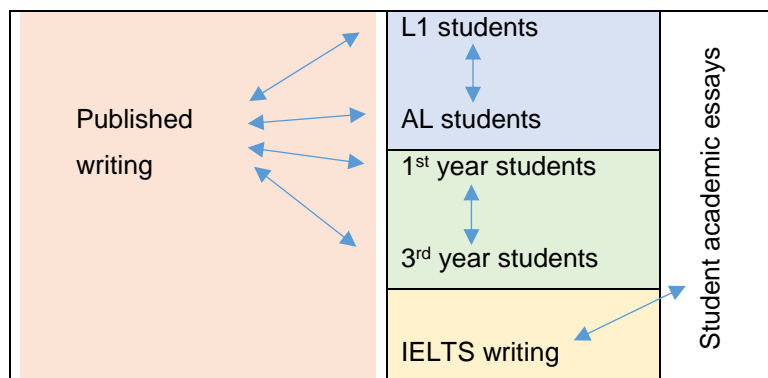


Figure 3.10: Overview of varying subject profiles to be compared

An additional aspect of this research project, conducted at the end of the participants' third year of undergraduate study, was a number of interviews. The approach to these interviews is explained in the next section.

3.5.2.4 Interviews

Volunteers from the research cohort were requested to come in for an interview during October and November, 2013, when the group of participants were completing their undergraduate degrees. Twenty students volunteered, and each spent an hour on average answering the vocabulary test questions as well as the interview questions. Each volunteer was offered a sandwich or muffin with coffee or fruit juice from the cafeteria, and was given a letter of recommendation stating that they had been prepared to donate their time in the interests of assisting with this research project. These students were asked to sign a consent form, provide demographic details such as their gender, age, nationality and home language, complete four vocabulary tests (§3.5.2.3a), and answer the interview questions (Appendix O).

The aim of these interview questions was to establish the students' views on their own academic writing and reading skills, as well as to determine whether they experienced problems with any particular aspects of the vocabulary in their reading material, whether they were at all aware of the concept of lexical bundles, clusters or phrases, and, if so, to what degree they perceived their use of these bundles as different from those in textbooks and journal articles. It was anticipated that the answers to these questions would assist in the

interpretation of data from the analysis of the lexical bundles in relation to the students' academic performance on their essays, and so help to triangulate the findings of this study.

Following the comparison of the density of academic vocabulary and lexical bundle use in student essays and in IELTS writing test answers, students' test scores on the writing and reading components of the IELTS test were compared to their academic results. This aspect of the study is described in the next section.

3.5.2.5 IELTS tests

In addition to the vocabulary tests, participants completed the reading and writing components of an IELTS test, as described earlier (§3.5.2.2). The primary aim of conducting these IELTS tests was to determine the degree to which the IELTS reading and writing results serve to predict students' academic performance, as well as to investigate similarities and differences between the use of academic vocabulary and lexical bundles in the IELTS Task 2 writing test and in the students' undergraduate essays. Although both the receptive vocabulary test and the IELTS tests were conducted at the start of the 2011 academic year, the IELTS reading and writing tests were conducted in a single session while the vocabulary test was conducted in the same tutorial slot one week later.

Task 2 of the writing test was selected for analysis rather than Task 1 on the basis of the style of writing required for each task (§2.4), as well as the length and different weightings allocated to each. While Task 1 requires candidates to describe a chart, table or graph in 150 words or more, Task 2 elicits discursive writing as candidates are required to present their opinions on a topic such as 'the possible introduction of compulsory community service for all those in secondary school' in at least 250 words. Although each of the four skills in the IELTS test (reading, writing, listening and speaking) are weighted equally (25% of the total), Task 2 of the writing test counts towards two-thirds of the total writing mark. Task 2 is therefore more important as it is closer to the expository style of writing required by academic essays within the field of social sciences, is two-thirds longer and, correspondingly, more heavily weighted. In addition, typical lexical features in Task 1 include fixed phrases such as *an increase/decrease in the*, *a general trend* and *a slight fluctuation*. Task 2, on the other hand, provides more opportunity for the use of words and phrases that serve, for example, transition, resultative and framing functions such as *in addition to*, *as a result of* and *in the case of*, and which are therefore more likely to be used in the academic register of the undergraduate psychology essay.

The IELTS reading test was taken from among a number of standard IELTS reading tests provided as free practice material on the Internet¹⁹. This reading comprehension test contains three texts, with 40 questions based on the three texts (Reading passage 1: Questions 1-13, Reading passage 2: Questions 14-26, and Reading passage 3: Questions 27-40). The questions require either one-word answers (yes/no/not given or true/false/not given) or matching (Appendix I). Participants were given 100 minutes in which to complete both reading and writing components, with 60 minutes for the reading test and 40 minutes for the writing test. However, as many of the L1 students completed the reading component in less than one hour, they were permitted to continue straight on to the written component.

The Task 2 writing component of the IELTS test was also downloaded from free practice material on the same IELTS exam practice test site. As described earlier (§3.5.2.2), the students were asked to write about the following topic in order to obtain answers to a typical IELTS Task 2 writing test:

Some people believe that a university education should be available to all students.

Others believe that higher education should be available only to good students.

Discuss these views. Which view do you agree with? Explain why.

As mentioned previously, students were given 40 minutes for this task, and were asked to write a minimum of 250 words in response (Appendix J). These writing tests were distributed amongst a number of English teachers who marked the tests following guidelines on the IELTS criteria for each band score²⁰. On completion of the marking, each teacher submitted the tests to an IELTS examiner who randomly selected 10% of the papers for moderation. As a means of measuring the use of lexical items in these writing tests, they were then assessed in terms of the occurrence of academic vocabulary items in addition to the density, structures and functions of the lexical bundles used.

The scores for the reading and writing components of the IELTS test were compared to each student's vocabulary test results and their overall academic performance by means of Pearson's correlation coefficient (r). The objective was to establish the extent to which the IELTS sub-scores and vocabulary scores correlate with academic performance.

¹⁹ http://www.ielts-exam.net/practice_tests/35/IELTS_Reading_Passage_1/293/

²⁰ http://www.examenglish.com/IELTS/IELTS_Writing_MarkSchemes.html

In the conclusion to this description of the methodology used, a summary of the primary aspects of the study is provided before moving on to a more detailed discussion of each specific hypothesis in Section 3.6.

3.5.2.6 Conclusion

In order to provide an overview of the key elements within each hypothesis as well as of the relevant interrelationships between variables, a summary of the analyses conducted for each of the nine main hypotheses in this study is provided in Table 3.10 below:

Hypotheses	Independent variables	Dependent variables	Primary data sources
Hypothesis V1	Academic and low frequency vocabulary	Academic performance	Vocabulary test results AWL ²¹ tokens in student essays Essay results
Hypothesis V2	Use of academic vocabulary in L1 and AL student writing	Use of academic vocabulary in published writing	AWL tokens in student and published corpora
Hypothesis V3	Use of academic vocabulary in 1 st and 3 rd year student writing	Use of academic vocabulary in published writing	AWL tokens in student and published corpora
Hypothesis V4	Use of academic vocabulary in IELTS writing tests	Use of academic vocabulary in essay writing	AWL tokens in student essay and IELTS corpora
Hypothesis LB1	Lexical bundles (LBs)	Academic performance	Density of LBs Essay results
Hypothesis LB2	Use of LBs in L1 and AL student writing	Use of LBs in published writing	Density of LBs Distribution of structural and functional types

²¹ Coxhead's (2000) Academic Word List

Hypotheses	Independent variables	Dependent variables	Primary data sources
Hypothesis LB3	Use of LBs in 1 st and 3 rd year student writing	Use of LBs in published writing	Density of LBs Distribution of structural and functional types
Hypothesis LB4	Use of LBs in IELTS writing tests	Use of LBs in essay writing	Density of LBs Distribution of structural and functional types
Hypothesis IE	IELTS reading test results IELTS writing test results	Academic performance	IELTS reading and writing test scores Essay results

Table 3.10: An overview of the analyses conducted for each hypothesis

The next section presents an overview of the analytical framework and statistical procedure(s) by means of which each hypothesis was tested.

3.6 Analytical and statistical procedures

The assumption underlying the broad research aim (§3.2) is that both vocabulary proficiency and the appropriate use of lexical bundles relate positively to overall academic performance. Following from this are several operational hypotheses, each of which is discussed in detail below.

3.6.1 Vocabulary and performance (HV1)

HV1 (Vocabulary and performance hypothesis)

Students who perform well on measures of vocabulary proficiency are more likely to perform well academically.

Two operational hypotheses were formulated to address different aspects of this main hypothesis, namely, the relationship between the use of academic vocabulary in student writing and academic performance, and the relationship between vocabulary test results and academic performance. Hypothesis V1a is expressed as follows:

HV1a Vocabulary (essay) and performance hypothesis:

There is a positive relationship between the density of academic vocabulary in student writing and the students' academic performance, as measured by their essay results.

Academic vocabulary refers to a fairly wide range of words that occur regularly throughout academic texts across all disciplines, and are not commonly found in non-academic texts. The features of academic vocabulary are then that these items:

- (a) [are] reasonably frequent in most academic texts from a wide range of academic disciplines,
- (b) [are] relatively infrequent in other types of texts such as novels or colloquial spoken texts,
- (c) [come] largely from French, Latin or Greek, and (d) [are] not obviously connected with any one subject area.

(Wang Ming-Tzu and Hyland, 2004:292.)

For operational purposes, academic vocabulary is defined in the context of this study as those lexical items which are listed in Coxhead's (2000) Academic Word List (AWL) (§2.2.1 and §3.5.2.3a). In order to analyse this hypothesis, then, the percentage of AWL tokens in each student's essay was compared with that student's essay result.

Within the context of Hypothesis V1a, *density* was thus measured as the percentage of items from the AWL that occur in the student essays. The analysis focused on tokens rather than types in order to be able to distinguish the actual number of different academic words used in each text from repeated uses of a single item. Cobb's (2002) VocabProfile program was used to identify the number of academic vocabulary items that occur, and to measure this occurrence as a percentage. The Pearson product-moment correlation was then used as the statistical measure to compare the percentage of academic vocabulary with the result for each of the first-, second- and third-year psychology essays. The reason for the selection of the Pearson test was that "it allows us to look at two variables and evaluate the strength and direction of their relationship or association with each other" (Dörnyei, 2007:223).

Academic performance was measured in terms of students' results for their written essays in psychology obtained over the course of their undergraduate degree, from their first year in 2011 to their third year in 2013. It must be noted at this stage that one of the principles underlying this study is that, while both essay results and final overall year marks serve as measurements of academic performance, the essay results are employed as the dependent variable in this study. There are a number of arguments to support this position, including the fact that the student data (that is, high-level and academic vocabulary, as well as the lexical

bundles) were drawn from the essays which form 40 per cent of the overall year mark and so constitute a sizeable proportion of the year mark. Furthermore, the tests and examinations which form the remainder of the year mark were not analysed in the course of this study, and so contain a number of unknown variables which cannot be accounted for. The concluding argument for referring only to the essay results as a measure of academic performance is the results of a Pearson test conducted to determine the correlation between the two sets of measures for the 160 participants' essay results and final overall year marks for PSY100, PSY200 and PSY300. These results are presented in Table 3.11 below:

	N	Mean	Std. deviation	Pearson (r)
PSY100 essay average	160	69.32	7.24	.735**
PSY100 final result	160	66.77	9.29	
PSY200 essay average	160	68.33	6.93	.758**
PSY200 final result	160	65.78	7.58	
PSY300 essay average	160	68.21	7.30	.845**
PSY300 final result	160	67.67	8.73	

** . Correlation is significant at the 0.01 level.

Table 3.11: Pearson correlation test results showing the relationship between students' essay averages and overall year marks

The results of the Pearson test reflect a high correlation between the two sets of results. Reference to Mulder's (1982) framework for the description of correlation coefficients supports this interpretation of the results:

- 1,00 – perfect correlation
- 0.80 to 0.99 – very high correlation
- 0.60 to 0.79 – high correlation
- 0.40 to 0.59 – moderate correlation
- 0.20 to 0.39 – low correlation
- 0.01 to 0.19 – very low correlation
- 0.00 – no correlation

(Mulder, 1982:73)

The high correlations for both sets of results in the first and second years, and very high correlation in the third year, suggests that it may be fair to assume a strong relationship between the students' essay results and their overall year marks, further corroborating the argument for assessing academic performance only in terms of the essay results.

Following the explanation given above of the approach to testing HV1a, an overview of the data analysed and statistical procedures followed is presented in Table 3.12:

Data analysis	Procedures
<p>Density of AWL tokens in essays – measured by means of the VocabProfile in terms of percentage of tokens</p> <p>Psychology essay results:</p> <ul style="list-style-type: none"> ➤ from PSY100 (2011), PSY200 (2012) and PSY300 (2013) 	<p>Pearson (r):</p> <ul style="list-style-type: none"> ➤ each student’s essay result is compared to the percentage of AWL tokens for that essay

Table 3.12: Overview of the analyses conducted for Hypothesis V1a

While the focus of HV1a is on the students’ use of academic vocabulary in their essays, the next operational hypothesis investigates the relationship between vocabulary test results and essay results.

HV1b Vocabulary (test) and performance hypothesis:

There is a positive relationship between students’ results on tests of academic and high-level vocabulary and their academic performance, as measured by their essay results.

As the focus of *HV1* is on measures of students’ vocabulary, the analysis of Hypothesis V1b was intended to provide additional information on the nature of the relationship between the students’ results on receptive and productive vocabulary tests at the 5000-word, academic and 10 000-word frequency levels, and their academic performance as measured by their essay results. While the main focus was on academic vocabulary, the possible influence of the 5000 and 10 000 frequency levels on academic performance was also considered.

The Pearson correlation was also used in this case to compare the results of the receptive and productive vocabulary tests across the different frequency levels with the average results of the psychology essays for each set of first-year, second-year and third-year essays submitted over the course of the year. An overview of the analyses conducted for HV1b is presented in Table 3.13 below:

Data analysis	Procedures
Receptive vocabulary test results: <ul style="list-style-type: none"> ➤ 5000, AWL, 10 000 Productive vocabulary test results: <ul style="list-style-type: none"> ➤ 5000, AWL, 10 000 Essay averages of students per year: <ul style="list-style-type: none"> ➤ from PSY100 (2011), PSY200 (2012) and PSY300 (2013) 	Pearson (r): <ul style="list-style-type: none"> ➤ compare the three sets of receptive vocabulary test results with essay averages per student from PSY100, PSY200 and PSY300 ➤ compare the three sets of productive vocabulary test results with essay averages per student from PSY100, PSY200 and PSY300

Table 3.13: Overview of the analyses conducted for Hypothesis V1b

Following these procedures, multiple regression was used to determine the relationship between the six vocabulary test scores and the students' academic performance. Multiple regression (R) is used to determine "the degree to which various combinations of independent variables correlate with the dependent variables" (Brown, 1988:148). The aim of this procedure, then, is to predict the value of the dependent variable (academic performance) from the values of the independent variables²² (in this case the results of the receptive and productive vocabulary tests). The results of this analysis should indicate the degree to which each of the frequency levels in the two types of vocabulary tests serves as a guideline to how well students are likely to perform at undergraduate level.

While the first two operational hypotheses focus on students' understanding and use of academic vocabulary in relation to academic performance, the focus of HV2 and HV3 shifts to the use of academic vocabulary in student and published writing.

3.6.2 Vocabulary and language (HV2)

HV2 (Vocabulary and language hypothesis)

First language students' use of academic vocabulary will approximate that of published writers more closely than will that of additional language students.

Given the premise that there are distinctions in the use of academic vocabulary by students and by published writers (Chen and Baker, 2010; Cortes, 2004; Hyland, 2008a), the aim of this

²² An independent variable is "selected and systematically manipulated by the researcher to determine whether, or the degree to which, it has any effect on the dependent variable" (Brown, 1988:11).

hypothesis is to compare the use of academic vocabulary in student writing by first-language speakers of English (L1) with their use by students for whom English is an additional language (AL). The framework for this comparison is the way in which academic vocabulary is used by published writers.

HV2a Vocabulary (density) and language hypothesis:

There is less difference between the density of occurrence of academic vocabulary used by first language (L1) students and published writers, than between the density of occurrence of academic vocabulary used by additional language (AL) students and published writers.

As in HV1a (§3.6.1), density is measured in terms of the proportion of one particular type of vocabulary item, in this case academic vocabulary as defined in terms of the Academic Word List (Coxhead, 2000), to the overall number of words in the text. In order to assess the validity of this hypothesis, the percentage use of items from the AWL was calculated in relation to the total number of words, using Cobb's (2002) VocabProfiler. This calculation was done for the AWL tokens within three corpora: the essays written by L1 students, the essays written by AL students, and the published writing. The division of students according to language background was based on the results of the demographic survey, as described earlier (§3.5.1). Following the calculation of percentages of AWL tokens for each corpus, the percentages in the L1 and AL corpora were compared with those in the published corpus in order to determine whether there was a significant difference between the corpora of AL students and published writers that could confirm the hypothesis.

It is important to note that, while the focus of this study is on comparisons between students grouped by language background (first language and additional language speakers) as well as by academic level (high and low achievers), the published corpora served as the benchmark. In a comparable study, Scheepers (2014:97) examined aspects of student writing in relation to an 'expert' corpus of peer-reviewed writing on the grounds that "the Expert corpus is regarded as a model of the sort of academic writing to which undergraduates at this level should aspire". Paquot (2010:72) presents arguments on the comparison of student writing to academic prose. On the one hand, expert writers are regarded as presenting an "unrealistic standard" (Hyland and Milton, 1997:184). On the other hand, while student writing provides a fairer comparison, it is not always the best model of language usage. The line taken in this study is that both student and expert or published corpora play a role in the analysis of writing for materials development. While student writing illustrates language problems typical of both novice and non-native learners, published corpora provide a model for more advanced learners. In support of this argument, Flowerdew (2001, in Gilquin, Granger and Paquot, 2007:322) expresses the

viewpoint that “insights gleaned from learner corpora need to be employed to complement those from expert corpora”. The decision to use the published corpus as a benchmark against which to compare students’ use of lexical features while at the same time comparing the writing of more experienced and L1 students with novice and non-native speakers follows an argument presented by Cortes (2004:421) that ways should be sought to “bridge the gap between published writing and student writing in academic disciplines”. The comparison of academic vocabulary and lexical bundle use in student writing to that in published writing should serve to partially address this gap as comparisons of this nature “indicate not only the distance learners need to travel to reach target community standards, but ... provide specific information about what they ... need to do to achieve this” (Hancioğlu, Neufeld and Eldridge, 2008:473).

A summary of the data and statistical procedures applied in HV2a is presented below:

Data	Statistical procedure
Density of academic vocabulary in the L1 student corpus, AL student corpus and published corpus – measured by means of the VocabProfile in terms of percentage of tokens	Independent samples <i>t</i> -test: <ul style="list-style-type: none"> ➤ percentage of words that are AWL tokens (L1 vs AL corpora) One sample <i>t</i> -tests: <ul style="list-style-type: none"> ➤ percentage of words that are AWL tokens (L1 vs published corpora) ➤ percentage of words that are AWL tokens (AL vs published corpora)

Table 3.14: Overview of the analyses conducted for Hypothesis V2a

As with the previous hypothesis, the focus of HV3 is on students’ use of academic vocabulary in relation to that of published writers. However, while HV2 considered the use of academic vocabulary by first and additional language speakers, HV3 compares the use of these items by first- and third-year students.

3.6.3 Vocabulary and year (HV3)

HV3 (Vocabulary and year hypothesis)

Third-year students’ use of academic vocabulary will approximate that of published writers more closely than will that of first-year students.

The assumption underlying this hypothesis is that there is a gradual improvement in students’ general vocabulary proficiency over the course of their undergraduate studies, and that this

includes improvement in the use of academic vocabulary. The difference in proficiency would therefore be greatest between the third-year students and the first-year students, with students in second year having more proficiency than the first-year students, but less than the third-year students. As with Hypothesis V2, the framework for this comparison is the way in which academic vocabulary is used by published writers.

HV3a Vocabulary (density) and academic year hypothesis:

There is less difference between the density of occurrence of academic vocabulary used by third-year students and published writers, than between the density of occurrence of academic vocabulary used by first-year students and published writers.

The aim here is to explore the extent to which there is development in students' use of academic vocabulary over the course of a three-year undergraduate degree. As in the case of Hypothesis V2a (§3.6.2), the density of academic vocabulary is measured as a proportion of AWL items used within a specific length of text. The items from the AWL are identified in terms of tokens, again to distinguish individual vocabulary items from those that are used repeatedly (§3.6.1) The percentage of academic vocabulary used was measured by means of Cobb's (2002) VocabProfiler in three corpora: the essays written by first-year students, the essays written by third-year students, and the journal articles written by published writers within the field of psychology. Following this calculation of AWL tokens for each corpus, the percentages from the various corpora were compared in order to assess the validity of this hypothesis. The density of academic vocabulary used by published writers was compared firstly to the density of this vocabulary in the writing of first-year students, and secondly to the density of this vocabulary in the writing of third-year students. The statistical procedure used for both sets of comparisons was the t-test. A summary of the data and statistical procedures applied in HV3a is presented below:

Data	Statistical procedure
Density of academic vocabulary in the 3 rd year student corpus, 1 st year student corpus and published corpus – measured by means of the VocabProfile in terms of percentage of tokens	Paired sample <i>t</i> -test: <ul style="list-style-type: none"> ➤ percentage of words that are AWL tokens (1st year vs 3rd year corpora) One sample <i>t</i> -tests: <ul style="list-style-type: none"> ➤ percentage of words that are AWL tokens (1st year vs published corpora) percentage of words that are AWL tokens (3rd year vs published corpora)

Table 3.15: Overview of the analyses to be conducted for Hypothesis V3a

The last hypothesis relating to academic vocabulary moves away from differences between various student groups and published writers, and focuses on a comparison between the vocabulary used in the IELTS writing test and in student academic writing.

3.6.4 Vocabulary and IELTS (HV4)

HV4 (Vocabulary and IELTS hypothesis)

Students' use of academic vocabulary in their essays will approximate their use of academic vocabulary in the writing component of the IELTS test.

This hypothesis is based largely on the assumption that one of the reasons the IELTS test may predict academic performance to some extent is that the written component of the IELTS test and academic writing share similar lexical features. The analyses conducted in this section focus on comparisons between the academic results at first and third year levels, and the IELTS test answers. The reason the second-year results are not included is that there on average is a higher failure rate at the end of the first year than at the end of the second year, indicating that the first year is more critical in terms of throughput, while the third year results are a measure of overall academic success since this is the final year of the undergraduate degree. Measures of academic performance are therefore most applicable in the case of first year and third year.

HV4a Vocabulary (density) and IELTS hypothesis:

There is a positive relationship between the density of academic vocabulary used by students in the IELTS writing tests and in their essays.

As the IELTS test is currently used by Wits University as one of the selection criteria in terms of which non-English speaking international students are granted access to the University (§2.4), it follows that the IELTS writing test may be expected to measure students' ability to write in the style of the student essay. This section of the study therefore investigated the extent to which the use of academic vocabulary in the IELTS writing test answers overlaps with that in academic essays.

As in Hypothesis V1a (§3.6.1), density refers to the proportion of academic vocabulary items in relation to the total number of words in the text, and was therefore calculated as a percentage. Academic vocabulary was operationalised as those items in Coxhead's (2000) Academic Word List, and AWL tokens were again identified by means of the VocabProfiler (Cobb, 2002). The IELTS writing tests and essays analysed for this study were those completed by participants who submitted both the IELTS Task 2 writing test as well as the

minimum number of essays required for inclusion in the study ($n = 148$) (§3.5.1; Table 3.4). The Pearson test was used to assess the relationship between the percentage of tokens used in the IELTS writing tests and in the first- and third-year essays.

A summary of the data and statistical procedures applied in HV4a is presented below:

Data	Statistical procedure
<ul style="list-style-type: none"> ▶ Density of academic vocabulary in PSY100 and PSY300 essays (average per student, per year) – measured by means of the VocabProfile in terms of percentage of tokens ▶ Density of academic vocabulary in the IELTS corpus – measured by means of the VocabProfile in terms of percentage of tokens 	Pearson (r): <ul style="list-style-type: none"> ➤ compare the average percentage of AWL tokens in PSY100 essays per student per year with the average percentage of AWL tokens in IELTS writing tests ➤ compare the average percentage of AWL tokens in PSY300 essays per student per year with the average percentage of AWL tokens in IELTS writing tests

Table 3.16: Overview of the analyses to be conducted for Hypothesis V4a

The five operational hypotheses which relate to academic (and in one case also to low frequency) vocabulary discussed above (§3.6.1 to §3.6.4) were designed to test various aspects of the relationship between students' understanding and use of this vocabulary, and their academic performance at undergraduate level. The focus now shifts to the parallel investigations into students' use of lexical bundles.

3.6.5 Lexical bundles and performance (HLB1)

HLB1 (Lexical bundles and performance hypothesis)

Students whose use of lexical bundles approximates that of published writers more closely are more likely to perform well academically.

While two operational hypotheses were developed to test HV1, in this case a single hypothesis was formulated in parallel with HV1a, aimed at exploring the relationship between the use of lexical bundles in student writing and academic performance. The primary reason for not having a hypothesis equivalent to HV1b was the unavailability of established lexical bundle tests and the limitations imposed by the scope of this study which did not allow for the development of such tests. Hypothesis LB1a is expressed as follows:

HLB1a Lexical bundles (density) and performance hypothesis:

There is a positive relationship between the density of target bundles in student writing and the students' academic performance, as measured by their essay results.

To address this hypothesis, the students' use of lexical bundles was investigated by means of Wordsmith Tools 6 (Scott, 2012), as discussed earlier (§3.5.2.3), and compared with their academic performance, as measured by their essay results. As for Hypotheses V1a, the first-year, second-year and third-year academic results were assessed separately on the basis of the average essay result per year. However, while it is possible to measure the percentage of academic words used by individual students, the application of WST for a computer-based count of lexical bundles requires the analysis of large amounts of text (§3.5.2.3b). As a result, the density of lexical bundle use was not calculated in terms of individual students but per group. For this reason, the statistical procedures implemented to test the hypothesis required that the students be grouped according to their academic performance. Group H refers to the high achievers (i.e. those whose results place them in the top third performers overall), while Group L refers to the low achievers (i.e. those whose results place them in the bottom third overall). As there were 160 participants in HLB1a (Table 3.4, §3.5.1), the top 54 and bottom 54 performers were identified in terms of essay results. These two sets of results were then analysed separately to determine the nature of the relationship between the density of lexical bundle use and essay results.

Density, as one of the key elements in HLB1a, was defined as the frequency of occurrence of lexical bundles within a specified number of words in a text, measured as a percentage. As with academic vocabulary, the reason for measuring the density as a ratio was to control for length of text. As in Cortes (2004), density was determined across essays ('inter-density') in order to avoid idiomatic overuse by individual students skewing the results. In order to determine whether there was a relationship between density of lexical bundles in student writing and the students' academic performance, the density differences between the high achievers and low achievers were tested for significance by means of a log-likelihood test. Log-likelihood, alternatively known as the G-square (G^2) statistic, is "a measure of error, or unexplained variation, in categorical models, based on summing the probabilities associated with the predicted and actual outcomes" (Field, 2005:736; 221). As it is a measure of difference, the higher the log-likelihood value, the more significant the difference between the two scores²³.

²³ Paul Rayson provides a scale in terms of which the significance of log-likelihood values can be interpreted:

- 95th percentile; 5% level; $p < 0.05$; critical value = 3.84
- 99th percentile; 1% level; $p < 0.01$; critical value = 6.63

The *target bundles* were the most frequently occurring lexical bundles in the published corpus (§3.5.2.3b). Of the 150 target bundles originally identified, 32 were excluded on the grounds that they were context-specific, technical or statistical terms (§3.5.2.3), leaving 118 for analysis. Following the identification of these target bundles in the published corpus, the student corpus of essay writing was examined for instances of the use of these particular lexical bundles. The percentage of target bundles in the first-, second- and third-year student corpora was then analysed in terms of academic performance by comparing the density per year for the high achievers to that of the low achievers, using the log-likelihood (LL) test. The aim of this test was to establish the degree to which the differences between high and low achievers were significant.

A summary of the data and statistical procedures applied in HLB1a is presented below:

Data	Procedures
<p>Target bundles</p> <ul style="list-style-type: none"> ➤ top 118 in published corpus ▶ Number of target bundles in Group H; total number of words in student corpus ▶ Number of target bundles in Group L; total number of words in student corpus 	<p>Log-likelihood test for significant differences between:</p> <ul style="list-style-type: none"> ▶ Group H: number of target bundles / total number of words in student corpus ▶ Group L: number of target bundles / total number of words in student corpus ➤ for PSY100, PSY200 and PSY300

Table 3.17: Overview of the analyses conducted for Hypothesis LB1a

In addition to the analysis of lexical bundles according to their density of occurrence within student essays, these bundles were examined in terms of the distribution of structural and functional types, and the relationship between this distribution of types and academic performance. This aspect of lexical bundle use was analysed in the course of investigating Hypotheses HLB2 and HLB3, as discussed in the next two sections.

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- 99.9th percentile; 0.1% level; $p < 0.001$; critical value = 10.83
 - 99.99th percentile; 0.01% level; $p < 0.0001$; critical value = 15.13

Rayson's log-likelihood and effect-size calculator: <http://ucrel.lancs.ac.uk/llwizard.html>

3.6.6 Lexical bundles and language (HLB2)

HLB2 (Lexical bundles and language hypothesis)

First language students' use of lexical bundles will approximate that of published writers more closely than will that of additional language students.

In keeping with the parallelism that links the vocabulary and lexical bundle hypotheses, the main hypothesis in this case relates to language background. While the corresponding vocabulary hypothesis had a single operational hypothesis, in this case three operational hypotheses were formulated to address the various facets of the main hypothesis. As the definition of lexical bundles hinges on occurrence within a range of texts (§2.3), the primary features used in their identification are frequency and distribution criteria. Within the three operational hypotheses under HLB2, the 'use' of lexical bundles is therefore measured in terms of density, variety of structural types and variety of functional types. The first of these relates to the density of lexical bundle use.

HLB2a Lexical bundles (density) and language hypothesis:

There is less difference between the density of occurrence of target lexical bundles used by L1 students and published writers, than between the density of occurrence of target lexical bundles used by AL students and published writers.

The approach to this hypothesis was similar to that of HLB1a in that the target bundles were identified by means of WST, and the operational definitions of *density* and *target bundles* were applied in the same way. However, instead of grouping the students according to academic year, they were grouped by language background. Analysis was therefore conducted following the division of students into first-language and additional language speakers, as for HV2a.

A further distinction between HLB1a and HLB2a is that, while the former focused on differences between student groups categorised according to academic year and performance, the latter compared the use of target bundles in the student corpora to that in the corpus of published writing, with the published corpus as benchmark. The log-likelihood technique was again applied to test for significant differences in bundle use between the L1 and AL students, as well as between each language group and the published writers. An overview of the analyses conducted for this hypothesis is presented below:

Data analysis	Statistical procedure
<p>Target bundles</p> <ul style="list-style-type: none"> ➤ top 118 in published corpus ▶ Number of target bundles in L1 corpus; total number of words in the student corpus ▶ Number of target bundles in AL corpus; total number of words in the student corpus ▶ Number of target bundles in published corpus; total number of words in the published corpus 	<p>Log-likelihood test for significant differences between:</p> <ul style="list-style-type: none"> ▶ L1 group: number of target bundles x 4 / total number of words in the student corpus ▶ AL group: number of target bundles x 4 / total number of words in the student corpus ▶ Group P: number of target bundles x 4 / total number of words in the published corpus <p>➤ L1 vs AL vs published</p>

Table 3.18: Overview of the analyses conducted for Hypothesis LB2a

Following the analysis of density of target bundles in the L1 and AL corpora in relation to the published corpus, the next two operational hypotheses explore the variety of structural and functional types of target bundles used by L1 and AL speakers, and compare these to the range of types which occur in the published corpus. Each operational hypothesis is addressed in turn.

HLB2b Lexical bundles (structures) and language hypothesis:

There are fewer differences in the structural types of target lexical bundles used by L1 students and published writers, than in the structural types of target lexical bundles used by AL students and published writers.

The expectation in this hypothesis is that the structural types used by L1 student writers are closer in form to those used by published writers than is the case for AL students. As for HLB2a, the target bundles in the L1 and AL student corpora were analysed using WST and compared to the target bundles used in the published corpus. However, while HLB2a explored the density of occurrence of target bundles, the focus of HLB2b was on the distribution of structural types in student writing in relation to published writing. Within this context, distribution should be understood to mean the number of each sub-category to occur within the range of structural types. The grammatical structures were identified in terms of the categories established by Biber et al. (1999), as discussed and illustrated earlier (§3.5.2.3b). For the purposes of this analysis, the four main categories of structural types were considered, that is, verb-based, noun-based, preposition-based and 'other'. This last category included any grammatical structure that did not have a noun, verb or preposition as the head of the bundle, such as

adverbial phrases, adjectival phrases, those headed by a modal, conjunction or dummy subject, and bundles with dependent clause fragments.

The proportion of types used from each subcategory was calculated for both student and published corpora, and the results compared using the Chi-square procedure. Chi-square tests are non-parametric tests that are used with nominal data, that is, when the dependent variable is categorical (Dörnyei, 2007). Levon (2010:74) describes the goal of Chi-square tests as determining whether the proportional distribution observed in the sample population is significantly different from any other population of the same size and shape.

In other words, Chi-square tests calculate what the distribution of variable values would be if the null hypothesis were true for our sample. They then compare this ‘null’ distribution to the distribution that we actually found in collecting our data, and determine whether the two are significantly different from one another.

(Levon, 2010:74.)

Jaworska et al. (2015) employed the Chi-square test to determine whether there was a significant difference in the distribution of n-gram functions between two corpora. Similarly, in Chen and Baker (2010), the aim of the Chi-square test was to assess whether there was a difference in the distribution of structural types across the student and published writing corpora. The distribution of these structural types was calculated in terms of their occurrence in each corpus, and both sets of student corpora compared to the published corpus to determine whether there is evidence of a significant difference between the AL and published corpora in particular that would support the hypothesis.

A summary of the data and statistical procedures applied in HLB2b is presented below:

Data analysis	Statistical procedure
Proportions of structural types in L1, AL and published corpora	Chi-square (plus Standardised Residuals): Distribution of four structural types in L1 vs AL vs published corpora

Table 3.19: Overview of the analyses conducted for Hypothesis LB2b

While HLB2b examined the occurrence of structural types in L1 and AL student writing, HLB2c investigated differences in the occurrence of functional types in these student corpora.

HLB2c Lexical bundles (functions) and language hypothesis:

There are fewer differences in the functional types of target lexical bundles used by L1 students and published writers, than in the functional types of target lexical bundles used by AL students and published writers.

As for HLB2b, the occurrence of lexical bundles was analysed by means of WST, and the 118 target bundles identified in the published corpus then formed the template in terms of which the functional types in the student corpora were assessed. Since this analysis was based on the taxonomy used by Hyland (2008b), the three main categories analysed were research-oriented, text-oriented and participant-oriented (§3.5.2.3b). The percentages in each corpus were then compared by means of Chi-square tests to determine the degree of difference between the use of the various functional types between the L1 corpus and the published corpus, as well as between the AL corpus and the published corpus.

Other than the analysis of functional rather than structural types, the operationalisation of key terms, method of analysis and statistical procedure followed in the investigation of this hypothesis was identical to that of HLB2b, as illustrated in the summary of the data and statistical procedures applied in HLB2c:

Data analysis	Statistical procedure
Proportions of functional types in L1, AL and published corpora	Chi-square (plus Standardised Residuals): Distribution of three functional types in L1 vs AL vs published corpora

Table 3.20: Overview of the analyses conducted for Hypothesis LB2c

Following the comparison of densities and distribution of structural and functional types of lexical bundles in the L1, AL and published corpora, the next set of hypotheses examine these aspects of lexical bundle occurrence in the writing of first- and third-year students.

3.6.7 Lexical bundles and year (HLB3)

HLB3 (Lexical bundles and year hypothesis)

Third-year students' use of lexical bundles will approximate that of published writers more closely than will that of first-year students.

As in the case of the parallel academic vocabulary hypothesis, the assumption here is that students' general lexical proficiency gradually improves over the course of their undergraduate studies as a result of exposure through reading and listening. This improvement includes the development of a broader range of lexical bundles common to the academic prose in their disciplines. The difference in proficiency should again be most evident between the third-year students and the first-year students. Since the students' use of bundles was measured in terms of the proportion of target bundles in their writing, the framework for this comparison was the way in which lexical bundles were used by published writers.

HLB3a Lexical bundles (density) and year hypothesis:

There is less difference between the density of occurrence of target lexical bundles used by third-year students and published writers, than between the density of occurrence of target lexical bundles used by first-year students and published writers.

As in HLB2a (§3.6.6), the WST program was used to identify lexical bundles in the relevant corpora. Given the focus on lexical bundle use by first years as opposed to third years, the three corpora examined for this hypothesis were the essays submitted by the first-year students, the essays submitted by the third-year students, and the published corpus of journal articles. Again, density is defined as the number of target bundles used relative to the overall number of words in the text, and calculated as a percentage. The target bundles in each of the student corpora were then compared to those in the corpus of published writers, using the log-likelihood technique to test for significance. An overview of the analyses conducted for this hypothesis is presented below:

Data analysis	Statistical procedure
<p>Target bundles</p> <ul style="list-style-type: none"> ➤ top 118 in published corpus ▶ Number of target bundles in 1st year corpus; total number of words in the student corpus ▶ Number of target bundles in 3rd year corpus; total number of words in the student corpus ▶ Number of target bundles in published corpus; total number of words in the published corpus 	<p>Log-likelihood test for significant differences between:</p> <ul style="list-style-type: none"> ▶ 1st years: number of target bundles x 4 / total number of words in the student corpus ▶ 3rd years: number of target bundles x 4 / total number of words in the student corpus ▶ Published: number of target bundles x 4 / total number of words in the published corpus <p>➤ 1st years vs 3rd years vs published</p>

Table 3.21: Overview of the analyses conducted for Hypothesis LB3a

Following the approach used in HLB2, the attention now turns from the density of lexical bundle use to the distribution pattern of structural types used by first-year and third-year students in relation to published writers. The aim of this operational hypothesis was to establish whether the range of structural types used by third-year students related more closely to that used by published writers than did the range used by first-year students.

HLB3b Lexical bundles (structures) and year hypothesis:

There are fewer differences in the structural types of target lexical bundles used by third-year students and published writers, than in the structural types of target lexical bundles used by first-year students and published writers.

As in the case of HLB2b (§3.6.6), the lexical bundles in each corpus were identified by means of the WST program, and the percentages of the four main structural types (verb-based, noun-based, preposition-based and ‘other’) calculated. The distribution of structural types was then measured in terms of the percentage of occurrence in each corpus, that is, first-year essays, third-year essays and published articles. The final step in this analysis was for the target bundles in each student corpus to be compared to the published corpus to establish whether there is a greater difference between the first-year and published corpora than between the third-year and published corpora. A summary of the data and statistical procedures applied in HLB3b is presented below:

Data analysis	Statistical procedure
Proportions of structural types in 1 st year, 3 rd year and published corpora	Chi-square (plus Standardised Residuals): Distribution of four structural types in 1 st year vs 3 rd year vs published corpora

Table 3.22: Overview of the analyses conducted for Hypothesis LB3b

The comparative analysis of structural types of lexical bundles within first-year, third-year and published writing was succeeded by the analysis of functional types in these corpora. The aim in this case was to establish whether the use of functional types by third-year students was closer to that of published writers than was the use of these types by first-year students.

HLB3c Lexical bundles (functions) and year hypothesis:

There are fewer differences in the functional types of target lexical bundles used by third-year students and published writers, than in the functional types of target lexical bundles used by first-year students and published writers.

As in HLB2c (§3.6.6), the WST program was used to identify lexical bundles in the first-year and third-year essay corpora, as well as in the corpus of published writing. These bundles were then identified in terms of the three main functional types: research-oriented, text-oriented and participant-oriented. The percentage of these types within each of the corpora was calculated, and these percentages compared by means of the Chi-square test (plus Standardised Residuals). A summary of the data and statistical procedures applied in HLB3c is presented below:

Data analysis	Statistical procedure
Proportions of functional types in 1 st year, 3 rd year and published corpora	Chi-square (plus Standardised Residuals): Distribution of three functional types in 1 st year vs 3 rd year vs published corpora

Table 3.23: Overview of the analyses conducted for Hypothesis LB3c

The primary distinction between HLB2 and HLB3, then, is the focus on L1 and AL speakers in the first set of hypotheses, as opposed to first-year and third-year students in second. In both cases, however, the operational hypotheses express similar expectations, that the first-

language students' and third-year students' use of lexical bundles should correspond more closely to that of published writers than does that of additional language and first-year students.

The focus now shifts from a comparison of student and published corpora to a comparison between the use of the target bundles by students in academic writing and in the IELTS writing test answers.

3.6.8 Lexical bundles and IELTS (HLB4)

HLB4 (Lexical bundles and IELTS hypothesis)

Students' use of lexical bundles in their essays will approximate their use of lexical bundles in the writing component of the IELTS test.

As in the case of HV4, the last of the lexical bundle hypotheses is based on the assumption that, since the IELTS test is used as a measure of academic performance, the written component of this test and student academic writing may be expected to share similar lexical features. Three operational hypotheses were developed to test this assumption by examining differences in density, structural types and functional types. Each of these is considered in turn below.

HLB4a Lexical bundles (density) and IELTS hypothesis:

There is a positive relationship between the density of target lexical bundles used by students in the IELTS writing test and in their essays.

The aim of this hypothesis was to determine the degree of difference between the occurrence of lexical bundles in the IELTS writing tests and in academic essays. In line with previous hypotheses relating to density of bundle use, density was measured in terms of the number of target bundles in each corpus, calculated as a percentage of the total number of words in the text. The texts to be compared within each corpus were from those participants who submitted both the IELTS Task 2 writing test and the minimum number of essays required for inclusion in the study ($n = 148$) (§3.5.1; Table 3.4). The log-likelihood technique was then used to test for significance in the differences in the densities of lexical bundles between the two corpora.

A summary of the data and statistical procedures applied in HLB4a is presented below:

Data analysis	Statistical procedure
Target bundles <ul style="list-style-type: none"> ➤ top 118 in published corpus ▶ Number of target bundles in 1st year corpus; total number of words in the student corpus ▶ Number of target bundles in 3rd year corpus; total number of words in the student corpus ▶ Number of target bundles in published corpus; total number of words in the published corpus 	Log-likelihood test for significant differences between: <ul style="list-style-type: none"> ▶ 1st years: number of target bundles x 4 / total number of words in the student corpus ▶ 3rd years: number of target bundles x 4 / total number of words in the student corpus ▶ Published: number of target bundles x 4 / total number of words in the published corpus ➤ 1 st years vs 3 rd years vs published

Table 3.24: Overview of the analyses to be conducted for Hypothesis LB4a

Having considered the density of occurrence of lexical bundles, the next operational hypothesis examined the distribution of structural types in both corpora with the aim of establishing whether there was a significant difference between the range of structural types of bundles used in the IELTS writing tests and in the student essays.

HLB4b Lexical bundles (structures) and IELTS hypothesis:

There is a positive relationship between the distribution of structural types of target lexical bundles in the IELTS writing test and in the students' essays.

As in the case of HLB2b (§3.6.6) and HLB3b (§3.6.7), distribution refers to the number of each sub-category to occur within the range of structural types, with the four main types assessed again being verb-based, noun-based, preposition-based and 'other' (§3.5.2.3b). The percentages of structural types in each of the two corpora were compared by means of the Chi-square test in order to measure degree of difference. A summary of the data and statistical procedures applied in HLB4b is presented below:

Data analysis	Statistical procedure
Proportions of structural types in 1 st year, 3 rd year and IELTS corpora	Chi-square (plus Standardised Residuals): Distribution of four structural types in 1 st year vs 3 rd year vs IELTS corpora

Table 3.25: Overview of the analyses conducted for Hypothesis LB4b

As in HLB2 and HLB3 (§3.6.6 and §3.6.7), the analysis of structural types and functional types in HLB4 was conducted by means of the investigation of two separate operational hypotheses. While the focus of HLB4b was on differences between structural types, the aim of HLB4c was to explore possible differences in functional types used within the IELTS writing test answers and the student essays.

HLB4c Lexical bundles (functions) and IELTS hypothesis:

There is a positive relationship between the distribution of functional types of target lexical bundles in the IELTS writing test and in the students' essays.

In line with previous analyses (§3.6.6 and §3.6.7), the three main functional type categories analysed were research-oriented, text-oriented, and participant-oriented (§3.5.2.3b). The percentage of types from each subcategory was calculated for IELTS writing and essay writing, and the percentages compared using the Chi-square procedure to establish possible differences in use of functional types between the two corpora. A summary of the data and statistical procedures applied in HLB4c is presented below:

Data analysis	Statistical procedure
Proportions of functional types in 1 st year, 3 rd year and IELTS corpora	Chi-square (plus Standardised Residuals): Distribution of three functional types in 1 st year vs 3 rd year vs IELTS corpora

Table 3.26: Overview of the analyses conducted for Hypothesis LB4c

Comparing the density and types of lexical bundles that occur in both the IELTS Task 2 writing test and academic essays serves to shed light on the issue of whether this IELTS writing test is an appropriate task as a measure of the style of writing required within the university context, and to what degree the test scores allocated to this task may be expected to correlate with academic performance.

In contrast to the previous hypotheses which consider aspects of the use of academic vocabulary and lexical bundles both in student essays and in the IELTS writing test in relation to published writing, the aim of the next set of hypotheses was to focus on the extent to which the IELTS Task 2 writing test provides an indication of students' academic performance.

3.6.9 IELTS and performance (HIE1)

HIE1 (IELTS and performance hypothesis)

Students who perform well in the IELTS test are more likely to perform well academically.

As the IELTS test is currently used by Wits University as one of the criteria in terms of which non-English speaking international students are granted access to the University (§2.4), this section of the study investigated the degree to which components of the IELTS test, namely Task 2 of the writing test as well as the reading test, serve to predict academic performance. This was first assessed indirectly by considering possible differences between particular lexical features in the IELTS writing test and in academic essays (HV4 and HLB4), and then directly in the two operational hypotheses discussed below (HIE1a and HIE1b) by examining the relationship between IELTS scores and academic performance by those first-year and third-year students who had completed both IELTS writing and reading tests ($n = 151^{24}$). The justification for focusing on the first and third years of academic study, without taking the second year into account, is again based on the critical nature of first-year in relation to throughput, and the importance of the third-year result as a measure of overall academic performance in the undergraduate degree (§3.6.4). The first of these operational hypotheses considers the IELTS writing test scores, while the second examines the reading test scores.

HIE1a IELTS writing and performance hypothesis:

There is a positive relationship between students' IELTS writing scores and academic performance, as measured by their essay results.

The degree of validity of this hypothesis was assessed by means of a comparison between the IELTS Task 2 writing test scores and students' essay results. The academic results for the students were classified per year of study, and were then compared to their IELTS writing scores using Pearson correlation tests to establish degree of difference. A summary of the data and statistical procedures applied in HIE1a is presented below:

²⁴ It must be noted that the discrepancy in participant numbers between HV4, HLB4 and HIE is due to the loss of two of the IELTS writing tests. While marks had been recorded for these tests, it was not possible to analyse type/token percentages as the written tests were not included in the IELTS corpus.

Data analysis	Statistical procedure
IELTS writing results as a percentage Essay averages for PSY100 and PSY300	Pearson (r): IELTS writing results – essay results for PSY100 IELTS writing results – essay results for PSY300

Table 3.27: Overview of the analyses conducted for Hypothesis IE1a

The analysis conducted for HIE1b was similar to that for HIE1a in that IELTS test scores were compared to academic results. However, the aim of this operational hypothesis was to determine the relationship between IELTS reading test scores and academic performance.

HIE1b IELTS reading and performance hypothesis:

There is a positive relationship between students' IELTS reading scores and their academic performance, as measured by their essay results.

The validity of this hypothesis was assessed by means of a comparison between the IELTS reading test scores and students' essay results. As in HIE1a, the academic results for the students divided by year of study was then compared to their IELTS reading scores using the Pearson product-moment correlation. A summary of the data and statistical procedures applied in HIE1b is presented below:

Data analysis	Statistical procedure
IELTS reading results as a percentage Essay averages for PSY100 and PSY300	Pearson (r): IELTS reading results – essay results for PSY100 IELTS reading results – essay results for PSY300

Table 3.28: Overview of the analyses conducted for Hypothesis IE1b

This section has described in detail the data, processes and statistical measures used in the investigation of the nine main hypotheses on which this study is based. Each of these is operationalised in terms of a number of specific hypotheses which serve to break down the main hypotheses into aspects that can be tested, and so supported or refuted. The results of the analysis conducted for each hypothesis are presented in Chapter 4, with discussion of these findings in Chapter 5.

3.7 Conclusion

The aim of my research is to contribute to the field of linguistics by addressing questions such as how to assess students' academic potential at the start of their university careers in order to identify those in need of academic support; what the differences are in the use of academic vocabulary and lexical bundles by undergraduate students from different language backgrounds in contrast with that by field experts; what degree of development is reflected in the varied uses of lexical features by first-year as opposed to third-year students; and how these differences can be addressed in order to improve students' use of the academic register required by their field of study.

This chapter has presented the research questions that form the framework in terms of which the aims and hypotheses of this study were structured. Aspects of the design were described, with reference to insights gleaned from the pilot study, particularly where these influenced the design of the main study, for example, the identification of first and additional language speakers to assess differences in the lexical features used by these groups.

A profile was provided of those students who participated in this study, with a description of the setting in which the research was conducted. The corpora that formed the primary data sources for this study were described, with an explanation of the methods used to develop each of the corpora and to analyse both academic vocabulary and lexical bundles. The types of vocabulary tests aimed at assessing receptive and productive aspects of vocabulary were presented, while aspects of lexical bundles examined in the course of the study, such as structural and functional types, were described and illustrated,

The purpose of the interviews conducted with volunteers from the student group was explained, with a description of the questions asked and the tests designed to assess understanding of lexical bundles. The last aspect of the research design to be discussed was that of the IELTS tests, where the procedure followed in the course of implementing both reading and writing components of the IELTS test was described.

The final section of this chapter presented a detailed account of the 17 operational hypotheses tested in the course of this study, providing the formulation of each hypothesis with the aims and the procedure followed in the course of assessing the validity of that hypothesis. The results for each of these operational hypotheses is presented in the next chapter, with a discussion of the findings.

Chapter 4

Findings²⁵

4.1 Introduction

The aim of this chapter is to present and discuss the findings of the study, first contextualising them in terms of the research approach and methods used.

The discussion regarding research design (§3.3) distinguished between quantitative and qualitative research methods, outlined the advantages of the ‘mixed methods’ approach, and indicated how the combination of approaches applies to this study. In the course of this introduction, the type of research approach used will be explicitly linked to each method of data collection.

It should be borne in mind that this study investigates three aspects of student writing: academic vocabulary, lexical bundles, and lexical features of the IELTS proficiency test answers. In order to measure academic vocabulary, a predominantly quantitative approach was used: two vocabulary tests were conducted, one receptive and the other productive, and the results compared to the students’ essay results. In addition, both student and published writers’ use of academic vocabulary in texts was measured by means of Cobb’s (2004) Vocabprofile program. The Vocabprofile results for the entire cohort of students, from their first year to their third year, were then also compared to their essay results. The next step in the analysis of academic vocabulary was to compare these results for different categories of students (first-language speakers and additional language speakers, as well as first years and third years) against the corresponding results for the published writers, focusing particularly on the density of occurrence of these lexical items. The final step in the quantitative analysis of academic vocabulary was a comparison of the density of these items in the students’ essays and in the IELTS writing tests, again by means of the Vocabprofile program. One of the more qualitative analyses conducted involved an assessment of keyness with the aim of identifying academic items used considerably more frequently by particular student groups: additional language in contrast with first-language speakers, and the high academic achievers in contrast to the low achievers across all three years of undergraduate study. The aim of this qualitative

²⁵ I acknowledge that, as a result of the scope of this study, this chapter is extensive. However, I decided to present the findings in a single chapter rather than creating three separate chapters so as to enhance overall coherence and help contain the length of the thesis as a whole.

analysis was therefore to identify instances of overuse, underuse and idiosyncratic uses of academic vocabulary in the student corpora.

The second aspect of this study, that of students' use of lexical bundles, involved a quantitative examination of the relationship between the density of lexical bundles within students' essays and their essay results as an indication of academic performance. As with academic vocabulary, the density of lexical bundle use was considered in terms of students grouped according to academic level and language background. Again, the results of the measures of lexical bundle density in student writing were compared to those in published writing. However, in the analysis of bundles, these were further categorised according to structural and functional features, and the use of both structures and functions by the various student groups contrasted with their use by published writers.

The investigation of the occurrence of lexical bundles in student essays and IELTS writing tests formed the last step in the analysis of bundles. As with the academic vocabulary, a qualitative investigation was conducted with the aim of exploring the students' appropriateness of lexical bundle use. This was done through a study of keyness, comparing the high and low achievers across the first year, second year and third year in order to assess differences in use. Concordance lines in which key lexical bundles occurred were compared to determine instances of idiosyncratic use by students (§3.5.2.3a). Finally, the lexical bundles used by those students who volunteered to be interviewed were considered in relation to their essay results as well as their results for the academic vocabulary and lexical bundle test conducted during the interviews (§3.5.2.4 and Appendix O). The perspectives which these interviewees provided on the problems they had experienced with writing and other aspects of their studies are discussed in relation to both quantitative and qualitative results in order to shed light on any findings that may appear contradictory or difficult to account for.

While the quantitative investigations in this study involve discrete-item tests and statistical analyses, the qualitative investigations involve 'manual' inspection of concordance lines and the related context where required, the interpretation of collocational information, the identification of idiosyncrasies, the classification of errors and explanations of overuse and underuse. In the context of the quantitative framework the term 'use' refers to density of occurrence as measured by Vocabprofile and Wordsmith Tools (WST). Within the qualitative framework this term refers to overuse, underuse and idiosyncratic use, whether grammatical, semantic or collocational (§3.3, §3.5.2.3 and §4.2.5.1).

The third aspect of this study was the IELTS test as a predictor of academic performance. In addition to considering the degree to which the students' use of academic vocabulary and lexical bundles in the IELTS writing test corresponded to their use of these lexical features in academic essays, reading and writing scores from the IELTS test were compared to the students' essay results to determine the degree of correlation.

The quantitative aspect of this study is essentially corpus-driven, in that the identification of target bundles was based on frequencies and statistical distribution while the identification of academic vocabulary was based on the Academic Word List (Coxhead, 2000) and so pre-defined. The primary method of research which applies in the case of both the quantitative analyses and the keyness studies is an inductive approach (§2.3.2). Dörnyei (2007:37) refers to this as an “emergent research design ... [in which] the analytic categories/concepts are defined during, rather than prior to, the process of the research”. In other words, the approach does not focus on a particular linguistic area but seeks to explain why differences occur through a ‘bottom-up’ discovery procedure.

The next three main sections of this chapter present and discuss the results with regard to each of the three aspects of student writing researched.

4.2 Vocabulary

This section deals with the hypotheses relating to both receptive and productive vocabulary across the 5000-word and 10 000-word frequency levels as well as from the range of academic vocabulary items (§3.5.2.3a). It contains four main hypotheses which give rise to five operational hypotheses.

4.2.1 Vocabulary and performance (HV1)

HV1 (Vocabulary and performance hypothesis)

Students who perform well on measures of vocabulary proficiency are more likely to perform well academically.

The first hypothesis relates to measures of vocabulary proficiency, focussing on high level, low frequency vocabulary as well as on academic vocabulary. The two operational hypotheses in terms of which this issue is explored are discussed below (§4.2.1.1 and §4.2.1.2).

4.2.1.1 Vocabulary (essay) and performance (HV1a)

HV1a Vocabulary (essay) and performance hypothesis:

There is a positive relationship between students' use of academic vocabulary in their essays and their academic performance, as measured by their essay results.

In order to test this assumption, the number of academic words in each student's essay was calculated as a percentage using Cobb's (2004) Vocabprofile program, and compared with the student's result for that essay, using the Pearson correlation coefficient as the statistical measure. As discussed in Chapter 3 (§3.6.1), the students' use of academic vocabulary was therefore operationalised in terms of density of occurrence. This procedure was conducted for each of the essays collected over the three years of the longitudinal study: three for PSY100, four for PSY200 and 12 (four per student from the 12 topics available) for PSY300. The results of the analysis conducted to determine the relationship between the tokens of academic vocabulary (measured as a percentage) derived from Coxhead's (2000) Academic Word List (AWL), and the related essay results are presented in Table 4.1.

Essay	<i>n</i>	Mean	SD	<i>r</i>
PSY100 AWL tokens (May)	147	8.69	1.65	.180*
PSY100 essay 2	147	69.12	9.27	
PSY100 AWL tokens (Aug)	157	10.35	1.89	.235**
PSY100 essay 3	157	67.94	10.89	
PSY100 AWL tokens (Sep)	159	13.24	2.15	.214**
PSY100 essay 4	159	69.99	8.35	
PSY200 AWL tokens (Mar)	157	11.31	2.19	.212**
PSY200 essay 1	157	62.28	11.39	
PSY200 AWL tokens (May)	159	8.12	1.52	.178*
PSY200 essay 2	159	68.13	9.71	
PSY200 AWL tokens (Aug)	159	10.85	7.17	.146
PSY200 essay 3	159	74.1	9.95	
PSY200 AWL tokens (Oct)	144	9.87	1.86	.245**
PSY200 essay 4	144	68.81	10.59	
PSY300 AWL tokens (3001)	77	9.57	1.72	.373**
PSY300 – 3001	77	66.38	11.68	
PSY300 AWL tokens (3013)	52	11.87	2.04	.338*
PSY300 – 3013	52	71.22	8.19	
PSY300 AWL tokens (3015)	53	9.70	1.97	.254
PSY300 – 3015	53	71.12	9.58	
PSY300 AWL tokens (3016)	40	11.02	2.45	.393*
PSY300 – 3016	40	65.04	11.16	

Essay	<i>n</i>	Mean	SD	<i>r</i>
PSY300 AWL tokens (3017)	52	11.06	1.66	.236
PSY300 – 3017	52	64.46	9.12	
PSY300 AWL tokens (3018)	38	11.20	2.22	.180
PSY300 – 3018	38	61.81	11.14	
PSY300 AWL tokens (3019)	21	12.98	2.17	.395+
PSY300 – 3019	21	63.56	10.02	
PSY300 AWL tokens (3020)	36	10.38	2.42	.253
PSY300 – 3020	36	73.71	4.20	
PSY300 AWL tokens (3021)	49	11.90	2.05	.215
PSY300 – 3021	49	71.18	8.89	
PSY300 AWL tokens (3022)	44	7.58	1.67	-.038
PSY300 – 3022	44	71.73	6.85	
PSY300 AWL tokens (3023)	47	12.82	2.59	.322*
PSY300 – 3023	47	71.50	6.89	
PSY300 AWL tokens (3034)	75	10.50	2.02	.109
PSY300 – 3034	75	66.79	11.32	

*. Correlation is significant at the 0.05 level. **. Correlation is significant at the 0.01 level.

+. Result is not significant because of the small sample size.

Table 4.1: Correlations between the density of academic words within each essay for PSY100, PSY200 and PSY300, and the results of the essay

The results of the analysis conducted for the vocabulary (essay) and performance hypothesis reflect a significant relationship between the variables of academic vocabulary and academic performance in all first-year essays, and in the majority of second-year essays. This relationship decreases markedly in the third year, however, with only one third of the essays reflecting a relationship between the variables. It was conjectured that this decrease may be accounted for by a difference in the use of academic vocabulary across the three years. In order to investigate this possibility, the sum of the proportional use of academic vocabulary in each essay (indicated as a percentage) was calculated, and this total divided by the number of essays submitted per assignment to determine the average percentage of academic items used. However, this investigation shows that the decrease in correlation between third-year essay results and density of academic vocabulary does not correspond to a drop in the use of academic words, as the overall average percentage of AWL items was 10.76 for the PSY100 essays, 10.04 for PSY200 and 10.88 for PSY300²⁶.

The lack of any real difference in overall averages across the three years shows that the students' use of academic vocabulary is generally consistent, and suggests that other variables

²⁶ The percentage for each essay in PSY100, PSY200 and PSY300 is provided in Appendix P (Table A-4.1).

are more likely to account for the poor correlations between use of academic vocabulary in an essay and the essay result, particularly at third-year level. The aim of the qualitative study following the presentation of quantitative results (§4.2.5) is to explore in more depth aspects of the students' use of academic vocabulary in an attempt to account for the inconsistencies in the results in Table 4.1, and so explain why the correlations for the first years are more significant than for the third year students.

The findings of the Pearson correlation tests conducted to assess HV1a are inconclusive, and therefore do not support the assumption that there is a relationship between students' use of academic vocabulary and their academic performance. This conclusion corresponds with Morris and Cobb's (2004:85) finding that low correlations between vocabulary profiles and academic results precluded the Vocabprofiler from being used as an independent measure of assessment, with the result that "vocabulary profiles offer good potential as predictors of academic performance ... if used in conjunction with more traditional forms of entrance assessment" (§2.2.3). Although there is little actual difference in the density of academic vocabulary used by students across the three years of undergraduate study, the trend seems to be for the degree of correlation between density of academic vocabulary and essay results to diminish from first year to third year. This suggests that the proficient use of academic vocabulary has a greater influence on academic performance in the earlier stages of the undergraduate degree, but that other factors supersede the importance of academic vocabulary as the students progress. This possibility is drawn from Cummins' (1981) threshold hypothesis and the short-circuit hypothesis (Brisbois, 1995 and Clarke, 1980), and is considered in more detail in the discussion following the presentation of results for the vocabulary hypotheses (§4.2.6). Next to be considered is the relationship between vocabulary test results and essay results.

4.2.1.2 Vocabulary (test) and performance (HV1b)

HV1b Vocabulary (test) and performance hypothesis:

There is a positive relationship between students' results on tests of academic and high-level vocabulary and their academic performance, as measured by their essay results.

In order to test this hypothesis, the results of both receptive and productive vocabulary tests for academic vocabulary as well as the 5000-word and 10 000-word frequency levels were compared with the students' essay results using the Pearson correlation coefficient. As discussed in Chapter 3 (§3.5.2.3a), a receptive vocabulary test of the 2000, 3000, 5000 and 10 000 frequency levels as well as academic vocabulary drawn from Coxhead's (2000)

Academic Word List (AWL) was conducted in 2011, at the start of the students' first year (Appendix K). As the students generally performed exceptionally well on the 5000 and AWL sections of the receptive test, obtaining means of 90.75 and 95.44, respectively, a productive vocabulary test was then conducted to determine whether these results would be consistent in both sets of tests, or whether the format of the receptive test, which allows for a certain amount of guessing, may have skewed the test results. As the students had obtained means of 98.3 and 97.3 for the 2000 and 3000 levels tests, respectively, these frequency levels were omitted from the productive vocabulary test following Schmitt et al.'s recommendation that these sections be excluded for more advanced learners (2001:71). The productive test then focused on the mid to lower frequency levels, that is, words from the 5000 and 10 000 levels as well as on items from the AWL, and was conducted at the start of 2012, the students' second year (Appendix L). The results of these tests are illustrated below, with the mean, standard deviation and number of essay/test results for each set of scores given in Table 4.2a, and the correlations listed in Table 4.2b.

	N	Mean	SD
PSY100 essay	160	69.32	7.24
PSY200 essay	160	68.33	6.93
PSY300 essay	160	68.21	7.29
Receptive AWL	98	95.44	6.19
Receptive 5000	98	90.75	13.99
Receptive 10 000	98	65.58	21.90
Productive AWL	120	72.33	13.25
Productive 5000	120	70.29	17.89
Productive 10 000	120	43.50	23.25

Table 4.2a: Means and standard deviations for essay marks and vocabulary test results

It should be noted that there is a decrease in the mean across the three frequency levels of both receptive and productive tests. The productive test means at all three levels were more than 20 percent lower, suggesting that the potential for guessing created by the matching format used in the receptive vocabulary test (§3.5.2.3a) may artificially inflate scores. However, this conclusion is not supported by the correlations in Table 4.2b, which generally reflect a stronger relationship between vocabulary test scores and essay averages for the receptive rather than the productive vocabulary test. It should also be noted in Table 4.2a that students performed least well at the 10 000-word level, which also has the highest standard

deviation, indicating a wide range of results for this set of items, particularly in the productive test.

Vocabulary test	PSY100 (<i>r</i>)	PSY200 (<i>r</i>)	PSY300 (<i>r</i>)
Receptive AWL	.264**	.397**	.316**
Receptive 5000	.169	.268**	.367**
Receptive 10 000	.413**	.468**	.490**
Productive AWL	.221*	.347**	.321**
Productive 5000	.261**	.296**	.258**
Productive 10 000	.318**	.299**	.274**

** . Correlation is significant at the 0.01 level. * . Correlation is significant at the 0.05 level.

Table 4.2b: Results of correlation tests for vocabulary test results and essay marks

Table 4.2: Vocabulary test results and essay marks

It is clear from Table 4.2b that nearly all the correlations are very significant. Only the receptive vocabulary test at the 5000-word level did not reach statistical significance. These findings indicate that, while the test scores for the academic items on the productive vocabulary test have the highest correlation with the PSY200 and PSY300 essay results, the highest correlation overall occurs at the 10 000-word level of the receptive vocabulary test. This applies across all three academic years, demonstrating that the 10 000-word frequency level of the receptive vocabulary test has the strongest relationship with the students' essay results.

The claim made in Hypothesis V1b is therefore partially supported by these findings as the results of the 10 000-word level in the receptive vocabulary test show moderate correlations with the essay results at the $p < .01$ level, while the remaining test scores generally have low correlations.

In an attempt to corroborate these findings, a standard multiple regression was conducted in which all six vocabulary scores were entered into the equation at the same time (§3.6.1). "Multiple regression tells you how much of the variance in your dependent variable can be explained by the independent variable. It also gives you an indication of the relative contribution of each independent variable." (Pallant, 2005:145.) This statistical test was conducted on the 60 participants who had completed both the receptive and productive vocabulary tests. The results provide further evidence to support the correlation results as a significant model emerged (adjusted $R^2 = .278$, $p < .001$), with the 10 000-word level of the receptive test shown to be the strongest predictor of academic performance ($\beta = .525$, $p < .05$), accounting for 28% of the variation. None of the other frequency levels within the vocabulary tests made a

significant contribution to academic performance. While these results are admittedly based on a small sample, and should therefore be treated with caution, this finding contributes to the overall conclusion drawn in the discussion (§4.2.6).

A possible explanation for the lack of significance of the 5000-word level receptive test in relation to the first-year essay results (Table 4.2b) may be found in Cameron’s (2002) study of the vocabulary size in speakers of English as an additional language. Cameron’s analysis of the receptive vocabulary of students for whom English had been the language of instruction for 10 years showed gaps in the most frequent words and “serious problems at the 5K level” (2002:167). Although the overall mean for the receptive 5000-word level vocabulary test (90.75, SD = 13.99) shows little evidence that the participants of this study experience problems with this range of vocabulary items²⁷, the difference in means between the L1 and AL groups indicates that the AL students generally have a weaker grasp of the 5000 frequency level, as illustrated below.

	L1 students			AL students		
	<i>n</i>	Mean	SD	<i>n</i>	Mean	SD
Receptive AWL	32	97.01	4.30	28	93.69	7.33
Receptive 5000	32	95.94	4.54	28	87.86	10.31
Receptive 10 000	32	75.52	15.30	28	52.74	20.67
Productive AWL	32	74.53	11.38	28	63.27	16.76
Productive 5000	32	75.52	12.20	28	56.96	21.64
Productive 10 000	32	53.44	19.10	28	25.47	20.05

Table 4.3: Means and standard deviations for vocabulary test results according to L1 and AL groups

These descriptive results clearly indicate that the first-language speakers performed better on all levels of both the receptive and productive vocabulary tests. Treffers-Daller and Milton (2013:159) report on similar findings as the monolingual English speakers in their study had a larger mean vocabulary than those who spoke English as a foreign language, while Morris and Cobb (2004:83) found that the gap in vocabulary profiles between native speakers and non-native speakers was striking as “NNSs were only half as likely as NSs to have the ideal results [required to meet a modest academic writing standard] across the board”. Santos (2004:8) presents the “not surprising finding” that native English students “exhibit stronger academic vocabulary skills than the language-minority students” in the same class. Scheepers

²⁷ A Pearson correlation test shows no significant relationship between the results of the receptive vocabulary test at the 5000-word level and the first-year essay results, either for L1 students ($r = .246, p = .174, n = 32$) or for AL students ($r = .228, p = .244, n = 28$).

(2014:152) also found that the English-speaking students in her study had “greater vocabulary knowledge than the indigenous language groups”, that is, those who spoke African languages such as isiXhosa, isiZulu, Sepedi, Sesotho and Setswana as their mother tongue, and English as an additional language. One of the questions addressed in the current study is the degree to which the gap typically found between the vocabularies of native and non-native English speakers affects the academic performance of the additional language students in particular.

Although the results of the multiple regression suggest that the 10 000-word level has the greatest impact on academic performance within this study, the importance of the 5000-word level within the academic context must also be taken into account as the interpretation of unknown words is dependent on the reader’s understanding of the context (Gardner, 2007; Hancioğlu et al., 2008; Nagy and Townsend, 2012). For this reason, Hu and Nation (2000:422) argue that “the density of unknown words has a marked effect on text comprehension”, and the minimal threshold for reading comprehension is seen as 5000 word families (Clark and Ishida, 2005; Cooper, 2000b; Laufer, 2010; Nizonkiza and Ngwenya, 2015). Beyond the minimal threshold, Nation (2006) proposes that a vocabulary of 8000 to 9000 word families provides the 98% coverage required for adequate comprehension, while Treffers-Daller and Milton (2013) claim that a vocabulary of approximately 10 000-word families is required at the start of an undergraduate degree. The mean results for both receptive and productive vocabulary tests in Table 4.3 suggest that the L1 students have sufficient academic and 5000-word level vocabulary to enable them to interpret the meaning of unknown words at the 10 000-word level, and so continue developing their low frequency vocabulary through their understanding of the context and of the words in the immediate context. The AL students, on the other hand, appear more likely to struggle with the low frequency and academic vocabulary of academic texts as they have access to a smaller range of vocabulary items. As a result, they are less likely to be able to draw on an understanding of the context to assist with the interpretation of unknown words. For this reason, while both language groups generally have sufficient grasp of the 5000-word level to meet the minimum threshold required for reading, the AL students’ slightly weaker grasp of this frequency level is more likely to impact their academic performance as it directly affects their ability to determine the meaning of words at the 10 000-word level.

The main conclusion to be drawn from the results for HV1b is that, within the context of this study, academic vocabulary contributes less towards variance in academic performance than does the 10 000-word frequency level. While there is no clear pattern as to whether the receptive or productive vocabulary tests have a higher correlation with the essay results at the AWL and 5000-word levels, the correlations at the 10 000-word level showed the strongest

relationship between the receptive vocabulary test results and the essay results across all three years of academic study. This result in conjunction with the results for HV1a (§4.2.1.1), in which significant correlations between students' use of academic words and the essay results taper off considerably from first year to third year, appears to support the argument that vocabulary is just one component of language ability that "must be considered in relation to the number of other variables which contribute to academic performance" (Cooper, 1999:105). Studies that have found the correlation between vocabulary and academic performance to be fairly low include those by Treffers-Daller and Milton (2013), and by Morris and Cobb (2004). In the former study, results reflect "a modest correlation between vocabulary size and academic performance" (Treffers-Daller and Milton, 2013:161), while in the latter, vocabulary profiles provided a weak correlation with academic results. These researchers recommend that vocabulary profiles be run in conjunction with other methods of assessment on the grounds that "none of these correlations is sufficiently high to support an argument in favour of vocabulary profiles as a stand-alone instrument" (Morris and Cobb, 2004:82). The implications of these findings for students of varying educational backgrounds are considered in the discussion that follows the presentation of the vocabulary hypotheses results (§4.2.6).

The hypothesis to be explored in the next section relates to the assumption that first-language speakers are likely to have a greater degree of academic vocabulary proficiency than are additional language speakers.

4.2.2 Vocabulary and language (HV2)

HV2 (Vocabulary and language hypothesis)

First language students' use of academic vocabulary will approximate that of published writers more closely than will that of additional language students.

Following from research results which support the assumption that L1 speakers have a larger general vocabulary than L2 speakers (Morris and Cobb, 2004; Treffers-Daller and Milton, 2013; Santos, 2004; Scheepers, 2014), this hypothesis aims to investigate the degree of difference between the academic vocabularies of L1 and AL speakers in relation to published writers. The operationalisation of the term 'use' in the context of this hypothesis, as well as the justification for comparing native and non-native corpora with the published corpus as a benchmark, are provided in Chapter 3 (§3.6.2).

4.2.2.1 Vocabulary (density) and language (HV2a)

HV2a Vocabulary (density) and language hypothesis:

There is less difference between the density of occurrence of academic vocabulary used by first language (L1) students and published writers, than between the density of occurrence of academic vocabulary used by additional language (AL) students and published writers.

As the tests for this hypothesis require English first language students to be distinguished from students for whom English is not a first language, the descriptive statistics for the students were examined to determine the proportion of each group of participants. Of the 160 participants in the study, 96 (60%) spoke English as a first language, while 62 participants (38.8%) spoke English as a second language (§3.5.1). Only two of the participants (1.2%) spoke English as a third or fourth language, a statistically negligible sample. For this reason, first-language speakers of English are regarded as one group (L1), while second-, third- and fourth-language speakers of English are regarded as another group, and referred to as additional language (AL) speakers.

In the case of this hypothesis, the assumption is that there is less difference in the density of academic vocabulary used by L1 students when compared to published writers, than by AL students in comparison to published writers. The basis of this assumption is that first-language speakers should have a better grasp of the language, including a more extensive vocabulary and, by extension, a greater awareness of semantic networks (§4.2.1.2). The academic words were counted by means of Cobb's VocabProfile program (2002), and were measured as a percentage of items from the Academic Word List (AWL) (2000). The first step in testing this hypothesis was to conduct an independent samples t-test on the grounds that the L1 and AL students form two separate groups that can be directly compared. Dörnyei (2007:215) supports this approach in stating that "*independent-samples t-tests* are for research designs where we are comparing the results of groups that are independent of each other", while Field (2005:734) explains that this test is used to establish "whether two means collected from independent samples differ significantly". The aim of this test was to compare the density of academic items used by L1 students in their essays over the course of their undergraduate studies with the density of academic items used by AL students over the same period. These results, presented in Table 4.4a, were then compared to the findings from the published corpus.

Language group	<i>n</i>	Mean	SD
L1 speakers	96	10.61	1.44
AL speakers	64	9.88	1.37

Table 4.4a: Descriptive statistics for the density of academic vocabulary used by L1 and AL students

These results show that the first-language speakers use a higher percentage of academic items overall than do the additional language students. The results of the independent samples t-test designed to assess the degree of significance in the difference between the means are provided in Table 4.4b below.

	Levene's Test for Equality of Variances ²⁸		t-test for Equality of Means					
	F	Sig.	t	df	Sig. ²⁹ (2-tailed)	Mean difference	95% Confidence interval of the difference	
							Lower	Upper
AWL averages - Equal variances assumed	.014	.905	3.197	158	.002	.728	.278	1.178

Table 4.4b: Results of the independent samples t-test for density of academic vocabulary use by L1 and AL students

Table 4.4: Results of the tests for density of academic vocabulary use by L1 and AL students

As Levene's test is non-significant ($p > .05$), it can be assumed that the difference between the variances in both cases (that is, the L1 and AL groups) are roughly equal, or, in other words, that the requirement of homogeneity of variances has been met (Field, 2005:301). The results of the t-test indicate that there is a significant difference between the L1 and AL groups in their use of academic items ($t(158) = 3.197, p < .01$), with the L1 students having used a greater proportion of academic words in relation to other frequency levels than the AL students.

²⁸ According to Field (2005:736) Levene's test "tests the hypothesis that the variances in different groups are equal (i.e. difference between the variances is zero). A significant result indicates that the variances are significantly different – therefore, the assumption of *homogeneity of variances* has been violated." Homogeneity of variance relates to the assumption that "the variance of one variable is stable (i.e. relatively similar) at all levels of another variable". (Field, 2005:733)

²⁹ Although all the hypotheses tested in this study are directional, and so would normally require a one-tailed test, I have taken a more conservative approach on the basis of the large numbers being investigated and used two-tailed tests throughout. It is not necessary to conduct a one-tailed test if the results of a two-tailed test are significant as "one-tailed significance is easier to achieve" (Dörnyei, 2007:211), with the result that the chances of a higher correlation improve with a one-tailed test.

If one considers the difference in the use of academic vocabulary between the L1 and AL groups in the PSY100, PSY200 and PSY300 cohorts, the degree of significance in the finding varies for each cohort, as illustrated in Table 4.5.

Academic year	Language group	<i>n</i>	Mean	SD	<i>t</i>	df	Sig.
PSY100	L1 students	96	10.68	1.70	1.023	158	.308
	AL students	64	10.41	1.58			
PSY200	L1 students	96	10.17	2.42	3.328	158	.001
	AL students	64	9.01	1.70			
PSY300	L1 students	96	10.97	1.63	2.856	158	.005
	AL students	64	10.22	1.63			

Table 4.5: Results of the independent samples t-test for density of academic vocabulary use by L1 and AL students within first year, second year and third year³⁰

While the difference in the use of academic tokens is not significant in PSY100, it is very significant in both PSY200 and PSY300. These results indicate that the L1 students used considerably more academic vocabulary items in their essays in both the second year and the third year than did the AL students. These findings link back to the results of the receptive and productive vocabulary tests which showed that the L1 students understood and had access to a greater range of academic words (§4.2.1.2, Table 4.3).

In order to determine the proportion of academic vocabulary used by L1 and AL students in their essays relative to the proportion of academic vocabulary in the journal articles within the published corpus, a one-sample t-test was conducted. In this t-test, the mean for a set of scores (one sample) is compared to a known or defined population mean with the aim of determining the degree to which the test sample is similar to the known sample³¹. In this case, the mean percentage of academic tokens used by each language group is compared with the mean of the published corpus which serves as a reference value against which the students' use can be measured. Two one-sample t-tests were conducted, one for the L1 group, and one for the AL group, with the mean of the published corpus ($M = 13.26$, $SD = 2.59$) serving as the test value in each case. The mean for each group (L1 and AL students) could then be indirectly compared against that of the published corpus. Table 4.6 below illustrates the results of the one-sample t-test for the L1 and AL students, respectively.

³⁰ Table 4.6 presents an abridged set of results that focus only on the key elements reported in the discussion. The complete set of results for these t-tests is provided in Table A-4.2 in Appendix Q.

³¹ <http://www.psychology.emory.edu/clinical/blwise/Tutorials/TOM/meanstests/tone.htm>

Language group	<i>n</i>	Mean	SD	<i>t</i>	df	Sig.
L1 students	96	10.61	1.44	-18.076	95	.000
AL students	64	9.88	1.37	-19.697	63	.000

Table 4.6: Results of the one-sample t-test comparing density of academic vocabulary use by L1 and AL students to density of use by published writers

The results in Table 4.6 show that the L1 students' use of academic items differs significantly from that of the published writers ($t(95) = -18.08, p < .001^{32}$). These results also indicate a significant difference in the AL students' use of academic items with reference to the use of these items by published writers ($t(63) = -19.70, p < .001$). It is clear from these results that, while the use of academic items by both L1 and AL students is significantly different from that of published writers, the t-value difference is greater for AL students than for L1 students. This difference allows for the conclusion that L1 students' use of academic vocabulary is marginally closer to that of the published writers than is that of AL students, particularly in the case of the second- and third-years who differ significantly in the expected direction (Table 4.5). However, this difference is not sufficient to provide support for the vocabulary and language hypothesis. It is, nevertheless, of considerable interest to note that, if the means are ranked in order of density, the published corpus contains the highest occurrence of academic vocabulary items ($M = 13.26$), with the L1 students ranked second ($M = 10.61$) and the AL students ranked third ($M = 9.88$). It is worth noting that this pattern meets the expectations which underlie the assumption made in HV2, and so serve to support the hypothesis to some degree.

The next hypothesis to be considered relates to the use of academic vocabulary by first-year as opposed to third-year students in relation to the use of this vocabulary by published writers.

4.2.3 Vocabulary and academic year (HV3)

HV3 (Vocabulary and academic year hypothesis)

Third-year students' use of academic vocabulary will approximate that of published writers more closely than will that of first-year students.

As in the case of Hypothesis V2, the operationalisation takes the form of a single working hypothesis, with 'use' again measured in terms of density of occurrence.

³² As the SPSS statistics program (2013) does not go beyond $p < .000$, it is not possible to deduce a significance greater than $p < .001$.

4.2.3.1 Vocabulary (density) and academic year (HV3a)

HV3a Vocabulary (density) and academic year hypothesis

There is less difference between the density of occurrence of academic vocabulary used by third-year students and published writers, than between the density of occurrence of academic vocabulary used by first-year students and published writers.

This hypothesis is based on the assumption that third-year students' use of academic vocabulary will more closely resemble that of published writers than will first-year students' use of this vocabulary. The expectation is that students' vocabularies expand during the course of their undergraduate studies as they encounter, and so learn by means of exposure, academic and high-frequency words as well as technical terms through reading and spoken interaction in the academic context (§2.2.4). It is therefore assumed that third-year students would have a larger vocabulary than first-year students, and would have developed their academic vocabulary in particular so that it corresponds more closely to the academic vocabulary used by published writers.

In order to test this hypothesis, a paired-sample t-test was conducted as this is the appropriate statistical measure when comparing "two sets of scores obtained from the same group ... or when the same participants are measured more than once" (Dörnyei, 2007:215). As this is a longitudinal study in which the same group of 160 students was observed over a period of three years, the first set of scores were obtained from the cohort in their first year of psychology, while the second set were obtained in their third year of study³³. As with Hypothesis V2a, the scores represent the density of academic vocabulary items in the essays submitted over the course of that academic year. The results of the paired-sample t-test are provided in Table 4.7.

Academic year	N	Mean	SD	t	df	Sig.
PSY100 students	160	10.58	1.65	-.667	159	.506
PSY300 students	160	10.67	1.67			

Table 4.7: Results of the paired-sample t-test comparing the density of academic vocabulary use by PSY100 and PSY300 students

³³ It should be noted here that the students who had met all the requirements for inclusion in the study were identified in their third year, and then traced back through the second and first year cohorts to develop the student corpus and related data-base of results and demographic information (§3.5.1).

It is clear from these results that there is very little difference in the density of academic words used by the first-year students and by the third-year students as the *t*-statistic is not significant.

The next step in this comparison was to conduct one-sample *t*-tests on the density of academic items used by first-year and third-year students, with the published writers' mean density again serving as the reference value (*M* = 13.26), as in Hypothesis V2a. The results of the one-sample *t*-tests are provided in Table 4.8 below.

Academic year	<i>N</i>	Mean	SD	<i>t</i>	df	Sig.
PSY100 students	160	10.58	1.65	-20.540	159	.000
PSY300 students	160	10.67	1.67	-19.642	159	.000

Table 4.8: Results of the one-sample *t*-test comparing the density of academic vocabulary use by PSY100 and PSY300 students to that of published writers

These results illustrate that, while the use of academic items by both first-year and third-year students is significantly different from that of published writers, the *t*-value difference is slightly greater for first years than for third years. However, this difference is negligible, as indicated in Table 4.7. The hypothesis that third-year students' use of academic vocabulary will be closer to that of published writers than will the academic vocabulary used by first-year students is therefore not supported.

The main conclusion to be drawn from the findings of both HV2a and HV3a is that published writers use more academic vocabulary than students in general, whether the students are grouped by language background or by academic level. While I am not aware of any other study that has directly compared the density of academic vocabulary in journal articles to that of student writing, a number of studies have found that students' vocabulary across a range of frequency levels does not meet the requirements for academic study (Cameron, 2002; Clarke and Ishida, 2005; Cooper, 1999; Scheepers, 2014). However, given the apparent directional relationship between density of academic vocabulary use and academic performance, and taking into account the students' academic results, it would seem that the students in this study have used sufficient academic vocabulary to meet the requirements of the academic essay genre (§4.2.1.1). In other words, although the students did not use similar proportions of academic vocabulary in their essays to the published writers, they nevertheless performed fairly well overall. It may be argued, therefore, that in the case of students who are not at risk, there is a comparatively weak correlation between academic vocabulary and academic performance. This is considered in more detail in the course of the discussion (§4.2.6).

The last of the predictions regarding academic vocabulary relates to the use of this vocabulary by students in their essays and in the IELTS writing test.

4.2.4 Vocabulary and IELTS (HV4)

HV4 (Vocabulary and IELTS hypothesis)

Students' use of academic vocabulary in their essays will approximate their use of academic vocabulary in the writing component of the IELTS test.

This hypothesis assumes that, if the IELTS test is a predictor of academic performance, the writing component may be expected to provide an indication of students' writing ability within the academic context (§2.4). There should therefore be a degree of correspondence between the academic vocabulary used in the IELTS writing test and the academic vocabulary that typically occurs in undergraduate essays. This would then serve as a realistic measure of the language expected from students, and their ability to use various aspects of this language appropriately in context, including the vocabulary.

As in the case of the previous two hypotheses, this statement is operationalised by means of a single working hypothesis, with 'use' again defined in terms of density of occurrence.

4.2.4.1 Vocabulary (density) and IELTS (HV4a)

HV4a Vocabulary (density) and IELTS hypothesis:

There is a positive relationship between the density of academic vocabulary used by students in the IELTS writing tests and in their essays.

The IELTS Task 2 writing test, as described in Chapters 2 and 3 (§2.4 and §3.5.2.5), is key to this hypothesis. It typically requires candidates for the IELTS proficiency examination to write an opinion-based essay that does not require the use of references. In order to test this hypothesis, the percentage of academic words, measured in terms of AWL tokens, used in each student's PSY100 and PSY300 essays were compared to the percentage of academic words used by each in the IELTS writing tests. This comparison was conducted by means of the Pearson correlation coefficient.

The focus of this analysis was the first-year and third-year essays, with the second-year essays excluded on the grounds that any differences in the density of academic vocabulary use are more likely to manifest themselves when comparing first-year and third-year students, with little

evidence of difference expected between first years and second years, or between second years and third years. This expectation is based on the nature of the improvement generally made by students in the course of their undergraduate studies, which is assumed to be fairly gradual. In addition, given that the IELTS tests are intended to serve as a predictor of academic performance at the end of the third year, when the students complete their undergraduate degree, it may be supposed that they reflect a relationship with the academic writing at third-year level. The results of the Pearson correlation coefficient tests designed to measure the relationship between the density of academic vocabulary in the PSY100 and PSY300 essays, and in the IELTS Task 2 writing tests are reflected in Tables 4.9a and 4.9b below. Only those participants who completed the IELTS writing test as well as submitting the minimum number of first- and third-year essays were included in this count (§3.5.1).

	<i>n</i>	Mean	SD
IELTS academic words	148	5.18	2.33
PSY100 academic words	148	10.56	1.65
PSY300 academic words	148	10.65	1.66

Table 4.9a: Descriptive statistics for the density of academic vocabulary in the IELTS writing tests and in PSY100 and PSY300 essays

It is clear from the mean result for each group that the density of academic words used in both the PSY100 and PSY300 essays is more than twice that of the density used in the IELTS writing tests. The correlations are presented in Table 4.9b.

Density of academic vocabulary	PSY100 AWL tokens (<i>r</i>)	PSY300 AWL tokens (<i>r</i>)	IELTS AWL tokens (<i>r</i>)
PSY100 AWL tokens (<i>r</i>)		.496**	.320**
PSY300 AWL tokens (<i>r</i>)	.496**		.384**
IELTS AWL tokens (<i>r</i>)	.320**	.384**	

** . Correlation is significant at the 0.01 level

Table 4.9b: Results of the correlation analysis for the density of academic (AWL) tokens in PSY100, PSY300 and IELTS corpora

Table 4.9: Results of the analysis for the density of academic (AWL) tokens in PSY100, PSY300 and IELTS corpora

The primary finding on the basis of these correlations is that, despite the differences in mean and the high standard deviation for the IELTS results, the students who use more academic words in IELTS will tend to do the same in their essays. This evidence of a positive relationship between the density of academic words in the essays and the IELTS test therefore supports the hypothesis as the use of academic vocabulary in these two genres is directly proportional.

A secondary finding is that both first-year and third-year students used considerably more academic vocabulary in their essays than in the IELTS test. This raises the question of what type of vocabulary is used in the IELTS corpus to account for this discrepancy. Further investigation into the nature of the general vocabulary used in the student essays and the IELTS test reflects extensive differences between these genres. A keyness analysis (§3.5.2.3) of the IELTS corpus, with the student essay corpus as the reference corpus, shows that the vocabulary in the IELTS texts is more typically representative of spoken discourse. For example, personal pronouns such as *I, you, my* and *we* occur far more frequently in the IELTS corpus, indicating that the student is engaging the reader more directly (Hyland, 1999). Another key feature is the use of auxiliary and main verbs which express personal opinion, such as *should, agree, believe* and *deserve*. This may be accounted for in terms of the nature of the essay topic which requires the students to argue for or against a position on the basis of their personal opinions (§3.5.2.5). In support of this argument, Van Rooy and Terblanche (2015) found similar linguistic features in their analysis of the Tswana Learner English Corpus (TLEC) which had been developed from argumentative essays written by undergraduate students majoring in English. “The topics for the essays are very general in nature, dealing with topical issues in society, such as AIDS, professional sport, the death penalty, and the value of university education” (Van Rooy and Terblanche, 2015:165). The researchers found that the Tswana students used a “less formal, more colloquial style” which included an increase in the use of first and second person pronouns as well as the use of ‘private verbs’³⁴ such as *believe, feel, think* and *understand* (2015:175; 179). I would argue that the similarities in linguistic features found in the TLEC and the IELTS Task 2 writing test corpora are due primarily to the common genre which is elicited by questions requiring students to provide their personal opinion on topics without any reference to external sources, and which distinguishes the IELTS writing test from the academic essay (§4.3.4.3 and §4.4.2).

Related to this expression of opinion is the frequent occurrence of broad, unqualified statements such as *everyone deserves a chance, everyone has the right to* and *I believe all*

³⁴ The term ‘private verbs’ was used by Quirk, Crystal and Leech (1985) to “express intellectual states such as belief and intellectual acts such as discovery. These states and acts are ‘private’ in the sense that they are not observable.” This term was adopted by Biber (1988).

students. Broad generalisations such as these are not typically found in academic essays in which students are encouraged to hedge their arguments (Hyland and Milton, 1997), and are reflected in the use of items such as *everyone*, *all*, *every*, and *everybody*. Further evidence of the occurrence of items more strongly associated with spoken rather than written discourse in the IELTS texts is provided by the high keyness values of *good*, *bad* and *get*. These words tend to denote informal rather than formal, academic register. Finally, the significantly greater use of the infinitive form *to* before verbs such as *be*, *study*, *go*, *get*, *attend*, *have* and *work* in the IELTS corpus signals a far higher proportion of verbs, again more typically characteristic of spoken discourse (Conrad and Biber, 2004:64).

In contrast to the vocabulary in the IELTS texts, the overall vocabulary in the student essays is representative of a nominal style, with significantly more occurrences of the definite article, determiners such as *this*, prepositions and adjectives denoting considerably more use of the noun phrases and prepositional phrases characteristic of academic writing. “The grammatical attributes of academic language – more affixed words, nouns, adjectives, prepositions, and nominalizations – are means of achieving greater informational density and abstractness” (Nagy and Townsend, 2012:93). The frequency of occurrence and related keyness values of these items within the IELTS corpus in relation to the student corpus are shown in Table A-4.3 (Appendix R).

Since the study of concordance lines clearly helps to shed light on questions raised by the quantitative analysis, further in-depth investigations are conducted into differences in the use of academic vocabulary by various groupings of students. These qualitative investigations are discussed in the next section.

4.2.5 Qualitative study of academic vocabulary

The principal assumption underlying the research conducted on vocabulary in this study is that there is a difference in the way in which various groups of students use academic words, particularly in relation to the use of these items by published writers. In addition to a brief investigation into dissimilarities in the use of both academic and general vocabulary by published writers as opposed to students, a more detailed, qualitative analysis of select academic words serves to illustrate how these words are used in context by students of diverse language backgrounds and varying academic levels (§3.3, §3.5.2.3a and §4.1). Although such qualitative analysis can only highlight a few aspects of language use selected from the extensive corpora studied, the aim of this analysis is to demonstrate some of the merits of corpus linguistic investigation at a micro-level.

4.2.5.1 Comparison of academic vocabulary in published and student corpora

As a first step in this qualitative analysis, a measure of keyness was employed to determine which of the academic words in the student corpus differed most significantly from those in the published corpus. As explained in Chapter 3 (§3.5.2.3a), keyness is a measure of saliency rather than frequency as it takes into account which words occur significantly more often in one text than in another (Baker, 2006:125). In the sense that it measures the use of vocabulary in one corpus against the use of that vocabulary in another corpus, keyness represents the degree of overuse and underuse of certain vocabulary items within one corpus in relation to the other. In this case, as the benchmark is the language used by published writers in journal articles, the concepts of ‘overuse’ and ‘underuse’ are defined in terms of what is considered ‘appropriate’ use within an academic context. A feature is regarded as being overused when it is used significantly more relative to the reference corpus, and underused when it has significantly fewer occurrences than in the reference corpus. The interest in the disproportionate use of particular vocabulary items is based on the view that compliance with the accepted norms of academic writing is rewarded. The tendency of non-native language speakers to overuse certain lexical items, referred to by Hasselgren (1994) as “lexical teddy bears”, and underuse others has been reported on by a number of researchers (Ädel and Erman, 2012; Chen and Baker, 2010; De Cock, 2000; Granger and Paquot, 2009; Hasselgren, 1994; and Paquot, 2010). The general conclusion is that “learner usage tends to amplify the high frequencies and diminish the low ones” (Lorenz, 1999, in Paquot, 2010:143).

The top 20 academic words in the published corpus were listed according to keyness values in relation to the student corpus by the WST program, and include items such as *data*, *research*, *analyses*, *variables*, *hypothesis*, *response*, *variance*, *predict*, *significant*, *estimates* and *selection*. The keyness values assigned to these items indicate that they occur predominantly in the published corpus but only infrequently in the student corpus. A cursory examination of these words suggests that they relate directly to the presentation of research. As the student essay is not a genre in which the writer’s own research is presented, while the journal article serves to a large extent as a forum for the discussion of research and related findings, consideration of genre provides a plausible account for the differences in frequency of occurrence. Similarly, a preliminary analysis of the words that occur primarily in the student corpus and less commonly in the published corpus also suggests that the differences are mainly topic related. The high frequency items listed include *theory*, *individual*, *identity*, *roles*, *gender* and *conflict*. These reflect a link to the essay topics assigned to the psychology students over the course of their undergraduate degree (see Appendix A). The word *theory*, for example, is noticeably key to the naming and description of a range of approaches in

psychology, as illustrated by examples of the L1 collocates: *behavioural, Bern's, biological, cognitive-developmental, Erikson's, Freud's, gender-schema* and *humanistic*.

In addition to the analysis of keyness, each analysed academic word was examined in terms of its top ten collocates, as illustrated in the example above. This analysis of collocates was conducted within the published and student corpora, with the aim of identifying patterns of use by student and published writers (§3.5.2.3a). This brief analysis provided further evidence of a strong genre and topic influence on the most frequently occurring academic words within these two corpora. However, given that the focus of the study is on the variation in vocabulary used by different student groups defined in terms of language background and academic level, the interest in published use of vocabulary is primarily as a benchmark in terms of which students' use can be assessed (§4.1). For this reason, these genre- and topic-based differences in vocabulary inherent to the types of texts required for journal articles on the one hand and academic essays on the other, is of less interest to this study than comparisons between various student groups.

As a means of investigating differences in the use of academic words by these student groups, several analyses were conducted on the basis of a measure of keyness in order to compare corpora for the L1 and AL student groups, as well as for the high and low achievers in the first, second and third-year groups. The results of these comparisons are discussed in the next section.

4.2.5.2 Comparison of academic vocabulary in L1 and AL corpora

The first comparison to be conducted was based on the academic vocabulary particular to the additional language students, with the first-language corpus serving as the reference corpus. The results are presented in Table 4.10 below.

Key word	Frequency in core corpus	Percentage in core corpus	Normalised rate in core corpus	Frequency in ref. corpus	Percentage in ref. corpus	Normalised rate in ref. corpus	Keyness value*
instance	430	0.04	36.45	198	0.01	10.42	233.68
hence	297	0.03	25.18	203	0.01	10.68	90.70
job	1 299	0.11	110.12	1 459	0.08	76.80	88.22
subordinates	103	0.009	8.73	49	0.003	2.58	53.89
code	105	0.009	8.90	69	0.004	3.63	34.44
evident	284	0.02	24.07	684	0.04	36.01	-34.19

Key word	Frequency in core corpus	Percentage in core corpus	Normalised rate in core corpus	Frequency in ref. corpus	Percentage in ref. corpus	Normalised rate in ref. corpus	Keyness value*
occurs	495	0.04	41.96	1 099	0.06	57.85	-36.54
individuals	1 538	0.13	130.38	2 990	0.16	157.39	-36.75
awareness	136	0.01	11.53	391	0.02	20.58	-36.85
occur	378	0.03	32.04	886	0.05	46.64	-39.08
previously	77	0.006	6.53	313	0.02	16.48	-62.61
community	1 195	0.10	101.30	2 544	0.13	133.92	-65.40
specific	504	0.04	42.72	1 262	0.07	66.43	-74.32
individual	2 891	0.25	245.08	5 725	0.30	301.36	-84.09

*Significant at $p < .0001$

Table 4.10³⁵: Academic words in the AL student corpus with significantly different frequencies from those in the L1 corpus

This table provides both positive and negative keyness values for the academic vocabulary in the AL corpus. While the positive values represent those words that occur more frequently in the AL corpus than in the L1 corpus, that is, those that are overused relative to the L1 corpus, the negative values represent results of the inverse relationship, that is, those words that occur more frequently in the L1 corpus than in the AL corpus, and so are underused in the AL corpus. As a means of delimiting the scope of this study in light of the fact that the keyness threshold for all of these academic words is higher than $p < .0001$, the focus of this analysis is restricted to those items that reflect substantial differences in the patterns of usage between the two corpora being compared.

The main methods applied in the course of this qualitative analysis were the investigation of concordance lines, as described in the methodology chapter (§3.3), and the study of short extracts from the students' essays based on extensions of the concordance lines, both of which serve to provide examples of actual use by the students. In each analysis, the primary focus was on the collocations in the immediate context of the key word. The first set of concordances to be considered focuses on the key word *instance* which has the highest keyness value in the AL corpus relative to the L1 corpus. A detailed investigation into the use of the word *instance* in both AL and L1 corpora reveals the following collocates:

1a. of marriage and in the absence of a father figure. In **this instance** children will take on their maternal last name,

1b. as her need for self-regard was slowly being met. A **key instance** in which we see that Precious had finally started

³⁵ KEY to Table 4.10: Normalised rate calculated per 100 000 words; core corpus – AL (1 179 619 tokens); ref. = reference corpus – L1 (1 899 689 tokens)

- 1c. things such as stealing. About three of them have had instance of excessive coughing though it was when they
- 1d. , 16 year old from a dysfunctional family does to a large instance perpetuate negative behaviour and actions but
- 1e. virtually interacting on their smartphones and at the same instance driving a car. However, there are positive and
- 1f. they already know, from a previous instant with the similar instance. This may increase someone's level of resilience
- 1g. by influences within the environment. In some instance one is not shaped by society, a person can
- 1h. detected by an authoritative figure, further exacerbated the instance of second hand smoking. This meant that the

The range of examples presented in these concordance lines serves to illustrate two correct uses of the key word *instance*, and a number of uses that are idiosyncratic. The phrase *in this instance* (1a) within the context of this sentence refers to a particular case, and so conforms to the generally accepted meaning of the word. The second example of correct use is provided in the phrase *a key instance* (1b). While a fairly uncommon collocation (LL: 10.70), this is both grammatically and semantically correct, and reflects a good understanding of the words *key* and *instance*.

As the focus of part of the study is on grammatically, semantically and collocationally idiosyncratic uses, the remaining examples illustrate the idiosyncratic use of *instance* both grammatically and semantically. Examples 1c and 1g represent the only cases in which the error is grammatical as *instance* is used in the singular form rather than in the plural (*have had instances* and *in some instances*). The phrase *large instance* in example 1d is an idiosyncratic use (LL: 8.49) which contrasts with the more standard adjectives preceding *instance* in the L1 corpus, such as *first* (LL: 31.65), thereby creating an unusual collocation (§3.5.2.3). The error in example 1e derives from apparent confusion of *instance* with *instant* ('a precise point in time'), although both words are incorrect in this context as the phrase 'at the same time' would more appropriately express the intended meaning.

The broader context in which example 1f occurs is presented below to assist in the construal of the intended meaning.

This also means that children have the ability to think thoroughly about the way in which they are being responded to in a particular incident, so, instead of not complying with the bully and end up being hurt, they would rather avoid that by giving the bully what they want as they already know, from a previous instant with the similar instance.

This example again stems from confusion between *instant* and *instance*, although in this case the student has juxtaposed both forms in an attempt, it would seem, to express the idea of *a previous instance*.

The last example in the list of concordances above (1h) appears to be based on confusion between the words *incident* and *instance* as the sentence would be more easily comprehensible were *instance* to be replaced by *incidents*. This is illustrated by the full extract from which the concordance line is drawn:

The fact that the smoking girls would secure and lock themselves within the toilet stalls for fear of being detected by an authoritative figure, further exacerbated the instance of second hand smoking.

It has been recognised that words with similar orthographical and/or phonological forms exacerbate the difficulties of learning new words, and so are often confused in the language acquisition process (Laufer, 1990, Nation, 2001 and Schmitt, 2010).

This detailed analysis of the various uses of the academic item *instance* provides some insight into what are likely to be typical problems experienced by additional language students in applying it correctly when writing. In addition to problems of incorrect use, the AL students are clearly overusing this form given the comparative normalised rates of occurrence (Table 4.10).

The next academic item to be considered from the AL student corpus is *hence*, which has the second highest keyness difference. This overuse is illustrated in the following extracts from the AL student essays:

2a. With that said it may be argued that it is hard to look at the self as solely private because of the interaction that exists as people are growing, hence being socialised. Therefore this helps in understanding that an individual may also be a subject of ideology used to form their identity, hence in South Africa, class and race were used together to formulate black and white identities

2b. Attention is a process of concentrating of specific features of the environment or on certain thoughts or activities. Hence when one speed reads they include selective attention which is when they exclude of other features of the environment, meaning that they keep focus to what they are reading and ignore distraction, hence this is done through the limited attention as well which is the in capacity and timing.

It is evident from extract 2a that *hence* is intended to convey the sense of the adverb *thereby* ('thereby being socialised') and the prepositional phrase *in this way* ('In this way, in South Africa, ...'). The first use of *hence* in extract 2b has the meaning *therefore* ('therefore when one speed reads'), and so is an example of the appropriate use of this word. However, the second use of *hence* in this extract is redundant and should be deleted as it does not add to the sense of cohesion or structure of the argument. Further examples of this are provided in the extracts below:

2c. **Since** its capacity is assumed to be limited hence a speed advantage could interact with the delay of information from working memory since less of the proceeding information would decay simply the reason being that of the passage of time.

2d. According to Durand individual with anorexia successful lose weight, **however** hence their fear of being obese or gaining weight encourage them to workout in order to maintain weight.

2e. **Due to** roles that were associated by men, hence they were views the specie that experience low stress and strain even if there are exposed to stressful situations.

2f. Skill variety is another factor that is not part of the job because the skills needed and used in this job are limited hence that is why the interviewees feel that their job is not significant.

In the case of 2c, 2d and 2e, the conjunction *since*, the adverb *however* and the adjective *due to*, respectively, which occur prior to *hence* make the use of the adverb unnecessary in that it does not add to the meaning being conveyed. Similarly, the phrase *that is why* in 2f makes the use of *hence* redundant as it conveys the same sense. These unnecessary insertions of the word *hence* may be regarded as semantic errors as they seem to reflect a poor understanding of the word's meaning and function within the context of each example.

The next set of examples serves to illustrate grammatical idiosyncrasies in the use of *hence*. It is clear from the analysis of concordance patterns in both the L1 and published corpora that *hence* is typically followed by a noun phrase, and less commonly by a prepositional phrase or a verb phrase. The ten most frequent R1 collocates in the L1 corpus are *the, it, they, we, this, there, perceptibility, in, women* and *these*. While there is a considerable amount of overlap between the most frequently occurring R1 collocates in both AL and L1 corpora, it is apparent that one of the sources of grammatical error in the AL corpus is the omission of either the subject or object following the use of the adverb *hence*, as illustrated in the concordance lines in Figure 4.1.

and it does differ due to the ratings of high levels of crime. Hence can be argued that it is the same crime and it situations in which the individual has to step up and act. Hence said earlier that in the process of developing as a their life until they achieve these goals (in adulthood) hence why the increase of these traits starts to become become more consistent yet retain the potential for age. Hence why it was mentioned in the introduction that

Figure 4.1: R1 collocations of the key word *hence* in the AL student corpus

It may be argued on the basis of the examples discussed in this section of the misuse of *hence* that many AL students appear to have only a vague understanding of the grammatical patterns and meaning of this word, with the result that it is often not used appropriately or in the correct context. The extracts from student essays below illustrate this point. In each example, the

word or phrase that would more appropriately replace *hence* is given in small capital letters at the end of the extract and underlined.

2g. The authority figure explains why their procedure is good and the reasons why it might be more effective hence resulting in cognitive change in those influenced. THEREBY

2h. A highlighted above Bud is desperate to make money therefore he employs reward political tactics in order to charm people hence get his way in. AND SO / THEREBY

2i. Thus it can be argued that speed readers are brilliant readers when they read some kinds of material for some purpose, hence when reading other kinds of materials for other purposes there is no relationship between speed of reading and the ability to comprehend. ALTHOUGH

2j. Members of the community involve themselves in different activities, such as sports, representing the Reith Hall community. In that way they tend to represent their community hence invest their personal. AND THEREBY

It may be concluded from this analysis that two of the more common mistakes being made by AL students in the use of *hence* result from confusion between *hence* and *thereby*, and from the overuse of *hence* where it should be completely omitted as it is either unnecessary in the context or the meaning is adequately conveyed by an alternative adverb, adjective or conjunctive.

The next set of concordances to be considered focuses on the key word *job*, which has the third highest keyness value. Other than the three examples presented below in which grammatical and semantic errors are evident, there are no cases of misuse of the key word or its immediate collocates. The first two examples given here (3a and 3b) are easily identifiable as omission of the possessive and plural forms. Example 3c, however, is more difficult to interpret as the argument seems to be contradictory in that “dropping” or presumably neglecting job performance should create more time for family responsibilities and consequently not interfere with these. Unfortunately the context in which this concordance line occurs does not serve to clarify the intended meaning.

3a. . The types of tools and equipment utilized in the **chef job** include gas stove, flat tops, grill, chip fryer, cutting

3b. men especially in sectors of safety and security. **Women's job** have high health risk factors such as toxic

3c. pressing demands. In work family conflict, individual **drops job** performance and this interferes with family roles and

Role overload is defined “as the degree to which individuals perceive themselves to be under time pressure due to the number of responsibilities they have in life”. This results in an individual concentrating all their energy and time on those pressing demands. In work family conflict, individual drops job performance and this interferes with family roles and responsibilities.

A predominant feature within the AL corpus with regard to *job* is its repeated use within single paragraphs, suggesting overuse by the AL students. This pattern occurs in a number of student texts, as illustrated in the extract given below (3d).

3d. Holman suggests that job design has to do with structuring of the actual features of a job itself. This entails the amount of time, the type of job, what skills are required and how difficult the job is. Redesign in the light speaks of the elements that need to be restructured in order to bring about organisational effectiveness. This also includes the design of where and when the job is done. Included in the description of job redesign techniques are job enlargement, job simplification, job enrichment, and job rotation. Studies conducted under the mediating role of job characteristics in job redesign interventions conclude “that the effects of employee participation in job redesign on well-being are a result of changes in job characteristics rather than participation in change per se”.

While the academic item *job* is key to this essay in which students were required to analyse various aspects of a job of their choice and make recommendations for improvements, there is little evidence that the L1 students repeated the key word *job* to the same extent as is evident in the AL corpus. It is clear that these students could have avoided such repetition through the use of pronouns, synonyms such as *work* where appropriate, and omission. The L1 corpus example below illustrates these points in changes made to 3e.

3e. The job specific's entails aspects ~~of the job~~ that are separate from the organisation in which the individual works in. The specific job that this essay will explain in-depth is that of two bus drivers at Regina high school who preferred to remain anonymous. Furthermore, in order to construct a detailed job analysis I made sure that the two participants were from the same hierarchical ranking within the organisation, because that would enable me to gain information about the job itself rather than the personal opinions ~~about the job~~ of the employees.

This exercise illustrates that AL students would not only benefit from workshops in which the appropriate use of cohesion markers in general is clarified, but would also benefit from strategies on how to avoid unnecessary repetition in their writing. These and other recommendations are explored in Chapter 5.

The next item with a significant keyness value in the AL student corpus is the noun *subordinates*. The most notable difference between the AL and L1 corpora with regard to *subordinates* is the use of collocates. These are listed in Table 4.11 below.

Collocates of <i>subordinate</i> in AL corpus		Collocates of <i>subordinate</i> in L1 corpus	
Collocate	LL value	Collocate	LL value
superiors	144.90	teacher	74.57
leaders	109.34	managers	43.89
influence	72.84	allows	45.88
power	72.03	transparency	41.23
transparency	61.90	have	34.32
leader	57.02	communication	28.90

Table 4.11: Common collocates of subordinates in the AL and L1 corpora

It is interesting to note that, while the collocates in the AL corpus clearly relate to the theme of 'leadership', the collocates within the L1 corpus are more disparate and less easily classified. (The phrase *teacher subordinates* is used with reference to those who report to a head teacher.) It is possible that the main reason for the discrepancy between AL and L1 speakers in the use of the word *subordinates* links to the negative connotations associated with this word which mother-tongue speakers may be more aware of. As there is no clear evidence from concordance lines of distinctive patterns in the use of the word *subordinates* in the AL and L1 corpora, it is not explored in further detail.

Finally, as with the use of *subordinates*, there is little indication of substantial differences in the use of the academic word *code* in the AL and L1 corpora, with the result that it is not examined in detail here.

The focus of this analysis now shifts from overuse to underuse by the AL students in relation to the L1 speakers. Of the nine items in Table 4.10 with a negative keyness value, only those that revealed particularly interesting differences are discussed in detail.

Investigation into the use of the word *specific* in the AL corpus revealed two non-standard patterns. The first relates to the phrase *to be specific*, and the second to the phrase *in specific*. The first set of concordance lines provided below suggests that AL students are confusing the adjective *specific* with the adverb *specifically*.

4a. feel that as a humanities student, in social work to be specific, I do relate with the community in a professional

4b. of failing to develop resilience, adolescent's period to be specific is seen as a time of risk. And these risks are

4c. the latter may occur particularly in young women to be specific, and how it may shape youth identity through the

- 4d. evident that people and other species, chimpanzees to **be specific** use tools to carry out tasks hence form culture.
- 4e. to discuss the identity development and violent crime **using specific** Erikson's theory of psychosocial theory.

It is evident that replacing the phrase *to be specific* with the adverb *specifically* would make the interpretation of these extracts easier to understand, although 4a and 4d also require a change in the word order, with *specifically* occurring before the prepositional phrase 'in social work' in 4a, and before the noun 'chimpanzees' in 4d. In addition to these grammatical errors involving parts of speech, it is clear from both 4c and 4e that the use of *specifically* would in fact be redundant. In the case of 4c it is preceded by *particularly* which expresses the same meaning, and in 4e it is superfluous and can be omitted without any loss of meaning. The examples above from the AL corpus contrast clearly with those in 4f and 4g from the L1 corpus as these represent more standard uses of the phrase *to be specific*.

- 4f. . Therefore, eating disorders in South Africa appear to **be specific** to adolescent females within an urban
- 4g. an individual's life course development, there appear to **be specific** indicators that need to be established in order for

A further point of interest in relation to the AL students' use of the copula verb *be* immediately before *specific* is that, while it is clearly used to express conditionals in the published corpus, there is no evidence of this use in the AL corpus. The examples below, taken from the published corpus, serve to illustrate this point as the phrase *be specific* is preceded by a modal expressing possibility.

- 4h. the addressees in both conditions. The behaviors might **be specific** to teaching children. Against this interpretation is
- 4i. argument earlier that results from forced choice could **be specific** to that method. If we are to disregard results
- 4j. a caveat in interpreting our data is that this effect may **be specific** to our experimental conditions, in that we

The following extract from the AL corpus illustrates that the use of 'may' in the phrase *may be specific to* does not convey a conditional but carries the meaning of the phrase 'can be applied to', thereby conveying possibility.

- 4k. Defining father absence has been an issue in present research as the definition may be specific to the researcher or the society in which the research is conducted.

The second idiosyncratic pattern of use relating to *specific* is evident in the following concordance lines from the AL corpus.

- 4l. to say on the subject in general as well as pretend play *in specific* attributing to it a role more often in cognitive and
4m. family and work roles and lower satisfaction. Women *in specific* are faced with numerous challenges when

These examples are similar to those discussed in 4a to 4e as they reflect a degree of confusion as the preposition + adjective *in specific* should be replaced by the adverb *specifically*. Reference to the published corpus clearly illustrates that the phrase *in specific* is typically followed by a plural noun form (4n to 4q).

- 4n. a theory designed to predict and explain human behavior *in specific* contexts. Because the theory of planned behavior
4o. to genetic factors that define propensities to grow *in specific* directions at specific ages during the life course.
4p. dispositions tend to be poor predictors of behavior *in specific* situations. General attitudes have been assessed
4q. GMV. Nonetheless, the presence of structural deficits *in specific* regions may be important for the interpretation of

The last two examples from the AL corpus are idiosyncratic as there is no clear evidence of a pattern. The extracts 4r and 4s suggest that the adjective *specific* has been confused with the non-count noun *specifics*, thereby creating grammatical errors – the first based on the omission of the plural form –s, and the second based on the use of a possessive rather than a plural marker.

- 4r. and qualitative. Qualitative changes are changes *in specific*, structure or arrangement that makes an
4s. bus routes continuously can be implemented. The *job specific's* entails aspects of the job that are separate from

The discrepancy in the use of *specific* by the L1 and AL groups may be due to the AL students' apparent confusion over the correct applications of the adjectival form, with the result that they are more likely to avoid using it than are the L1 students.

An analysis of the word with the third highest negative keyness ranking, *community*, as used by the AL and L1 students, shows little real difference between the two corpora, presumably because the word is unambiguous in the context of the third-year essay in which it was used (Appendix A: Corpus references). There is a considerable degree of difference, however, in the frequency of occurrence of the pronoun *my* immediately preceding *community*. This pronoun has a frequency of 2% in the AL corpus, with the collocational pairing having a log-likelihood ratio of 104.16. In the L1 corpus, on the other hand, the pronoun *my* has a frequency of 4%, with a far higher log-likelihood ratio of 1036.5. It may be argued that the far more predominant use of *my* to describe *community* in the L1 corpus reflects the first-language students' greater use of the first person in this essay. This inference is supported to some

degree by the collocational links between the pronoun *I* and the key word *community*, which were stronger in the L1 corpus (LL: 431.82) than in the AL corpus (LL:308.47). It is possible that, although the essay topic encouraged use of the first person, the additional language students are less confident about their writing skills than the first-language students, and so more reluctant to move away from the more conventional use of the third person. This interpretation is supported by Hyland’s argument regarding the writer’s stance or position in student assignments. Hyland (2002:1091) proposes that the reluctance to use the first person in academic writing is particularly problematic for L2 writers as “the individualistic identity implied in the use of *I* frequently runs counter to the representations of self inherent in their own cultures. As a result, in subsequent research, Hyland (2012:66) found that “in a corpus of research articles ... half the occurrences of *I* collocated with the presentation of arguments or claims, while this was the least frequent use in undergraduate reports, where writers were reluctant to make such strong personal commitments and instead mainly used *I* to state a purpose”. As this line of conjecture raises a number of questions, the density of reference to first person as opposed to third person, and the use of agent-evacuated passives could be a matter for future research.

As there is little evidence of difference between the corpora in the use of the adverb *previously*, the next item to be examined is *occur*, which has the fifth highest negative keyness value. While the way in which this verb is used in both corpora follows the same pattern, there is a substantial difference in the density of modals before the verb. In support of this claim, the following table shows the log-likelihood values for a selection of modals which collocate with *occur* in each student corpus:

Modal	LL value	LL value
	- AL corpus	- L1 corpus
can	293.59	864.07
may	133.14	747.01
will	128.45	575.46
might	26.16	53.62
could	24.70	121.63

Table 4.12: Modal collocations for the key word *occur* in the AL and L1 corpora

These log-likelihood values indicate that there is a far stronger association between the verb *occur* and the preceding modals in the L1 corpus than in the AL corpus. Although *will* expresses intent, the remaining modals indicate possibility or probability, suggesting that the first-

language students are more inclined to hedge their arguments, while AL students tend to be more assertive, using fewer qualifiers, as argued by Hyland (1994).

The discussion of *occur* concludes the detailed comparative analysis of select words that have significantly different frequencies in the AL and L1 corpora. Despite the apparently disparate issues discussed in this section, qualitative, corpus-driven comparisons of these fairly substantial AL, L1 and published corpora provide fine-grained analyses that help to explain very specific problems encountered by AL students in using academic words, while at the same time helping to explicate the broader quantitative findings of overuse and underuse. The overall impression gained from this analysis is that the use of these academic words by first-language students more closely approximates that of the published writers than does the use by additional language speakers.

The next section is a comparison of the use of specific academic words by students categorised according to academic performance.

4.2.5.3 Comparison of academic vocabulary in high and low achieving student groups

As the use of academic words by the high achievers at first-year level did not differ significantly from that of the low achievers, the discussion in this section focuses on words from the second- and third-year corpora.

Only two words in the second-year corpus of low achievers differ significantly in terms of frequency from those used by high achievers, that is, *whereby* and *principle*. Table 4.13 illustrates that, while *whereby* is overused by low achievers in relation to high achievers, *principle* is underused. These differences are explored in this section.

Key word	Frequency in core corpus	Percentage in core corpus	Normalised rate in core corpus	Frequency in ref. corpus	Percentage in ref. corpus	Normalised rate in ref. corpus	Keyness value*
whereby	145	0.04	41.85	76	0.02	18.29	36.27
principle	44	0.01	12.70	151	0.04	36.35	-44.27

*Significant at $p < .0001$

Table 4.13³⁶: Academic words in the PSY200 low achievers student corpus with significantly different frequencies from those in the PSY200 high achievers' corpus

³⁶ KEY to Table 4.13: Normalised rate calculated per 100 000 words; core corpus – PSY200 low achievers (346 437 tokens); ref. = reference corpus – PSY200 high achievers (415 415 tokens)

According to the Cambridge International Dictionary of English (1995), the standard meaning of *whereby* is “by which way or method”, while the application of *whereby* to mean “in which” is non-standard. This word is therefore typically used to show an instrumental relationship, and may be expected to follow nouns such as *approach*, *effect*, *procedure*, *process*, *means* and *method*. Although these uses are evident in the published corpus, there is clearly a considerable amount of latitude in the use of *whereby* within the writing of low achievers, as indicated by the examples below.

- 5a. . In that case, if the child is exposed to domestic **abuse** *whereby* the parents of the child engage in physical or
- 5b. she is asked by her teacher. The concept of the self **is** *whereby* the individual notices themselves consciously as
- 5c. of the self as well. This then creates an **atmosphere** *whereby* the experiences that are seen as enhancing the
- 5d. is seen as being the same as many patriarchal **societies** *whereby* men are traditionally allowed to physically punish
- 5e. transition from childhood to adolescence is ongoing **change** *whereby* all individual go through. When individuals
- 5f. had to move between different family members in **cases** *whereby* their mother had passed away and their fathers
- 5g. from their parents. This took place in the post-war **context** *whereby* bereavement and deportation were most prevalent
- 5h. discussed above, Precious had reached a point in her **life** *whereby* nothing else mattered except doing anything that
- 5i. . For example this is seeing in the hijacking of **car** *whereby* most whites are the ones who are high jacked.
- 5j. , many South Africans had experienced violent **crimes**, *whereby* they were either victims of violent crimes,
- 5k. only takes place through a system of several processes **of** *whereby* each is concerned with the representation of the
- 5l. classmates and her new teacher at each one teach **one**. *Whereby* she started being interested in sitting in the

The examples illustrate a range of uses, from introducing details (5a and 5b) to meaning ‘in which’ (5c-5d), ‘which’ (5e), ‘where’ (5f), ‘when’ (5g and 5h), and ‘as’ or ‘since’ (5i and 5j). There is also evidence of grammatical errors, as in 5k where a preposition rather than a noun phrase or a verb phrase is used immediately before *whereby*, and in 5l, where the conjunction is used in sentence-initial position. The extracts below (5m and 5n) clearly reflect the extent to which *whereby* has generally been overused by low achievers, with more suitable alternatives provided in brackets at the end of each extract.

5m. Research shows that exposure to violence affect boys and girls behaviour differently, whereby traditionally boys would act out and display the violent acts they are exposed to against others while girls display emotional feelings like being sad and lonely, however recent studies show that the roles seem to have changed whereby the boys seem to also display emotional feelings and girls seem to be more aggressive than usual. (SINCE OR Ø, AS)

5n. It could be argued that the therapist in the film took this passive approach, whereby she allowed for Precious to take hold of the therapy session. She asked her very minimal question, whereby she expected Precious to respond and do most of the talking. (AS, AND)

The fact that the first instance of *whereby* in 5m could be omitted completely suggests that students occasionally use it to force a link between sentences in an attempt to create the semblance of an argument. This use provides further evidence that, while *whereby* is perceived as a linker, the real sense of the word does not seem to be clearly understood. Although there is less evidence of the diversity of uses employed by the low achievers in the writing of the high achievers, there is nevertheless a degree of variation in the application of *whereby*, as illustrated by the examples below.

5o. , even though its definition has a bit of **contradictory** *whereby* it suggests that change does occur but it does

5p. was due to her upbringing and socialized **experiences**, *whereby*, her mother constantly utters bad words to her

5q. has severe consequences on the women of that **society**, *whereby* violence is mainly used to uphold male

5r. to speak each word to themselves as fast as they **can**, *whereby* still retaining the content of the text. Carver

As with the low achievers, *whereby* is used here to introduce detail (5o), and to mean 'in which' (5p), 'where' (5q) and 'while' (5r). However, the standard use is applied more often than in the low achiever corpus as it follows phrases such as *feedback activation*, *eye movement behaviour*, *identity foreclosure*, *positive regard*, *psychosocial development*, *socialised experiences* and *top-down processing*.

In contrast to the positive keyness value of *whereby*, *principle* has a negative keyness value, reflecting a particularly low frequency of occurrence in the low achiever corpus where it is used in the sense of primary, basic idea as well as the head of a school, with the latter use based on the incorrect spelling of *principal*. Similarly, both senses of *principle* are used in the high achiever corpus, including the misspelling of *principal*. However, the high achievers use terms such as *continuity principle*, *discontinuity principle*, *developmental principle*, *epigenetic principle*, *likelihood principle*, *orthogenetic principle* and *psychological principle*, while the low achievers refer to only *epigenetic* and *psychological principles*. The greater proportion of technical terms evident in the high achiever corpus may be compared with the similar finding in the L1 corpus (§4.2.5.2). One of the possible inferences to be drawn from this finding is that the high achievers may be more comfortable employing psychology terms in context as they seem less inclined to avoid such terms in their essays. However, it must be noted that this is a tentative conclusion that could be tested by means of further research into the use of academic vocabulary and technical terms by low achievers at undergraduate level.

Before considering the results of the keyness analysis for the high and low achieving students in the third year, it is necessary to provide a breakdown of the third-year essays submitted by

each group. There are considerable differences in the two sets of submissions, which account in part for the differences in the academic vocabulary used by the high and low achievers as the vocabulary is naturally linked to theme. These figures are presented in Table 4.14 below, with the higher percentage of submissions in each essay highlighted in bold.

Course code	Theme and topic	Low achievers - number ³⁷	Low achievers - percentage ³⁸	High achievers - number	High achievers - percentage
PSY3001	Abnormal psychology - eating disorders	36	67.92	24	45.28
PSY3013	Cognitive psychology - multitasking	20	37.73	25	47.17
PSY3015	Health psychology - smoking intervention	26	49.06	15	28.30
PSY3016	Community psychology - urban communities	26	49.06	6	11.32
PSY3017	Psychotherapeutic interventions	19	35.85	15	28.30
PSY3018	Child and adolescent psychology	13	24.53	8	15.09
PSY3019	Critical social psychology - self-help literature	16	30.19	7	13.21
PSY3020	Organisational behaviour - role of leadership	4	7.55	21	39.62
PSY3021	Employee well-being - work/family balance	6	11.32	23	43.40
PSY3022	Employment relations - 'Wall Street'	5	9.43	22	41.51
PSY3023	Organisational psychology - job analysis	9	16.98	24	45.28
PSY3034	Cognitive studies - childhood pretend play	28	52.83	22	41.51

Table 4.14: Number and percentage of each third-year essay submitted by low and high achievers

It is immediately apparent from this table that the high achievers tended to select essays on the topic of organisational psychology as the four essays with this theme have a far higher percentage of submissions by the high achievers. This factor is clearly relevant in the analysis of differences in keyness values.

³⁷ There are 53 students in each performance-based group

³⁸ Percentage of the number of students in the group

A comparison of the third-year corpora of low and high achievers shows that 21 of the academic words have a significantly high keyness value, three with a positive keyness indicating overuse by the low achievers in relation to the high achievers, and the remaining 18 with a negative keyness, indicating underuse. These results are presented in Table 4.15 below.

Key word	Frequency in core corpus	Percentage in core corpus	Normalised rate in core corpus	Frequency in ref. corpus	Percentage in ref. corpus	Normalised rate in ref. corpus	Keyness value*
community	1440	0.38	384.32	534	0.11	108.35	718.74
diversity	81	0.02	21.62	19	0.004	3.85	60.26
intervention	421	0.11	112.36	363	0.07	73.65	34.91
financial	39	0.01	10.41	135	0.03	27.39	-33.00
expert	31	0.008	8.27	118	0.02	23.94	-33.12
roles	409	0.11	109.15	763	0.15	154.81	-33.57
stress	132	0.04	35.23	314	0.06	63.71	-34.96
role	476	0.13	127.04	875	0.18	177.54	-35.60
policies	15	0.004	4.00	86	0.02	17.45	-37.58
jobs	61	0.02	16.28	188	0.04	38.14	-37.79
code	21	0.006	5.60	107	0.02	21.71	-42.01
despite	38	0.01	10.14	151	0.03	30.64	-44.88
principles	33	0.009	8.81	141	0.03	28.61	-45.85
stressors	34	0.009	9.07	145	0.03	29.42	-47.04
domains	23	0.006	6.14	122	0.02	24.75	-49.76
outcomes	74	0.02	19.75	246	0.05	49.91	-56.38
domain	43	0.01	11.48	218	0.04	44.23	-85.19
corporate	17	0.004	4.54	172	0.03	34.90	-108.77
ethical	14	0.004	3.74	195	0.04	39.56	-141.33
conflict	223	0.06	59.51	837	0.17	169.83	-230.63
job	408	0.11	108.89	1230	0.25	249.57	-237.62

*Significant at $p < .0001$

Table 4.15³⁹: Academic words in the PSY300 low achievers student corpus with significantly different frequencies from those in the PSY300 high achievers' corpus

The discussion of these items focuses on the three words with a positive keyness value (*community*, *diversity* and *intervention*), as well as the three words with the highest negative keyness value (*job*, *conflict* and *ethical*).

³⁹ KEY to Table 4.15: Normalised rate calculated per 100 000 words; core corpus – PSY300 low achievers (374 691 tokens); ref. = reference corpus – PSY300 high achievers (492 853)

The fact that *community* has the highest keyness value is due primarily to the difference in the number of submissions of the essay on community psychology by the low achievers as opposed to the high achievers (Table 4.14). The extent to which *community* is used in a single essay is illustrated in the two extracts below (6a and 6b).

6a. This narrative essay is discussed around the community called HeronBridge Community Church. This community has been going for ten years now. Their heart behind their church organization is the fact that it is specifically a community church. Many churches have communities within them and work on building community but HBCC definitely live true to their name in the sense that they are a small community.

6b. This essay can be concluded by considering Lenasia to be a 21st century urban community by relating the community to defined sense of community which explains that there are perceptions of belongingness, mutual commitment and interdependence that links individuals of the community in a form of unity. Lenasia is reaching new peaks and levels as its transformation from a suburb formed through the group areas act now stands as a well rounded community catering for the needs, desires and wants of the community through mutual community support and interaction.

It should also be noted that, as in the comparison of the use of the word *community* by AL and L1 students (§4.2.5.2), the pronoun *my* occurs more frequently before this key word in the high achievers' corpus (4%) than in the low achievers' corpus (1%). In addition to the obvious explanation that the top achievers refer more often to their own community in the course of this essay, this may again illustrate the degree of confidence which the high achievers feel in using the first person rather than the third person when expressing an opinion (Hyland, 2012).

The word *diversity* has the second highest keyness value in Table 4.15. Although in two cases (7a and 7b) this noun is used by the low achievers as an adjective, it is used correctly in all other instances, with adjectives such as *cultural*, *ethnic*, *human*, *increased*, *phenomenal* and *vast* occurring as qualifiers before the noun.

7a have placed in they are becoming more desensitize **by diversity** factors. I had a challenging time deciding what

7b there are also conflicts and boundaries that come **with diversity** issues. Alexandra accommodates different people

The collocates that occur most commonly with *diversity*, including *human*, *racial*, *cultural* and *South African*, indicate that this word was used by both high and low achievers to discuss evidence of diversity within South African cultures. This theme relates to the topics presented for abnormal psychology, community psychology, psychotherapeutic interventions, and child and adolescent psychology, all of which were selected by a greater proportion of low achievers than high achievers (Table 4.14). As with the word *community*, the preference for these essay topics by the low achieving group would explain the positive keyness value.

The item with the third highest positive keyness value, *intervention*, can again be explained in terms of essay preferences. While 49% of the low achievers selected this topic, only 28% of the high achievers opted to submit the essay on smoking intervention (Table 4.14). The difference in numbers clearly accounts for the proportional use of *intervention* in each corpus as it was a key word in the health psychology essay. This argument is supported by the top five collocates for *intervention* presented in Table 4.16 below, as there is considerable overlap between the two lists, indicating that *intervention* was used in similar ways in both corpora.

Low achievers - collocates	Log-likelihood value	High achievers - collocates	Log-likelihood value
smoking	219.79	smoking	193.54
cigarette	207.44	plan	160.23
proposed	206.18	proposed	153.98
implemented	167.68	implemented	128.13
weaknesses	161.16	order	111.27

Table 4.16: Top five collocates of intervention in low and high achievers' corpora

The arguments provided above for the positive keyness differences in the words *community*, *diversity* and *intervention* apply equally to the three words with the highest negative keyness values: *job*, *conflict* and *ethical*. These words occur with particularly high frequency in the essays preferred by the high achievers (Table 4.14), that is, those relating to organisational behaviour, employee well-being, employment relations and organisational psychology, as evident from the collocations for each word in Table 4.17.

The word *job* relates most directly to the organisational psychology essay topic (PSY3023) which was selected by 45% of the high achievers but only 17% of the low achievers. This essay required students to analyse certain features of a particular job. While the collocates for both low and high achievers clearly relate to this topic, it is of interest to note that the low achievers use the non-standard form *job characteristic* more frequently (4%) than the more standard *job characteristics* (2%). The high achievers, on the other hand, tend to use the phrase *job characteristics* (8%) in preference to the non-standard singular form (0.5%). Furthermore, while both groups use the nouns *analysis*, *demands*, *description*, *design*, *enrichment*, *improvement*, *opportunities*, *performance*, *rotation*, *satisfaction*, *specification* and *training* immediately after the key word, the high achievers also use the words *autonomy*, *content*, *control*, *incumbent*, *involvement*, *motivation*, *occupant*, *redesign*, *requirement*, *sharing*, *simplification*, *stress* and *tasks* in the R1 position, suggesting a broader range of vocabulary than is available to the low achievers.

Low achievers - collocates	Log-likelihood value	High achievers - collocates	Log-likelihood value
job –		job –	
enrichment	268.32	characteristics	1 074.78
design	265.77	design	722.64
rotation	239.41	analysis	482.59
characteristic	163.90	simplification	478.07
description	117.74	enrichment	437.04
conflict –		conflict –	
work	874.73	work-family	8 608.74
family	823.17	experience	1 306.26
work-family	459.10	role	1 164.67
role	259.41	work	1 132.52
experience	123.96	family	992.73
ethical –		ethical –	
manner	24.43	code	273.99
King	22.90	issues	257.15
code	16.18	principles	202.19
principles	13.42	transparency	202.18
report	10.79	accountability	170.35

Table 4.17: Top five collocates of job, conflict and ethical in low and high achievers' corpora

The word *conflict* is clearly used in very similar ways by both low and high achievers, with almost no contextual difference in usage between the groups. The significant negative keyness is therefore accounted for by the low and high achieving students' preferences for different essay topics. The term *conflict* links specifically to the essay topic on work/family balance and conflict (PSY3021), which was selected by 11% of low achievers and 43% of high achievers (Table 4.14).

The word with the third highest negative keyness value, *ethical*, links to two essay topics. The first is on organisational behaviour, and looks specifically at transparency and accountability in the role of leadership (PSY3020). This essay requires reference to the King Report which provides recommendations for the ethical principles of psychologists and the code of conduct. The second essay is on employment relations, and considers ethical issues which arise in the movie 'Wall Street' regarding trading and good business practice (PSY3022). The essay topic for PSY3020 was selected by 8% of the low achievers and 40% of the high achievers, while the topic for PSY3022 was selected by 9% of the low achievers in contrast to 42% of the high

achievers (Table 4.14). Examination of the contextual use of *ethical* in the writing of high achievers reflects a far wider range of collocations which suggests a broader lexical network of associated words. For example, R1 collocates in the low achievers' corpus are limited to *assumptions, authority, behaviour, issues, manner, principles, procedure, standards, trade* and *values*, while R1 collocates in the high achievers' corpus also include *accounting, business philosophy, code, conduct, corporate culture, dilemma, foundations, frameworks, governance, leadership, morals, path, practice* and *treatment*.

Findings from the qualitative study are included in the discussion which follows.

4.2.6 Discussion of findings

One of the patterns that emerged in the course of the qualitative analysis served to support the assumption that first-language students have a better grasp of academic vocabulary than additional language students as there are a greater number of grammatical, semantic and collocational idiosyncrasies in AL writing. Examples from the AL corpus include the overuse of certain academic words, the non-standard use of adverbs such as *hence*, unusual collocations linked to academic vocabulary, confusion between parts of speech such as adjectival and adverbial forms, as well as between similar lexical forms (§4.2.5.2), and a restricted range of vocabulary items, which reduces the number of options for collocational pairings, as found by Nizonkiza (2014). Examples from the L1 corpus, on the other hand, reflect more prolific use of the first person, and a greater range of collocations in relation to academic words. The qualitative analysis also confirmed that high achievers tend to use a broader range of academic words than low achievers. While findings such as these illustrate the depth of analysis possible in corpus-based studies of this kind, there is, however, little evidence to support the idea that academic vocabulary contributes significantly to performance in the case of stronger students. This discussion is an attempt to account for this weak correlation, as well as for the decrease in significant correlations between the use of academic vocabulary and essay results from first year to third year.

Following from the argument that the 5000-word level is essential for academic reading and writing (§4.2.1.2), I propose that vocabulary is a significant variable for students below the threshold level of 5000 words, but plays a less critical role as general competence increases and other variables come into play. This ties in with Cummins' (1981) threshold hypothesis in terms of which first-language knowledge and skills can only be transferred to the second language once learners have attained a threshold of L2 knowledge (Brisbois, 1995) (§2.3.4). Brisbois goes on to argue that "the critical nature of vocabulary knowledge to L2 reading

comprehension is apparent particularly at the beginning levels of language study” (Brisbois, 1995:580-581). In her study of the contribution of L1 reading, L2 vocabulary and L2 grammar to reading comprehension in the second language, Brisbois found that vocabulary scores were the primary contributors to reading scores for beginner learners, accounting for 10.1% of the variance, although dropping as students advanced, and so accounting for only 6.3% of the variance in higher levels. She concludes that “as L2 vocabulary knowledge gradually increases, and readers gain in automaticity, various reading strategies and skills can be used more and more” (Brisbois, 1995:578).

Vocabulary therefore appears to play a key role for those below a certain lexical threshold. For this reason I would argue that it is far more viable as a predictor for students from a disadvantaged educational background than for those from historically advantaged and private schools. Scheepers (2014:3) describes these as “the best resourced and managed schools and in this system the majority of children (black and white) perform well on literacy and numeracy measures”. As discussed in Chapters 1 (§1.2) and 3 (§3.5.1), the University of the Witwatersrand (Wits), at which the current study was located, is one of the more prestigious in South Africa. As a result, it tends to attract the more advantaged students, as evidenced by the fact that the mean of the overall year marks for the participants’ first, second and third years of psychology was relatively high (67%, 66% and 68%, respectively), with the lower marks in the 50s (refer to Table 3.11, §3.6.1) for means and standard deviations of both essay results and overall year marks). Students at the University of South Africa (Unisa), on the other hand, are more often from disadvantaged backgrounds, with the result that “their exposure to English is in many cases inadequate ... and [they] may have only a developing knowledge of academic English in particular” (Scheepers, 2014:3).

The difference in the productive vocabulary test results obtained in the Unisa context and in the context of Wits University seems to support the lexical threshold hypothesis. Scheepers (2014:148) found that students’ scores for the 5000-word level and academic vocabulary correlated most highly with examination results (.62 and .60, respectively). This is in line with research conducted by Cooper (1999) which showed that academic vocabulary contributed most significantly to the academic performance of first-year students at Unisa. However, the results of my present study show a weak correlation between the 5000-word level, academic vocabulary and academic performance, with only the 10 000-word level serving as a predictor of academic performance. In other words, while the 5000-word level discriminates between low achievers and high achievers at Unisa, it does not discriminate effectively between Wits students. Since the Wits students generally have a good grasp of the 5000-word level, discrimination between the high and low achievers in the Wits population only occurs at the

10 000-word level. I would argue that the reason why the Wits students are only weakly distinguished at the 5000 level is that they are more proficient than those from Unisa. This line of argument supports the threshold hypothesis as the strong correlation at Unisa is based on the fact that there is a significant degree of overlap between the students with a good grasp of the 5000-word level and those who performed well academically (i.e. obtained an average of 50% or higher and so passed).

Evidence that these findings link up with the threshold hypothesis is therefore found in the students' performance within the disadvantaged context of Unisa as opposed to the more advantaged context of Wits, and supports the view that, below the 5000 level, poor vocabulary negatively impacts reading comprehension (Clark and Ishida, 2005), but above the 5000 level, other factors come into effect. This argument is dependent on the strong correlation that has been shown between reading proficiency and academic success (Pretorius, 2000:35; Stæhr, 2008). Analogous to the threshold hypothesis, Clarke (1980:260) refers to the short-circuit hypothesis in which limited language proficiency negatively influences or "short circuits" the good reader's system, causing him/her to revert to poor reader strategies when confronted with a difficult or confusing task in the second language". In line with both the threshold and short-circuit hypotheses, vocabulary may be seen as a good predictor of academic performance at the lower frequency levels, but as less of an influential factor at the higher levels when other variables such as inferencing skills and the ability to track anaphoric references should be accounted for in the assessment of the higher-order reading skills required for comprehension (Pretorius, 2000:33).

The weak correlation between the use of academic vocabulary and academic performance in the Wits context is reflected in the difference in means between the L1 and AL students' vocabulary test results (§4.2.1.2, Table 4.3), and corresponding academic results. This may be viewed as providing further support for the argument that the 10 000-word level is a more reliable predictor of academic performance than the 5000 or academic word levels when students are fairly strong academically and so have passed beyond Cummins' (1981) lexical threshold.

In line with Nation's view that "words are not isolated units of language" (Nation, 2001:23), Hancioğlu et al. (2008:463) propose that the key feature of an academic text is "the ways in which certain items 'collocate' and 'colligate', in other words, the ways lexical items co-occur with other lexical and grammatical items". As the findings of this study reflect that academic vocabulary does not appear to contribute significantly to academic performance, the next step

was to investigate the relationship between multiword sequences and academic performance. The next section presents the findings of this investigation.

4.3 Lexical bundles

Although there is a degree of parallelism between the formulation of hypotheses for vocabulary and for lexical bundles, twice as many were formulated for bundles in order to take into account both structural and functional types. As with the operational vocabulary hypotheses, each lexical bundle hypothesis is presented, tested and the results are then discussed. The findings of the qualitative examination of lexical bundle data are explored in relation to the quantitative findings, and key aspects of the findings summarised and discussed in conclusion to the section on lexical bundles.

4.3.1 Lexical bundles and performance (HLB1)

HLB1 (Lexical bundles and performance hypothesis)

Students whose use of lexical bundles approximates that of published writers more closely are more likely to perform well academically.

The first main hypothesis relates to the use of lexical bundles by students in relation to their use by published writers. In order to explore this hypothesis, it is necessary to operationalise certain aspects so that these can be directly tested. One of the key aspects requiring operationalisation is the word ‘use’ which is interpreted in terms of density of occurrence in HLB1a, and in terms of appropriateness in the qualitative analysis (§4.1).

4.3.1.1 Lexical bundles (density) and performance (HLB1a)

HLB1a Lexical bundles (density) and performance hypothesis:

There is a positive relationship between the density of target bundles in student writing and the students’ academic performance, as measured by their essay results.

This hypothesis ties in with the assumption that lexical bundles, whether specific to a discipline or occurring more generally, play a key role in expository writing and the phrasing of academic argument, as argued in Chapter 2 (§2.3), and that students who use a relatively high proportion of appropriate lexical bundles in their essays are more likely to perform well academically. For the purposes of this analysis, ‘target bundles’ were operationalised as the 150 most frequently occurring lexical bundles in the published corpus, and were identified by means of WST

(§3.5.2.3). The elimination of context-specific bundles from this list reduced the number selected for analysis from 150 to 118, as listed in Appendix S.

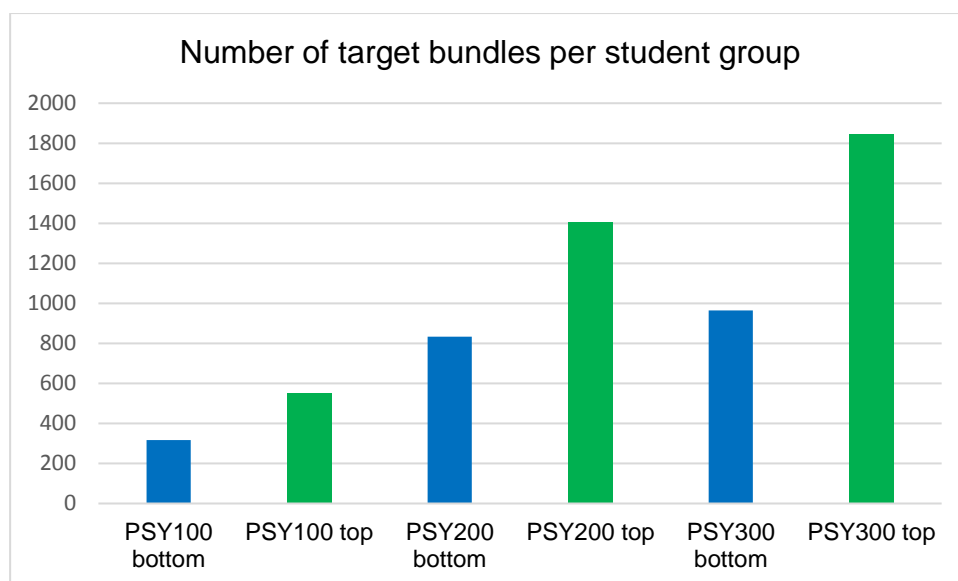
This hypothesis was tested by conducting frequency counts based on the number of target bundles used by students in each academic year, with the aim of establishing the density of target bundle use. The students had been separated into groups according to their average essay results for the year – the top third and bottom third performers were identified as the high and low achievers, and each group’s use of target bundles analysed separately. The results are presented in the form of descriptive statistics, giving the frequency counts and related percentages, as shown in Table 4.18 below.

	No. of texts in student corpus	No. of words in student corpus	Number of target bundles	Percentage of total in prof. corpus	Percentage of TBs in corpus
PSY100 low	157	185 877	317	4.34%	0.68%
PSY100 high	158	216 600	553	7.58%	1.02%
PSY200 low	205	345 620	833	11.42%	0.96%
PSY200 high	207	414 269	1 408	19.30%	1.36%
PSY300 low	181	373 944	964	13.21%	1.03%
PSY300 high	199	491 937	1 845	25.28%	1.50%

Table 4.18: Target bundle frequencies in student corpora categorised according to academic year and academic performance

Column 1 presents the student groups according to academic year and academic performance, while column 2 provides the number of texts in each of the six student corpora. Column 3 presents the number of words in each student corpus which were used by the WST program in the identification of the lexical bundles listed as occurring in that corpus, while column 4 (*number of target bundles*) presents the frequencies based on the number of target bundles used by each group in their essays for that year. The figures in column 5 (*percentage of total in published corpus*) are based on the frequency count – calculated as a percentage of the number of target bundles that occur in the published corpus (7 297), taking all instances of the 118 types into account. The final column presents the percentage of target bundles in each student corpus, and as such is a measure of density. This is calculated as the frequency of bundles counted (column 4), multiplied by four (as there are four words in each bundle), and then divided by the number of words in that corpus. The frequency counts in this table reflect gradual increases in the use of target bundles according to both academic year and

performance, with the exception of the PSY200 high achievers whose use of target bundles showed a considerable increase and exceeded that of the low achievers in the third year.



Graph 4.1: Frequency of target bundles used by students grouped according to academic year and academic performance⁴⁰

Although the consistent increase is broken by the drop in frequency from the second-year high achievers to the third-year low achievers, these findings nevertheless support the bundles (density) and performance hypothesis as there is clearly a gradual increase in the use of bundles from the first-year to the third-year students in the group of low achievers, as well as a noticeably steeper increase in the number of target bundles used by the high achievers in the first-year, second-year and third-year groups. Closer analysis also shows that, while both groups more than triple their use of the target bundles from first year to third year (Table 4.18), there is far less increase overall for the low achievers as they start from a lower base, and have considerably less growth between second and third year than do the high achievers.

While the absolute numbers in Graph 4.1 give an indication of how often the various student groups use bundles, it must be recognised that the weaker students tend to produce shorter essays since they generally write less than the more proficient students. It is therefore necessary to consider density as well as frequency on the basis that density circumvents essay

⁴⁰ KEY to Graphs 4.1 and 4.2:

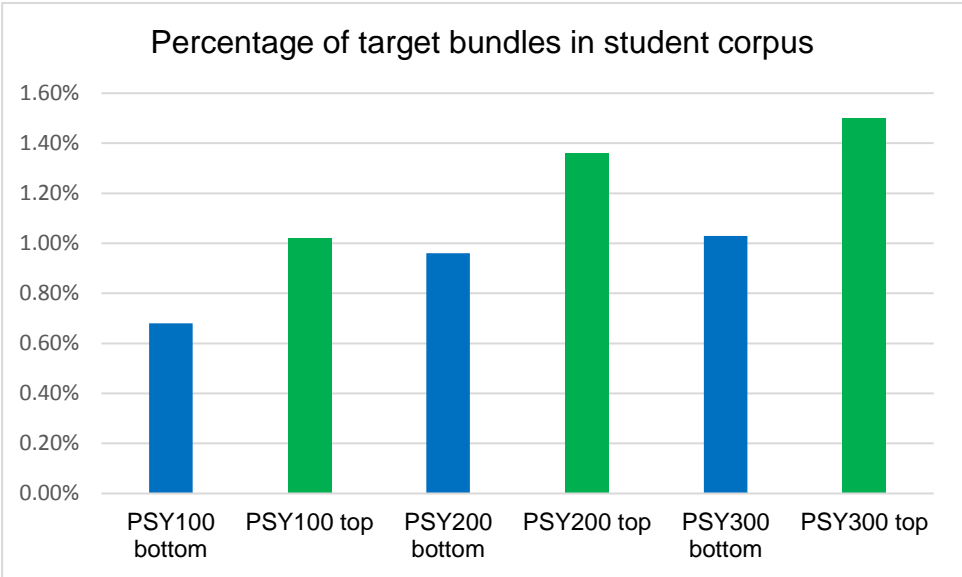
PSY100 / PSY200 / PSY300 bottom – bottom third of student academic performers in first-, second- and third-year groups, based on average essay results ('low achievers')

PSY100 / PSY200 / PSY300 top – top third of student academic performers in first-, second- and third-year groups, based on average essay results ('high achievers')

blue – bottom third of academic performers , green – top third of academic performers

length. Regardless of whether the essays are short or long, the lexical bundles are then compared on equal terms. Consideration of frequency and density therefore provides both absolute and relative perspectives.

Following from the above argument, further support for HLB1a is provided in the analysis of the percentage of target bundles used in each student corpus (i.e. the density). The pattern evident in Graph 4.2 follows a similar trend to that in the previous graph, illustrating a gradual increase in the density of target bundles used by the two groups in each academic year. Although the incremental scale is again broken, in this case by the drop from high achievers in the first and second years to low achievers in the second and third years, the steady increase in the density of target bundles used is clearly evident within each academic group if the low achievers and high achievers are considered separate groups.



Graph 4.2: Percentage of target bundles in each student corpus drawn up according to academic year and academic performance

The degree to which these differences between high and low achievers are significant was tested by means of the application of the log-likelihood test (§4.2.5.1), as presented in Table 4.19 below. The log-likelihood values indicate that the differences between the low and high groups are very significant, with the difference between these groups increasing steadily from first year to third year, and with the low group using significantly fewer target bundles in each case. These results provide yet further evidence in support of HLB1a as there is clearly a relationship between the proportion of target bundles used by students in their essay writing, and their academic performance on the basis of their essay results.

Performance-based student groups	Number of target bundles (TBs x4)	No. of words in corpus	Log-likelihood value (LL)*	Sig.
PSY100 low	317 (1 268)	185 877	33.81	$p < 0.0001$
PSY100 high	553 (2 212)	216 600		
PSY200 low	833 (3 332)	345 620	63.39	$p < 0.0001$
PSY200 high	1 408 (5 632)	414 269		
PSY300 low	964 (3 856)	373 944	92.07	$p < 0.0001$
PSY300 high	1 845 (7 380)	491 937		

- * Underuse in low corpus in all cases

Table 4.19: Log-likelihood comparison of target bundle frequencies between the low and high achievers in each academic year

While the difference in number of target bundles used by the low achievers in relation to the high achievers is relatively small in the first year, it has grown exponentially by the third year, with the high achievers having a far steeper growth curve in the number of target bundles incorporated into their essays. The relationship between students' use of target bundles and academic performance evident in these results supports the argument that competent use of bundles reflects a stronger degree of integration into the academic community (Cortes, 2004; Hyland, 2008b). This finding also begins to address the questions posed by Chen and Baker (2010:44) regarding the possibility of "a relationship between proficiency and the number of formulaic expressions used"; by Cortes (2006:401) of whether the appropriate use of lexical bundles contributes to perceptions of good writing; and, similarly, by Li and Schmitt (2009:98-99) as to whether "the appropriate and diverse use of lexical phrases [has] an effect on the evaluation of academic writing". While the latter's research showed no obvious connection between the student's use of lexical phrases and the evaluators' assessment of her writing, the relationship between use of bundles and performance in this study suggests that the appropriate use of bundles may play a role in the assessment of student writing.

This finding also contributes to the question of whether students acquire bundles naturally or require explicit teaching. Although the highest percentage of target bundles within the student corpora is only 25% (Table 4.18), both the low and high achievers have clearly acquired a greater range of bundles by the third year of their undergraduate studies. As these students did not receive explicit instruction in lexical bundles during their studies, it seems feasible to argue, in contrast to Byrd and Coxhead (2010), Cortes (2004) and Hernández (2013), that this increase in bundle usage has developed 'naturally' through exposure to the reading material as well as lectures and tutorials. While it must be recognised that the relatively small overlap

in the use of bundles by students and published writers is partially due to differences in genre, topic and context despite attempts to control for these variables (cf. §4.2.5.1), it is nevertheless worth noting that, even in their final year, the high achievers used only a small proportion of these target bundles (cf. Table 4.18). The fact that the students only used a limited number of bundles therefore seems to support the view that the high frequency target bundles not familiar to students should ideally be identified and explicitly taught in order to raise students' awareness of the way in which these bundles are used (Biber and Barbieri, 2007; Byrd and Coxhead, 2010; Cortes, 2004; Ellis et al., 2008). Issues relating to the teaching of bundles is discussed in more detail in Chapter 5.

The possibility of a relationship between the appropriateness of lexical bundle use and students' performance was explored in detail in the qualitative examination of lexical bundles. As 'appropriateness' is operationalised in terms of accuracy of usage in relation to the use by published writers (§3.6.2), investigation into this aspect required in-depth analysis of apparently non-standard as well as standard lexical bundles by means of concordance lines. The findings of this investigation are discussed in the qualitative results section (§4.3.5).

The next set of hypotheses to be considered follows from the assumption that there is a difference in the density and type of lexical bundles used by L1 and AL speakers.

4.3.2 Lexical bundles and language (HLB2)

HLB2 (Lexical bundles and language hypothesis)

First language students' use of lexical bundles will approximate that of published writers more closely than will that of additional language students.

In keeping with the parallelism that links the vocabulary and lexical bundle hypothesis framework, the main hypothesis in this case relates to language background. While the corresponding vocabulary hypothesis had a single operational hypothesis, in this case three hypotheses follow from the main one as lexical bundle use is assessed not only in terms of frequency of occurrence, but also in terms of functional and structural types. The first of these relates to the density of lexical bundle use.

4.3.2.1 Lexical bundles (density) and language (HLB2a)

HLB2a Lexical bundles (density) and language hypothesis:

There is less difference between the density of occurrence of target lexical bundles used by L1 students and published writers, than between the density of occurrence of target lexical bundles used by AL students and published writers.

The context of this hypothesis is that first language speakers are more likely than additional language speakers to have a degree of proficiency in the use of lexical bundles that is comparable to that of published writers. In order to test this assumption, the student corpus was separated into two sub-corpora on the basis of language, as for the parallel vocabulary hypothesis (§4.2.2.1). For the purposes of analysis, density was again operationalised in terms of proportional use of target bundles, based on the number of target bundles relative to the size of each corpus. The results of this analysis are presented in Table 4.20 below.

	No. of texts in corpus	No. of words in corpus	Number of target bundles	Percentage of total in prof. corpus	Percentage of TBs ⁴¹ in corpus
AL corpus	659	1 177 497	2 722	37.30%	0.92%
L1 corpus	1 015	1 895 247	5 460	74.83%	1.15%
Pub. corpus	280	1 809 866	7 297	100%	1.61%

Table 4.20: Target bundle frequencies in the AL, L1 and published corpora

As with the previous hypothesis relating to bundle density and performance (Table 4.18), the percentages in column 5 are based on the frequency counts in column 4, and represent the proportion of target bundles from the total in the published corpus (7297) which are used in the L1 and AL corpora. Column 3 again presents the number of words used by WST in the identification of lexical bundles, while column 6 provides the density of bundle use in each language corpus as a percentage.

As the group of additional language speakers is smaller ($n = 64$) than the group of first language speakers ($n = 96$), it is to be expected that there are fewer texts in the AL corpus than in the L1 corpus. This would account to some degree for the difference in the number of target bundles used by each group. However, the percentage of target bundles used in relation to each corpus provides a clear indication of the proportional differences in the number of target

⁴¹ Calculated as the number of LBs counted multiplied by four (4 words per bundle), divided by the number of words in the corpus

bundles used across the three groups, with the L1 students using more target bundles than the AL students. The degree of difference between the groups was again measured by means of the log-likelihood test (§4.3.1.1). The density of occurrence of target bundles was compared across the three groups by comparing each of the groups with one another: the L1 and AL student groups, the L1 group in relation to the published writers, and the AL student group relative to the published writers. The results of these comparisons are presented in Table 4.21 below, with the log-likelihood values provided as an indication of the degree of difference between the frequency counts in each case.

	Number of target bundles (x4)	No. of words in corpus	Log-likelihood value (LL)	Sig.
AL corpus	2 722 (10 888)	1 177 497	90.05	$p < 0.0001$
L1 corpus	5 460 (21 840)	1 895 247		
AL corpus	2 722 (10 888)	1 177 497	661.22	$p < 0.0001$
Pub. corpus	7 297 (29 188)	1 809 866		
L1 corpus	5 460 (21 840)	1 895 247	356.90	$p < 0.0001$
Pub. corpus	7 297 (29 188)	1 809 866		

Table 4.21: Log-likelihood comparison of target bundle frequencies between L1, AL and published corpora

While all three log-likelihood results are highly significant, the most considerable difference in the density of target bundles occurs between the AL and published corpora (LL = 661.22, $p < .0001$) in contrast to the far smaller difference between the L1 and published corpora (LL = 356.9, $p < .0001$). Although evidently of dissimilar frequencies, the smallest degree of difference is found between the two student corpora (LL = 90.05, $p < .0001$). While there is clearly a significant difference between the density of target bundles used by L1 students and published writers, nevertheless these results support the hypothesis that L1 students' use of lexical bundles corresponds more closely to that of published writers than does the AL students' use of bundles.

The finding that there is far less difference between student groups than between students and published writers corresponds with Chen and Baker's (2010) findings that published writers use the widest range of bundles while students use the smallest range, tending to overuse bundles not commonly found in published text. Cortes (2004:413) also found that target bundles which occurred frequently in academic prose "were never or rarely used by students at all levels". These findings differ from those of Hyland (2008a) and Allen (2009), both of whom

investigated postgraduate rather than undergraduate students. These discrepancies are discussed in more detail in the conclusion to the bundles-language hypothesis.

As with Chen and Baker (2010:39), the differences between student and published corpora in my study can be accounted for in terms of three factors: the published texts are edited by experienced writers before publication, the students are novice academic writers, and both L1 and AL writing are derived from a single corpus of psychology essays on the same range of topics. While both Chen and Baker (2010) and Ädel and Erman (2011) found L1 speakers to be more mature writers, the particular features that distinguish L1 and AL writing are investigated in HLB2b and HLB2c. Following from the analysis of density of bundle use by L1 and AL students in relation to published writers, the next step is to investigate possible differences in the use of bundles distinguished in terms of structural types.

4.3.2.2 Lexical bundles (structures) and language (HLB2b)

HLB2b Lexical bundles (structures) and language hypothesis:

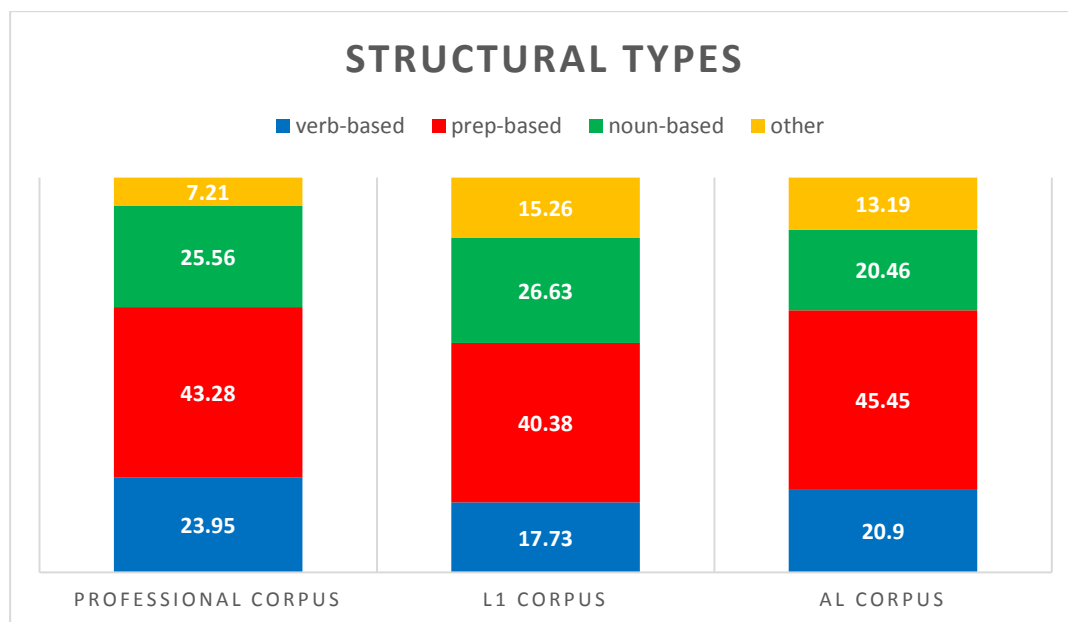
There are fewer differences in the structural types of target lexical bundles used by L1 students and published writers, than in the structural types of target lexical bundles used by AL students and published writers.

The context of this hypothesis is that first-language students are more likely to use the structural bundles which occur in the published corpus than are additional language students. The basis of this assumption is that first-language students may generally be expected to have a higher proficiency level with regard to academic writing, and so, by extension, many of the features typical of published academic writing. This hypothesis was tested by means of both descriptive statistics in analysing frequencies and percentages, and inferential statistics in applying the chi-square technique.

The analysis of lexical bundles in terms of structural and functional types was applied initially in Biber et al.'s (1999) study, and subsequently in studies by Biber et al. (2004), Cortes (2004) and Hyland (2008), as described in Chapter 2 (§2.3.1). While the focus of this investigation is on differences in the use of structural types by L1 and AL students in relation to published writers, the next hypothesis (§4.3.2.3) considers the use of functional types by these groups.

For the purposes of analysis, the structural types of the target bundles in the published corpus were categorised according to their primary grammatical features, as described in Chapter 3 (§3.5.2.3b). This categorisation of the target bundles in the published corpus is presented in

Appendix T. The density of each structural type was then calculated for the L1 and AL corpora. The results of the analysis of each broad category of structural types are presented in Graph 4.3 below, with the detailed frequencies of each sub-category within the broader grammatical framework presented in Table 4.22.



Graph 4.3⁴²: Representation of the overall distribution of structural types across the published, L1 and AL corpora

A superficial examination of this graph suggests that the most distinctive difference occurs in the greater use of ‘other’ bundles by both L1 and AL students. This observation is supported by the figures in Table 4.22 as these seem to reflect little real difference in the use of the structural types across the three corpora, with the exception of the general category ‘other’. However, it should be noted that, in the case of the verb-based and preposition-based bundles, the percentages in the AL corpus appear closer to those in the published corpus than do those in the L1 corpus, an observation that runs counter to the hypothesis being tested.

⁴² KEY to Graph 4.3:

Structural types of target bundles: **blue** – verb-based; **red** – preposition-based; **green** – noun-based; **yellow** – other;

Pub. – published writers; L1 – first-language students; AL – additional language students

	Structural types	Frequency and relative proportion - Pub. corpus	Frequency and relative proportion - L1 corpus	Frequency and relative proportion - AL corpus
VERB BASED	Verb phrase + <i>to</i> -clause fragment	867 (11.88%)	456 (8.35%)	298 (10.95%)
	(Passive) VP + prep phrase (fragment)	273 (3.74%)	0 (0%)	0 (0%)
	(Passive) VP + noun phrase	45 (0.62%)	140 (2.56%)	109 (4.00%)
	Anticipatory <i>it</i> + VP + <i>to</i> -clause (fragment)	276 (3.78%)	258 (4.73%)	104 (3.82%)
	Anticipatory <i>it</i> + VP (adj.) + complementizer	201 (2.75%)	114 (2.09%)	58 (2.13%)
	Anticipatory <i>it</i> + VP	86 (1.18%)	0 (0%)	0 (0%)
	TOTALS – verb based bundles	1 748 (23.95%)	968 (17.73%)	569 (20.90%)
PREPOSITION BASED	Prepositional phrase	773 (10.59%)	425 (7.78%)	390 (14.33%)
	Prepositional phrase + <i>of</i>	2 198 (30.12%)	1 478 (27.07%)	800 (29.39%)
	Prepositional phrase + complementizer	187 (2.56%)	302 (5.53%)	47 (1.73%)
	TOTALS – prep based bundles	3 158 (43.28%)	2 205 (40.38%)	1 237 (45.45%)
NOUN BASED	Noun phrase + post-nominal clause (fragment)	451 (6.18%)	615 (11.26%)	237 (8.71%)
	Noun phrase + <i>of</i>	1 079 (14.79%)	471 (8.63%)	183 (6.72%)
	Noun phrase + prep. phrase (fragment)	105 (1.44%)	121 (2.21%)	64 (2.35%)
	Noun (phrase) + (passive) VP	139 (1.90%)	144 (2.64%)	0 (0%)
	Noun phrase + complementizer	91 (1.25%)	103 (1.89%)	73 (2.68%)
	TOTALS – noun based bundles	1 865 (25.56%)	1 454 (26.63%)	557 (20.46%)
OTHER	Adverbial phrase	185 (2.54%)	497 (9.10%)	188 (6.91%)
	Adjectival phrase	151 (2.07%)	178 (3.26%)	85 (3.12%)
	<i>That</i> -clause fragment	79 (1.08%)	158 (2.09%)	86 (3.16%)
	Conjunction + NP	37 (0.51%)	0 (0%)	0 (0%)
	Modal + VP	37 (0.51%)	0 (0%)	0 (0%)
	Dummy subject + VP	37 (0.51%)	0 (0%)	0 (0%)
	TOTALS - other	526 (7.21%)	833 (15.26%)	359 (13.19%)
OVERALL TOTALS		7 297 (100%)	5 460 (100%)	2 722 (100%)

Table 4.22: Density of structural types in the published, L1 and AL corpora

As any conclusions made on the basis of these descriptive statistics would be tentative, it is necessary to consider the differences in terms of inferential statistics by means of the chi-square test. The Pearson chi-square test (X^2) was used to assess whether there are any

significant differences in the distribution of structural bundle types across the three corpora. This application is modelled on Chen and Baker’s study (2010:38-39), in which this statistical measure was employed to determine degrees of difference in the distribution of functional types. The chi-square procedure is a non-parametric test applied to categorical or nominal data, and determines whether the variables under investigation are significantly related (Dörnyei, 2007:227-228).

In order to gain a clear idea of the differences in use between the main categories of structural types, chi-square was applied only to the broader categories: verb-based, preposition-based, noun-based and ‘other’. The results are presented in Table 4.23 below.

$\chi^2 (6) = 293.759^a, p < .001, n = 15\,479$			Corpora		
			AL	L1	Pub.
Structural types	verb	Count	569	968	1748
		Expected Count	577.7	1158.7	1548.6
		Std. Residual	-.4	-5.6	5.1
	prep	Count	1237	2205	3158
		Expected Count	1160.6	2328.1	3111.3
		Std. Residual	2.2	-2.6	.8
	noun	Count	557	1454	1865
		Expected Count	681.6	1367.2	1827.2
		Std. Residual	-4.8	2.3	.9
	other	Count	359	833	526
		Expected Count	302.1	606.0	809.9
		Std. Residual	3.3	9.2	-10.0

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 302.11.

Table 4.23: Standardised residuals in a chi-square contingency table for the distribution of structural types across the AL, L1 and published corpora

This chi-square test indicates a significant difference among the three corpora. The standardised residuals (R), which compare observed and expected counts, serve to identify those cells which make “a major contribution to the significant difference” (Chen and Baker, 2010:38). In other words, the comparison of observed and expected counts in that particular case indicates that the groups being compared are significantly different. This applies only to those cells with a value of R greater than ± 1.96 , as indicated in bold and highlighted. The results in Table 4.23 serve to reinforce the initial observation that the greatest difference occurs in the ‘other’ category as the published writers use significantly fewer of the grammatical forms

identified under this general category. This is evident in the difference in percentages listed in Table 4.22, and is further supported by a secondary chi-square test conducted specifically on the grammatical structures within the 'other' category. The results of this secondary test are presented in Table 4.24 below.

$\chi^2 (10) = 306.331^a, p < .001, n = 1718$			Corpora		
			AL	L1	Pub.
Structural types ⁴³ adj	Count	85	178	151	
	Expected Count	86.5	200.7	126.8	
	Std. Residual	-.2	-1.6	2.2	
adv	Count	188	497	185	
	Expected Count	181.8	421.8	266.4	
	Std. Residual	.5	3.7	-5.0	
conj	Count	0	0	37	
	Expected Count	7.7	17.9	11.3	
	Std. Residual	-2.8	-4.2	7.6	
modal	Count	0	0	37	
	Expected Count	7.7	17.9	11.3	
	Std. Residual	-2.8	-4.2	7.6	
subj	Count	0	0	37	
	Expected Count	7.7	17.9	11.3	
	Std. Residual	-2.8	-4.2	7.6	
that	Count	86	158	79	
	Expected Count	67.5	156.6	98.9	
	Std. Residual	2.3	.1	-2.0	

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.73.

Table 4.24: Standardised residuals in a chi-square contingency table for the distribution of structural types categorised as 'other' across the AL, L1 and published corpora

Although Table 4.23 illustrates that published writers use fewer structural types from the 'other' category overall in relation to the L1 and AL students, their use of the sub-categories within this type is more varied. As can be seen from Table 4.24, while published writers use considerably fewer *that*-clause fragments (*that there is a*) and adverbial phrases (*as well as the*) – the latter particularly in relation to the L1 students, they use significantly more grammatical structures that have a conjunction, modal or dummy subject at their head (*and*

⁴³ KEY to structural types: adj – adjectival phrase; adv – adverbial phrase; conj – conjunction + NP; modal – modal + VP; subj – dummy subject + VP; that – *that*-clause fragment

the number of, should be noted that, there is evidence that)⁴⁴ as well as adjectival phrases (*more likely to be*) (Appendices S, T and U). This difference is particularly marked between first-language students and published writers, although this is largely accounted for by the size of the L1 corpus in relation to the size of the AL corpus.

It is possible to draw further conclusions from the overall results in Table 4.23. On the one hand, there are significantly fewer verb-based and preposition-based bundles in the L1 corpus, with significantly fewer noun-based bundles in the writing of the additional language students. In contrast to this, the L1 students tend to use more noun-based bundles, with the AL students using more preposition-based bundles. The published writers, on the other hand, use significantly more verb-based bundles, particularly in contrast to the L1 students. Although this finding runs counter to that of Chen and Baker (2010) who found a predominance of VP-based bundles in student writing, and a high proportion of NP-bundles and referential markers in published writing, it reflects the frequent use of bundles such as *is consistent with the, to be associated with, it is important/necessary to, are more likely to* and *has been shown to* in published writing, all of which are typical of academic prose as they establish inferential and causative relations. The predominance of noun-based bundles in the L1 corpus and preposition-based bundles in the AL corpus may be accounted for by the extremely frequent use of noun phrases such as *the way in which, one of the most* and *the fact that the*, and prepositional phrases such as *on the other hand, as a result of* and *in the case of* in the student corpus, many of which seem to serve a descriptive function.

While there is no evidence from these results of any difference between L1 and AL speakers in their use of bundles such as “unattended ‘this’ and existential ‘there’” (Ädel and Erman, 2011:86), further evidence of the differences in the use of structural types by published and student writers is found in the analysis of keyness and concordance lines conducted for the qualitative study (§4.3.5). Discrepancies in bundle use by L1 and AL speakers are also examined in depth to establish whether L1 students are more familiar with the types of bundles Ädel and Erman (2011) regard as indicative of more mature writing.

The results of this quantitative analysis provide no support for the hypothesis that the L1 students’ use of structural types approximates that of published writers more closely than does AL students’ use of these types of bundles. This finding ties in with Chen and Baker’s (2010:44) conclusion that “the use of lexical bundles in non-native and native student essays is surprisingly similar”. The aim of the qualitative study is therefore to provide a deeper

⁴⁴ While each structural type only occurs once in the published corpus, all three have a frequency of 37 (Appendix S)

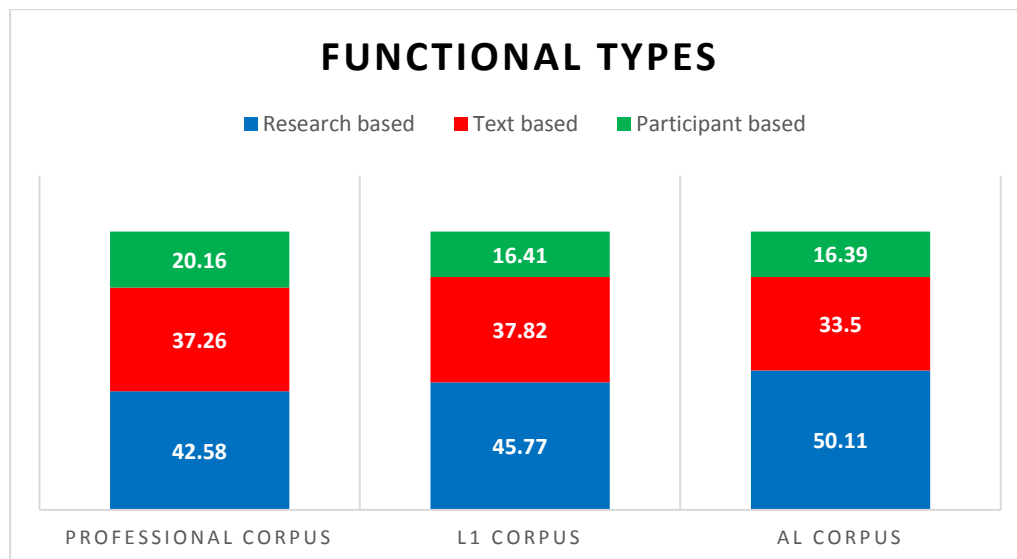
investigation into bundle differences on the basis of language background. In the next section, distinctions in the use of various functional types of bundles by both published and student writers are considered.

4.3.2.3 Lexical bundles (functions) and language (HLB2c)

HLB2c Lexical bundles (functions) and language hypothesis:

There are fewer differences in the functional types of target lexical bundles used by L1 students and published writers, than in the functional types of target lexical bundles used by AL students and published writers.

This hypothesis follows the pattern of the previous one in assuming that the L1 students are more likely than the additional language students to use the functional types in ways similar to those used by the published writers. The first step in the analysis was to categorise the target bundles according to functional type. The classification framework used for this process was based on the taxonomy set out by Hyland (2008a), as described in Chapter 3 (§3.5.2.3b). The functional type of each target bundle is provided in Appendix T. The initial broad categorisation of functional types is presented in Graph 4.4 below.



Graph 4.4: Representation of the overall distribution of functional types across the published, L1 and AL corpora

This graph clearly illustrates that, while the density of the participant-based bundles appears almost identical in the L1 and AL corpora, the L1 students' use of the text-based and research-based bundles seems more aligned with that of the published writers. Following the classification of bundles into functional types, an analysis was conducted in which the

frequency and relative proportion of each type was calculated across the three corpora, as indicated in Table 4.25.

	Functional types	Frequency and relative proportion - Pub. corpus	Frequency and relative proportion - L1 corpus	Frequency and relative proportion - AL corpus
RESEARCH BASED	Location	612 (8.39%)	488 (8.94%)	301 (11.06%)
	Procedure	377 (5.17%)	752 (13.77%)	390 (14.33%)
	Quantification	979 (13.41%)	350 (6.41%)	207 (7.61%)
	Description	1 139 (15.61%)	909 (16.65%)	466 (17.12%)
	TOTALS – research based bundles	3 107 (42.58%)	2 499 (45.77%)	1 364 (50.11%)
TEXT BASED	Transition	502 (6.88%)	730 (13.37%)	421 (15.47%)
	Resultative	720 (9.87%)	663 (12.14%)	201 (7.38%)
	Framing	1 497 (20.51%)	672 (12.31%)	290 (10.65%)
	TOTALS – text based bundles	2 719 (37.26%)	2 065 (37.82%)	912 (33.50%)
PARTICIPANT BASED	Stance	1 342 (18.39%)	794 (14.54%)	404 (14.84%)
	Engagement	129 (1.77%)	102 (1.87%)	42 (1.54%)
	TOTALS – participant based bundles	1 471 (20.16%)	896 (16.41%)	446 (16.39%)
OVERALL TOTALS		7 297 (100%)	5 460 (100%)	2 722 (100%)

Table 4.25: Frequency and relative proportion of functional types in the published, L1 and AL student corpora

In the case of the research-based and text-based bundles, this table seems to reflect greater similarity between the use of functional types by the L1 students and published writers than was evident in the case of the structural types. As in the case of the structural types, Pearson chi-square tests were conducted to determine significant differences in these findings. The results of the chi-square tests are set out in Table 4.26.

$\chi^2 (4) = 65.959^a, p < .001, n = 15\,479$			Corpora		
			AL	L1	Pub.
Functional types ⁴⁵ Part.- based	Count	446	896	1471	
	Expected Count	494.7	992.2	1326.1	
	Std. Residual	-2.2	-3.1	4.0	
Res.- based	Count	1364	2499	3107	
	Expected Count	1225.7	2458.6	3285.7	
	Std. Residual	4.0	.8	-3.1	
Text- based	Count	912	2065	2719	
	Expected Count	1001.6	2009.2	2685.2	
	Std. Residual	-2.8	1.2	.7	

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 494.67.

Table 4.26: Standardised residuals in a chi-square contingency table for the distribution of functional types across the AL, L1 and published corpora

This chi-square test indicates a significant difference among the three corpora. Those cells with an *R* value that exceeds ± 1.96 have been highlighted to indicate which of the functional types have contributed most to the significant difference. One of the most marked set of results is for the participant-based bundles as the published writers clearly use significantly more stance-based bundles in particular, as evident from the comparative percentages in Table 4.25, while both student groups used considerably fewer participant-based bundles, with the L1 students using this type of bundle least frequently. This result ties in with that of Hyland (2008b), who found that participant bundles occurred predominantly in research articles, with relatively few occurrences in student writing. On the basis of this finding, Hyland (2008b:19) argues that “the relative absence of their use in the student corpora suggests that these writers may be uncomfortable in explicitly aligning themselves with a particular evaluation”. This relates to students’ use of hedging devices, an issue which is examined in more detail in the qualitative analysis (§4.3.5).

The results in Table 4.26 also reflect a significantly greater use of research-based bundles within the AL corpus, with the published writers using significantly fewer of this type than either of the student groups. In addition, the AL students also use considerably fewer text-based bundles than either the L1 student group or the published writers. This finding contrasts with that of both Chen and Baker (2010) and Nekrasova (2009), who found that students knew more text-oriented or ‘discourse-organising’ than research-oriented or ‘referential’ bundles. On

⁴⁵ KEY to functional types: Part.-based – Participle-based bundles; Res.-based – Research based bundles; Text-based – Text-based bundles

the basis of her finding, Nekrasova concluded that text-oriented bundles are more easily recognised than referential bundles as they play a more salient role:

[D]iscourse-organizing bundles operate on a higher level – they are used to indicate the connections between larger pieces of discourse. Referential bundles, on the other hand, function on a lower, phrasal or sentence, level and provide additional information to characterize one of the sentence constituents.

(Nekrasova, 2006:673)

A possible alternative explanation which could account for the AL student's underuse of text-oriented bundles in relation to the published corpus is that they may be using conjunctions and adverbial phrases to express the meanings conveyed by text-oriented bundles, as was found by Cortes (2006:399). This possibility was reinforced in the interviews as two of the low achievers confused lexical bundles with adverbs such as *moreover* (§4.3.6.3).

It may be concluded from the observations drawn from my results that, of the three groups, the AL students differ most in their use of the functional types. It may therefore be argued that the L1 students' use of functional types is generally more similar to that of the published writers when compared to that of the AL group. Although in the case of both participant-based and research-based bundles, the published writers differ considerably from both student groups, the fact that the differences in the use of research- and text-oriented bundles are noticeably less in relation to the L1 group than in relation to the AL group indicates that there is some support for the supposition tested here.

As mentioned previously, the markedly frequent use of specific stance bundles by the published writers and particular research-based bundles by the AL students will be explored in more detail in the course of the qualitative study (§4.3.5). The next section presents a series of hypotheses that run parallel to the three investigated in this section (§4.3.2), although the focus is on the distinctions in the use of target bundles by students in different academic years, that is, first year as opposed to third year, rather than language background.

4.3.3 Lexical bundles and academic year (HLB3)

HLB3 (Lexical bundles and academic year hypothesis)

Third-year students' use of lexical bundles will approximate that of published writers more closely than will that of first-year students.

This hypothesis aims to explore the relationship between the use of lexical bundles by first-year students, and by the same cohort of students in their third year of study, with the lexical bundles used by published writers serving as a benchmark in each case. In line with bundles and language hypothesis, the first of the working hypotheses focuses on the density of target bundle use, as expressed below.

4.3.3.1 Lexical bundles (density) and academic year (HLB3a)

HLB3a Lexical bundles (density) and academic year hypothesis:

There is less difference between the density of occurrence of target lexical bundles used by third-year students and published writers, than between the density of occurrence of target lexical bundles used by first-year students and published writers.

The context of this hypothesis is that there is a gradual improvement in students' writing as they move from the first year to the third year of their undergraduate degree. This was measured by calculating the density of the target bundles in the first-year and third-year corpora, and comparing these densities to bundles in the published corpus, as presented in Table 4.27.

	No. of texts in corpus	No. of words in corpus	Number of target bundles	Percentage of total in prof. corpus	Percentage of TBs in corpus
PSY100 corpus	471	600 411	1 166	15.98%	0.78%
PSY300 corpus	584	1 340 449	3 986	54.63%	1.19%
Pub. corpus	280	1 809 866	7 297	100%	1.61%

Table 4.27: Target bundle frequencies in the PSY100, PSY300 and published corpora

As in the parallel hypothesis (HLB2a, §4.3.2.1), the percentage of target bundles (column 6) is based on the number of target bundles multiplied by four, and then divided by the number of words in the corpus. The number of target bundles in each corpus (column 4) clearly reveals a fairly sharp increase in the density of bundles used by third-year students in relation to those used by first years, indicating that the students' writing contains considerably more of the target

bundles in their third-year essays. The degree of significance in the differences between the two student groups and the published writers was measured by means of log-likelihood tests, the results of which are presented in Table 4.28.

	Frequency of TBs	No. of words in corpus	Log-likelihood value	Sig.
PSY100 corpus	1 166	600 411	176.23	$p < 0.0001$
PSY300 corpus	3 986	1 340 449		
PSY100 corpus	1 166	600 411	636.49	$p < 0.0001$
Pub. corpus	7 297	1 809 866		
PSY300 corpus	3 986	1 340 449	245.28	$p < 0.0001$
Pub. corpus	7 297	1 809 866		

Table 4.28: Log-likelihood comparison of target bundle frequencies between PSY100, PSY300 and published corpora

The results in Table 4.28 reflect that, while there are highly significant differences between the first-year and third-year corpora in terms of the density of target bundles incorporated into the essays, and an even greater difference between the third-year corpus and the published corpus, the greatest difference lies in the frequency of bundle use by first-year students as opposed to published writers. This finding serves to support the hypothesis that, in relation to published writers, third-year students would more closely approximate the number of bundles used than would the first-year students, suggesting that students' ability to incorporate lexical bundles appropriately into their writing develops to some extent as they progress through their undergraduate studies. This links to Li and Schmitt's (2009:97) conclusion that "formulaic language is learnt incrementally", and to Crossley and Salsbury's (2011) finding that students' ability to produce accurate bigrams developed over the course of a year, from which they concluded that lexical bundle accuracy increases with the development of more general language competence. Cortes' (2004) question of whether students' are less inclined to overgeneralise the use of bundles as they progress from lower to upper academic levels is considered in the course of the qualitative study (§4.3.5).

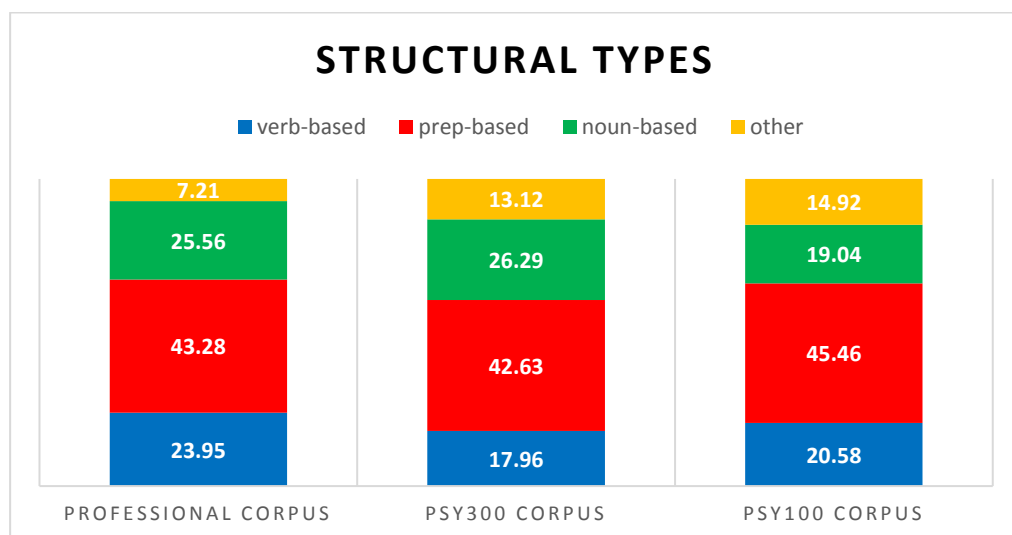
As with the investigation into the use of the target bundles by first-language and additional language students, the next hypothesis to be considered relates to the use of particular structural types of bundles by the first-year and third-year students.

4.3.3.2 Lexical bundles (structures) and academic year (HLB3b)

HLB3b Lexical bundles (structures) and academic year hypothesis:

There are fewer differences in the structural types of target lexical bundles used by third-year students and published writers, than in the structural types of target lexical bundles used by first-year students and published writers.

The context of this hypothesis is that students should gradually improve their language skills over the course of their undergraduate degree as they are exposed to increasing amounts of prescribed reading material, both textbooks and journal articles, which serves as a model for academic writing. In addition to the increases in reading material, the undergraduates are of course also required to write longer essays each year – approximately 1000 words in first year, 1500 in second year and 3000 in third year. The students should therefore develop a range of both receptive and productive vocabulary specific to their field of study, including high-level and academic vocabulary items (§4.2.3.1) as well as lexical bundles. As in the case of the parallel hypothesis relating to the distinction between structural types used by L1 and AL student groups (§4.3.2.2), this hypothesis was tested through a comparison of densities as well as the application of chi-square. The results of the analysis of each broad category of structural types are presented in Graph 4.5 below, with the detailed frequencies of each sub-category presented in Table 4.29.



Graph 4.5: Representation of the overall distribution of structural types across the published, PSY300 and PSY100 corpora

This graph clearly illustrates the patterns of use of the different structural types. Initial scrutiny of these results suggests that the third-year students used fewer verb-based target bundles than the published writers, while the first years used fewer noun-based bundles. As in the case

of the hypothesis regarding bundle structures and language background, the published writers seem to use far fewer bundles in the 'other' category than either the third-year or first-year groups. There is little apparent variation among the three groups in the use of preposition-based bundles.

	Structural types	Frequency and relative proportion - Pub. corpus	Frequency and relative proportion - PSY300 corpus	Frequency and relative proportion - PSY100 corpus
VERB BASED	Verb phrase + <i>to</i> -clause fragment	867 (11.88%)	302 (7.58%)	121 (10.38%)
	(Passive) VP + prep phrase (fragment)	273 (3.74%)	0 (0%)	0 (0%)
	(Passive) VP + noun phrase	45 (0.62%)	106 (2.66%)	58 (4.97%)
	Anticipatory <i>it</i> + VP + <i>to</i> -clause (fragment)	276 (3.78%)	229 (5.75%)	32 (2.74%)
	Anticipatory <i>it</i> + VP (adj.) + complementizer	201 (2.75%)	79 (1.98%)	29 (2.49%)
	Anticipatory <i>it</i> + VP	86 (1.18%)	0 (0%)	0 (0%)
	TOTALS – verb based bundles	1 748 (23.95%)	716 (17.96%)	240 (20.58%)
PREPOSITION BASED	Prepositional phrase	773 (10.59%)	480 (12.04%)	91 (7.81%)
	Prepositional phrase + <i>of</i>	2 198 (30.12%)	937 (23.51%)	385 (33.02%)
	Prepositional phrase + complementizer	187 (2.56%)	282 (7.07%)	54 (4.63%)
	TOTALS – prep based bundles	3 158 (43.28%)	1 699 (42.63%)	530 (45.46%)
NOUN BASED	Noun phrase + post-nominal clause (fragment)	451 (6.18%)	472 (11.84%)	94 (8.06%)
	Noun phrase + <i>of</i>	1 079 (14.79%)	349 (8.76%)	38 (3.26%)
	Noun phrase + prep. phrase (fragment)	105 (1.44%)	66 (1.65%)	53 (4.55%)
	Noun (phrase) + (passive) VP	139 (1.90%)	80 (2.01%)	0 (0%)
	Noun phrase + complementizer	91 (1.25%)	81 (2.03%)	37 (3.17%)
	TOTALS – noun based bundles	1 865 (25.56%)	1 048 (26.29%)	222 (19.04%)
OTHER	Adverbial phrase	185 (2.54%)	323 (8.10%)	148 (12.69%)
	Adjectival phrase	151 (2.07%)	67 (1.68%)	0 (0%)
	<i>That</i> -clause fragment	79 (1.08%)	133 (3.34%)	26 (2.23%)
	Conjunction + NP	37 (0.51%)	0 (0%)	0 (0%)
	Modal + VP	37 (0.51%)	0 (0%)	0 (0%)
	Dummy subject + VP	37 (0.51%)	0 (0%)	0 (0%)
	TOTALS - other	526 (7.21%)	523 (13.12%)	174 (14.92%)
OVERALL TOTALS	7 297 (100%)	3 986 (100%)	1 166 (100%)	

Table 4.29: Frequencies and relative proportions of structural types in the published, PSY300 and PSY100 corpora

The observations drawn on the basis of these results in Table 4.29 are empirically tested by the application of a Pearson chi-square test, as illustrated below. The results of this chi-square test indicate a significant difference among the three corpora ($X^2(6) = 190.654$,

$p < .001$). The findings support the earlier observation that there is little difference between the three groups in their use of preposition-based bundles, and no significant difference between the PSY300 and the published corpora in the use of noun-based bundles. However, it is clear that there is a considerable difference between the third-year students and published writers in their use of verb-based bundles as the published writers use significantly more than either of the student groups. In this regard, the use of verb-based structural types by third-years follows a very similar pattern to that of the first-language students in relation to the published writers (§4.3.2.2, Table 4.23).

$\chi^2 (6) = 190.654^a, p < .001, n = 12\,449$			Corpora		
			PSY100	PSY300	Pub.
Structural types	verb	Count	240	716	1748
		Expected Count	253.3	865.8	1585.0
		Std. Residual	-.8	-5.1	4.1
	prep	Count	530	1699	3158
		Expected Count	504.6	1724.8	3157.6
		Std. Residual	1.1	-.6	.0
	noun	Count	222	1048	1865
		Expected Count	293.6	1003.8	1837.6
		Std. Residual	-4.2	1.4	.6
	other	Count	174	523	526
		Expected Count	114.5	391.6	716.9
		Std. Residual	5.6	6.6	-7.1

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 114.55.

Table 4.30: Standardised residuals in a chi-square contingency table for the distribution of structural types across the PSY100, PSY300 and published corpora

As in the case of the findings on the AL and L1 students' use of structural types, in which the additional language students used fewer noun-based bundles than occurred in the first-language or published corpora (§4.3.2.2, Table 4.23), the first-year students used significantly fewer noun-based bundles than either the third years or the published writers. Following from the argument by Biber et al. (2004:398) that "noun phrases and prepositional phrases are the primary grammatical devices used for referential functions", and from the finding by Biber and Barbieri (2007:282) that "referential functions are the dominant use of lexical bundles in the written university registers", this difference suggests that third-year students may be more closely approximating the academic prose typical of academic journals, even if only to a small degree. Finally, it should also be noted that the results of the 'other' category correspond closely to those in the hypothesis regarding bundle structures and language origin in that, while

the first-year and third-year students used considerably more examples of this structural type overall, the published writers used significantly fewer. However, closer examination shows that the published writers use a greater variety of structural types within this category. These variations are again investigated by means of a further chi-square test.

$\chi^2 (10) = 309.055^a, p < .001, n = 1223$			Corpora		
			PSY100	PSY300	Pub.
Structural types ⁴⁶	adj	Count	0	67	151
		Expected Count	31.0	93.2	93.8
		Std. Residual	-5.6	-2.7	5.9
adv	Count	148	323	185	
	Expected Count	93.3	280.5	282.1	
	Std. Residual	5.7	2.5	-5.8	
conj	Count	0	0	37	
	Expected Count	5.3	15.8	15.9	
	Std. Residual	-2.3	-4.0	5.3	
modal	Count	0	0	37	
	Expected Count	5.3	15.8	15.9	
	Std. Residual	-2.3	-4.0	5.3	
subj	Count	0	0	37	
	Expected Count	5.3	15.8	15.9	
	Std. Residual	-2.3	-4.0	5.3	
that	Count	26	133	79	
	Expected Count	33.9	101.8	102.4	
	Std. Residual	-1.4	3.1	-2.3	

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.26.

Table 4.31: Standardised residuals in a chi-square contingency table for the distribution of structural types categorised as 'other' across the PSY100, PSY300 and published corpora

It is clear from the more detailed chi-square results given in Table 4.31 that, in the majority of cases, the published writers in fact use significantly more of these structural types than do the two groups of students. As in the case of the bundles (structures) and language hypothesis (§4.3.2.2), the exceptions are in the case of adverbial phrases (e.g. *as well as the*), and *that*-clause fragments (e.g. *that there is a*), with the adverbial phrases in particular being used considerably more frequently than by the students. Furthermore, it should be noted that the discrepancies in frequency between the PSY100 students and the published writers with

⁴⁶ KEY to structural types: adj – adjectival phrase; adv – adverbial phrase; conj – conjunction + NP; modal – modal + VP; subj – dummy subject + VP; that – *that*-clause fragment

regard to the use of adjectival and adverbial phrases are far more marked than between the PSY300 students and the published writers. However, in the case of the structural types headed by a conjunction (*and the number of*), modal (*should be noted that*), dummy subject (*there is evidence that*) and demonstrative (*that there is a*), the differences between the PSY300 students and the published writers are far more extreme than between the PSY100 group and the published writers.

As with the hypothesis regarding structural types and language background, there is no support for this hypothesis as there is no clear evidence that the use of structural types by third-year students is more closely aligned to that of the published writers.

The last hypothesis in this section runs parallel to the functional types/language background hypothesis, and examines the use of different functional types by the first-year and third-year students in relation to the published writers.

4.3.3.3 Lexical bundles (functions) and academic year (HLB3c)

HLB3c Lexical bundles (functions) and academic year hypothesis:

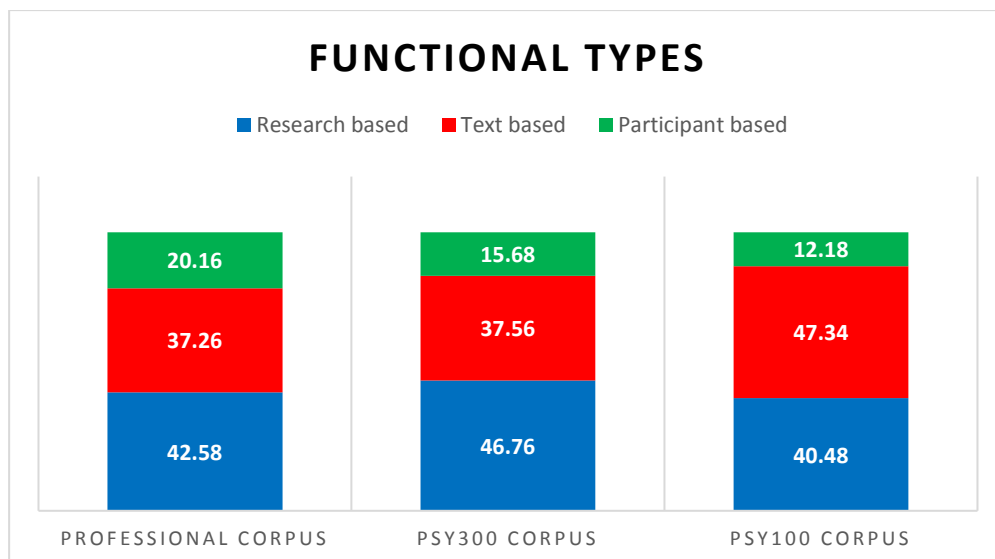
There are fewer differences in the functional types of target lexical bundles used by third-year students and published writers, than in the functional types of target lexical bundles used by first-year students and published writers.

This hypothesis is again based on the view that undergraduate students may be expected to develop their level of academic language proficiency gradually over the course of their studies. This should therefore be reflected in evidence of progress such as students' ability to successfully apply vocabulary typical of academic texts to their own writing. A measure of such ability should be apparent in the third-year students' improved grasp of those lexical bundles that occur with particular frequency in the journal articles which are relevant to their essay topics. As with the parallel hypothesis regarding functional types and language background (§4.3.2.3), the density of target bundles in each corpus was analysed in order to identify those functional types used by the first-year and third-year students in relation to the published writers. The results are provided in Table 4.32 below, with both frequencies and percentages listed to indicate the proportion of occurrence relative to the total number of bundles.

	Functional types	Frequency and relative proportion - Published corpus	Frequency and relative proportion - PSY300 corpus	Frequency and relative proportion - PSY100 corpus
RESEARCH BASED	Location	612 (8.39%)	383 (9.61%)	72 (6.17%)
	Procedure	377 (5.17%)	587 (14.73%)	135 (11.58%)
	Quantification	979 (13.41%)	355 (8.91%)	111 (9.52%)
	Description	1 139 (15.61%)	539 (13.52%)	154 (13.21%)
	TOTALS – research based bundles	3 107 (42.58%)	1 864 (46.76%)	472 (40.48%)
TEXT BASED	Transition	502 (6.88%)	527 (13.22%)	239 (20.50%)
	Resultative	720 (9.87%)	396 (9.93%)	141 (12.09%)
	Framing	1 497 (20.51%)	574 (14.40%)	172 (14.75%)
	TOTALS – text based bundles	2 719 (37.26%)	1 497 (37.56%)	552 (47.34%)
PARTICIPANT BASED	Stance	1 342 (18.39%)	558 (14.00%)	142 (12.18%)
	Engagement	129 (1.77%)	67 (1.68%)	0 (0%)
	TOTALS – participant based bundles	1 471 (20.16%)	625 (15.68%)	142 (12.18%)
OVERALL TOTALS		7 297 (100%)	3 986 (100%)	1 166 (100%)

Table 4.32: Density of functional types in the published corpus, PSY300 student corpus and PSY100 student corpus

The differences in percentages among the three groups in this table suggest that the third-year students tend to use a greater proportion of research-based bundles than either the first years or the published writers, while the first years use the highest proportion of text-based bundles and the published writers use the most participant-based bundles. These proportions are reflected in the graph below, illustrating the distribution of functional types across the first-year, third-year and published corpora.



Graph 4.6: Representation of the overall distribution of functional types across the published, PSY300 and PSY100 corpora

Again, the degree to which these differences in the use of functional types may be regarded as significant was tested by the application of the Pearson chi-square test. The results of this test are presented in Table 4.33.

$\chi^2 (4) = 93.765^a, p < .001, n = 12\ 449$			Corpora		
			PSY100	PSY300	Pub.
Functional types	Part.- based	Count	142	625	1471
		Expected Count	209.6	716.6	1311.8
		Std. Residual	-4.7	-3.4	4.4
Res.- based	Res.- based	Count	472	1864	3107
		Expected Count	509.8	1742.8	3190.4
		Std. Residual	-1.7	2.9	-1.5
Text- based	Text- based	Count	552	1497	2719
		Expected Count	446.6	1526.6	2794.8
		Std. Residual	5.0	-0.8	-1.4

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 209.62.

Table 4.33: Standardised residuals in a chi-square contingency table for the distribution of functional types across the PSY100, PSY300 and published corpora

This chi-square test indicates a significant difference among the three corpora. These results clearly support the previous observations in that the published writers use significantly more participant-based bundles while the third-year and first-year students' greater use of the research-based and text-based bundles, respectively, contributes significantly to the overall chi-square result. Of the three functional types, the most significant difference may be found

in the use of participant-based bundles. These include bundles which serve to convey the writer's stance, such as *are more likely to*, *it is important to* and *it is possible that*, as well as engagement bundles which are directed at the reader, such as *it should be noted* and *important to note that*, with the stance bundles occurring far more frequently. It is evident that the two groups of students use significantly fewer participant-based bundles than the published writers, with the first-year students using fewer than the third years. As with the finding for the functional types/language background hypothesis (§4.3.2.3), this concurs with Hyland's (2008b) observations regarding the discrepancy between students' and published writers' use of stance bundles in particular. The issue of students' apparent reluctance to use participant-oriented bundles and hedging is examined further in the qualitative analysis (§4.3.5).

The significantly greater use of research-based bundles by third-year students corresponds to the finding that they use more noun-based bundles than do the first years (Table 4.30), as argued in the previous section (§4.3.3.2). This again lends credence to the argument that the higher level students have learnt to use more of the bundles found in published writing over the course of their undergraduate studies. However, the students' overuse of these bundles relative to the published writers also suggests that the classification of a considerable proportion of bundles in the student corpus as belonging to the sub-category 'description' should be reviewed, thus providing additional grounds for further research into the classification of functional types (§2.3.5.2). Furthermore, the finding in this case that first years use more text-based bundles than either third years or published writers links to Nekrasova's (2009) conclusion that students know more text-based than research-based bundles, although unlike this study, Nekrasova found no difference between intermediate and advanced L2 students in their grasp of these functional types. Cortes (2004:414), on the other hand, found that "students at higher academic levels, especially in graduate writing, used text organisers ... much more often than lower level students".

Although the significantly less frequent use of the participant-bundles by the PSY100 and PSY300 students follows a similar pattern to the findings for the AL and L1 students in HLB2c (§4.3.2.3), there are no further similarities as the L1 students were found to use the least participant-based bundles, while the results for both the research-based and text-based bundles differ. Nevertheless, as with the parallel hypothesis, there is again tenuous support for the assumption being tested in that, while the third-year students' use of research-based bundles differs markedly from that of the published writers, there is evidence that their use of the participant-based and text-based bundles is less dissimilar to the published writers than is the use of these bundles by the first-year students. It is important to stress, however, that, on the basis of the chi-square test results, there are no discernible patterns which clearly

distinguish the use of the structural and functional bundles in the AL corpus from their use in the L1 corpus, or in the PSY100 corpus from the PSY300 corpus. In line with Cortes' (2004:414) recommendation that a more detailed investigation of those lexical bundles which occur more frequently in higher level students' writing be conducted, one of the aims of the qualitative analysis is to assess whether third years use of bundles differs noticeably from that of first years.

The last set of quantitative results in the section on lexical bundles to be discussed moves away from comparisons with the published corpus to consider the question of the students' use of the target bundles in essay writing in contrast to their use of these bundles in the IELTS writing test.

4.3.4 Lexical bundles and IELTS (HLB4)

HLB4 (Lexical bundles and IELTS hypothesis)

Students' use of lexical bundles in their essays will approximate their use of lexical bundles in the writing component of the IELTS test.

The basis of this hypothesis is that, since the IELTS test is used by many universities as an indicator of students' academic language proficiency (§2.4), the IELTS writing test should elicit features of language common to student academic writing. As one aspect of these linguistic features, the lexical bundles used in the IELTS writing test should be comparable to those used in student essays.

The main hypothesis gives rise to three operational hypotheses which serve to test this assumption in terms of the density of target bundles used, as well as the structural and functional types of these bundles.

4.3.4.1 Lexical bundles (density) and IELTS (HLB4a)

HLB4a Lexical bundles (density) and IELTS hypothesis:

There is a positive relationship between the density of target lexical bundles used by students in the IELTS writing test and in their essays.

As in the case of the previous investigations into lexical bundle use by various student groups (§4.3.1, §4.3.2 and §4.3.3), the first operational hypothesis focuses on density of occurrence.

The overall frequencies and relative proportions of target bundles used in the IELTS corpus, the first- and third-year student corpora, and the published corpus are set out in Table 4.34.

	No. of texts in corpus	No. of words in corpus	Number of target bundles	Percentage of total in prof. corpus	Percentage of TBs in corpus
IELTS	148	43 635	29	0.40%	0.27%
PSY100 corpus	471	600 411	1 166	15.98%	0.78%
PSY300 corpus	584	1 340 449	3 986	54.63%	1.19%
Pub. corpus	280	1 809 866	7 297	100%	1.61%

Table 4.34: Target bundle frequencies in the IELTS, PSY100 and PSY300 student corpora relative to the published corpus

As in the previous hypotheses relating to lexical bundles, the target bundles identified in the published corpus are regarded as the benchmark in terms of which the students' use is assessed. In the light of this, column 5 represents the proportion of target bundles from the published corpus used by each of the student groups. It is clear from these percentages that there is a considerable increase in the use of lexical bundles from the IELTS test to first year, and from first year to third year. The percentage of target bundles in each corpus illustrates a clear upward gradient, representing steadily increasing use of the target bundles across the three student corpora. The degree to which the frequencies in Table 4.34 are significant were tested by means of the log-likelihood ratio, as presented in Table 4.35.

	Frequency of target bundles	No. of words in corpus	Log-likelihood value*	Sig.
PSY100	1 166	600 411	46.47	$p < 0.0001$
IELTS	29	43 635		
PSY300	3 986	1 340 449	112.12	$p < 0.0001$
IELTS	29	43 635		

- * Overuse in Corpus 1

Table 4.35: Log-likelihood comparison of target bundle frequencies between PSY100, PSY300 and IELTS corpora

It is clear from these results that, while there is a significant difference between the density of target bundles in the IELTS writing test and the first-year essays, with far fewer bundles being used in the IELTS test, this difference is far greater in the case of the IELTS test and the third-year essays. There is therefore no evidence to support the hypothesis that there is a positive

relationship between students' use of lexical bundles in the IELTS writing test and in their undergraduate essays given that there are significantly more bundles used in the academic essays.

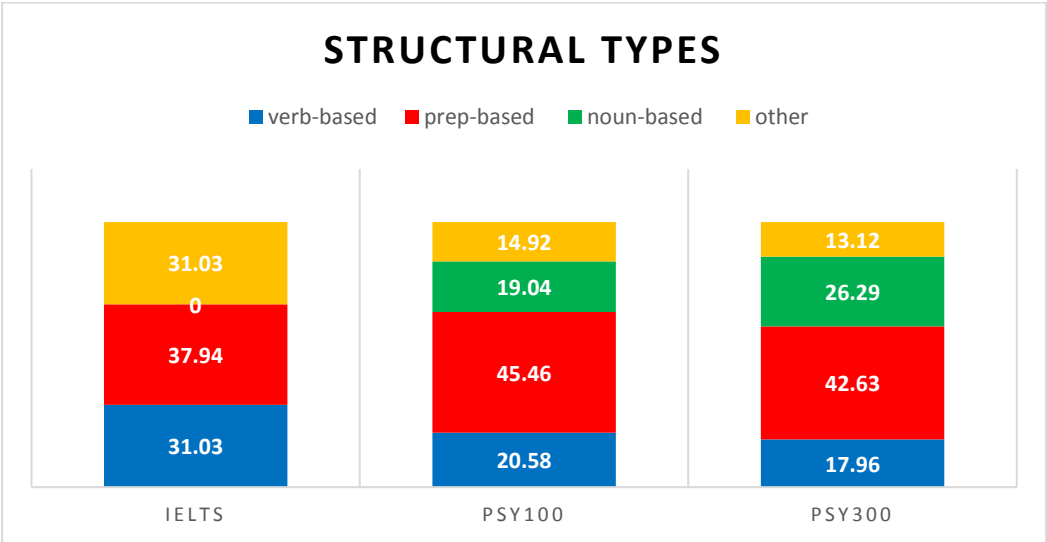
The next operational hypothesis to be considered explores the students' use of particular bundle structures across the three corpora.

4.3.4.2 Lexical bundles (structures) and IELTS (HLB4b)

HLB4b Lexical bundles (structures) and IELTS hypothesis:

There is a positive relationship between the distribution of structural types of target lexical bundles in the IELTS writing test and in the students' essays.

As in HLB4a, the aim of this hypothesis is to examine the link between students' use of bundles in their essay writing and in the IELTS test on the grounds that, as a predictor of academic performance, the IELTS test may, to some degree, be expected to elicit the kind of writing required in academic essays. The first step in testing this hypothesis was to conduct a frequency count of structural types, on the basis of which the relative proportions of occurrence within each corpus was calculated, as illustrated in the bar graph below.



Graph 4.7: Representation of the overall distribution of structural types across the IELTS, PSY100 and PSY300 corpora

One of the most striking differences evident in this data is that none of the noun-based target bundles are found in the IELTS test corpus, while a far greater proportion of verb-based and

'other' bundles occur. A detailed breakdown of the frequency of structural types is provided in the Table 4.36.

	Structural types	Frequency and relative proportion - IELTS corpus	Frequency and relative proportion - PSY100 corpus	Frequency and relative proportion - PSY300 corpus
VERB BASED	Verb phrase + <i>to</i> -clause fragment	9 (31.03%)	121 (10.38%)	302 (7.58%)
	(Passive) VP + prep phrase (fragment)	0 (0%)	0 (0%)	0 (0%)
	(Passive) VP + noun phrase	0 (0%)	58 (4.97%)	106 (2.66%)
	Anticipatory <i>it</i> + VP + <i>to</i> -clause (fragment)	0 (0%)	32 (2.74%)	229 (5.75%)
	Anticipatory <i>it</i> + VP (adj.) + complementizer	0 (0%)	29 (2.49%)	79 (1.98%)
	Anticipatory <i>it</i> + VP	0 (0%)	0 (0%)	0 (0%)
	TOTALS – verb based bundles	9 (31.03%)	240 (20.58%)	716 (17.96%)
PREPOSITION BASED	Prepositional phrase	11 (37.94%)	91 (7.81%)	480 (12.04%)
	Prepositional phrase + <i>of</i>	0 (0%)	385 (33.02%)	937 (23.51%)
	Prepositional phrase + complementizer	0 (0%)	54 (4.63%)	282 (7.07%)
	TOTALS – prep based bundles	11 (37.94%)	530 (45.46%)	1 699 (42.63%)
NOUN BASED	Noun phrase + post-nominal clause (fragment)	0 (0%)	94 (8.06%)	472 (11.84%)
	Noun phrase + <i>of</i>	0 (0%)	38 (3.26%)	349 (8.76%)
	Noun phrase + prep. phrase (fragment)	0 (0%)	53 (4.55%)	66 (1.65%)
	Noun (phrase) + (passive) VP	0 (0%)	0 (0%)	80 (2.01%)
	Noun phrase + complementizer	0 (0%)	37 (3.17%)	81 (2.03%)
	TOTALS – noun based bundles	0 (0%)	222 (19.04%)	1 048 (26.29%)
OTHER	Adverbial phrase	9 (31.03%)	148 (12.69%)	323 (8.10%)
	Adjectival phrase	0 (0%)	0 (0%)	67 (1.68%)
	<i>That</i> -clause fragment	0 (0%)	26 (2.23%)	133 (3.34%)
	Conjunction + NP	0 (0%)	0 (0%)	0 (0%)
	Modal + VP	0 (0%)	0 (0%)	0 (0%)
	Dummy subject + VP	0 (0%)	0 (0%)	0 (0%)
	TOTALS - other	9 (31.03%)	174 (14.92%)	523 (13.12%)
OVERALL TOTALS	29 (100%)	1 166 (100%)	3 986 (100%)	

Table 4.36: Density of structural types in the IELTS corpus, PSY100 student corpus and PSY300 student corpus

It is immediately evident from these results that there is very little variation in the use of the target bundles within IELTS as these are limited to three grammatical forms: verb phrase + *to*-clause fragment (*to be able to*), prepositional phrase (*on the other hand*) and adverbial phrase

(as well as *the*). There is therefore obviously considerable disparity in the application of structural types by students in essay writing as opposed to writing for the IELTS test.

As in the previous hypotheses, the degree to which these differences in the use of structural types may be regarded as significant was tested by the application of the Pearson chi-square test. The results of this test, as presented in Table 4.37 below, reflect significant differences across all three corpora in the use of noun-based target bundles, with both the IELTS and first-year corpora containing significantly fewer than expected, while the third-year corpus contains considerably more. The only other significant difference among the three corpora is found in the ‘other’ category, with significantly more of these structural types occurring in the IELTS corpus.

$\chi^2 (6) = 42.739^a, p < .001, n = 5181$			Corpora		
			IELTS	PSY100	PSY300
Structural types	verb	Count	9	240	716
		Expected Count	5.4	217.2	742.4
		Std. Residual	1.5	1.5	-1.0
	prep	Count	11	530	1699
		Expected Count	12.5	504.1	1723.3
		Std. Residual	-.4	1.2	-.6
	noun	Count	0	222	1048
		Expected Count	7.1	285.8	977.1
		Std. Residual	-2.7	-3.8	2.3
	other	Count	9	174	523
		Expected Count	4.0	158.9	543.2
		Std. Residual	2.5	1.2	-.9

a. 1 cell (8.3%) has expected count of less than 5⁴⁷. The minimum expected count is 3.95.

Table 4.37: Standardised residuals in a chi-square contingency table for the distribution of structural types across the IELTS, PSY100 and PSY300 corpora

It may be argued from the overall frequencies presented in Table 4.36 that there are considerable differences in the way in which all grammatical forms within the structural types are used in student essays and in the IELTS writing test. Given the minimal overlap in shared bundles which occur in both the IELTS and essay corpora, the gaps left by those bundles not used in the IELTS corpus represent a considerable difference between these two corpora. These differences do not support the hypothesis made with regard to the existence of a

⁴⁷ “For a rows by columns chi-square test, at least 80% of the cells must have an expected frequency of 5 or greater, and no cell may have an expected frequency smaller than 1.0.” <http://vassarstats.net/newcs.html> In this case, 91.7% of the cells have an expected count of 5 or more.

relationship between the ways in which the structural types are distributed within the two distinct genres. There is therefore little evidence to support the operational hypothesis regarding the occurrence of structural types in the IELTS writing test and student essays.

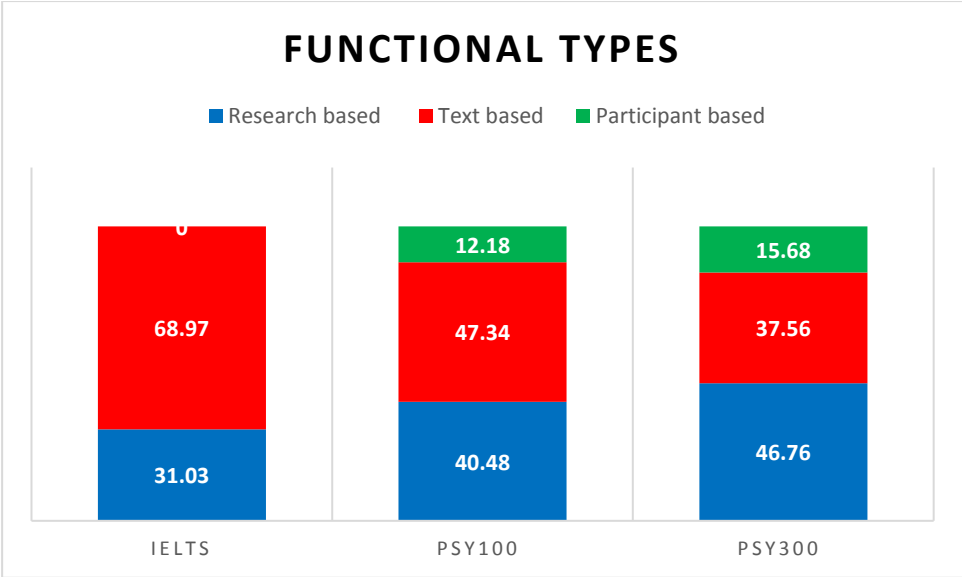
The next hypothesis similarly assumes a relationship between target bundles and student writing in essays and in the IELTS test, although the focus of this hypothesis is on functional types.

4.3.4.3 Lexical bundles (functions) and IELTS (HLB4c)

HLB4c Lexical bundles (functions) and IELTS hypothesis:

There is a positive relationship between the distribution of functional types of target lexical bundles in the IELTS writing test and in the students' essays.

As in the case of HLB4b, the context of this hypothesis is that students' use of functional types will be consistent across both the IELTS writing test and their academic essays. This assumption is based on the fact that IELTS is intended as a predictor of academic performance, and so should reflect similarities in student writing despite the differences in genre. However, the lack of variation in sub-categories of functional types in the IELTS corpus is clearly illustrated in Graph 4.8 below.



Graph 4.8: Representation of the overall distribution of functional types across the IELTS, PSY100 and PSY300 corpora

It is evident once again from the descriptive statistics presented in Table 4.38 that the majority of functional types are not found in the IELTS corpus. This is to be expected as the three target

bundles identified as occurring in the IELTS texts fulfil only two functions: transition (*on the other hand, as well as the*) and description (*to be able to*).

	Functional types	Frequency and relative proportion - IELTS corpus	Frequency and relative proportion - PSY100 corpus	Frequency and relative proportion - PSY300 corpus
RESEARCH BASED	Location	0 (0%)	72 (6.17%)	383 (9.61%)
	Procedure	0 (0%)	135 (11.58%)	587 (14.73%)
	Quantification	0 (0%)	111 (9.52%)	355 (8.91%)
	Description	9 (31.03%)	154 (13.21%)	539 (13.52%)
	TOTALS – research based bundles	9 (31.03%)	472 (40.48%)	1 864 (46.76%)
TEXT BASED	Transition	20 (68.97%)	239 (20.50%)	527 (13.22%)
	Resultative	0 (0%)	141 (12.09%)	396 (9.93%)
	Framing	0 (0%)	172 (14.75%)	574 (14.40%)
	TOTALS – text based bundles	20 (68.97%)	552 (47.34%)	1 497 (37.56%)
PARTICIPANT BASED	Stance	0 (0%)	142 (12.18%)	558 (14.00%)
	Engagement	0 (0%)	0 (0%)	67 (1.68%)
	TOTALS – participant based bundles	0 (0%)	142 (12.18%)	625 (15.68%)
OVERALL TOTALS		29 (100%)	1 166 (100%)	3 986 (100%)

Table 4.38: Densities of functional types in the IELTS, PSY100 and PSY300 corpora

The use of two transition bundles and one description bundle accounts for the proportion of text-based to research-oriented functional types (§2.2.5.2, Table 2.2), that is, 69% to 31%. It should be noted here that, while a considerable proportion of lexical bundles in the IELTS corpus have been found to be participant-based (Cooper, 2013), these tend to be more typical of spoken discourse or the expression of personal opinion, for example, *I agree with the* and *should be given the [opportunity to]*, and so did not correspond to the target bundles identified as most frequent in the published corpus. For this reason the IELTS data presented above do not include either stance or engagement bundles, both of which are classified as participant-based.

The results of a Pearson chi-square test, applied to the data in Table 4.38 to determine whether the results were significant, are presented in Table 4.39 below. The results of this chi-square test indicate that there is a significant difference among the three corpora. While the participant-based bundles are considerably underused in the IELTS corpus, as anticipated, it should also be noted that these are underused to an even greater degree in the first-year corpus, as was found in HLB3c (§4.3.3.3, Table 4.33). This finding ties in with the third-year

students' use of engagement bundles such as *important to note that* and *this can be seen*, in contrast to both the IELTS and first-year student corpora, in which no engagement bundles are evident. The results also illustrate that research-based bundles (e.g. *at the same time*, *the degree to which*, *the nature of the*) are significantly underused by first-year students in contrast to the third-year students in particular. The *R* values for the text-based bundles (e.g. *as well as the*, *due to the fact that*, *in the case of*) show that these are significantly overused in the IELTS corpus and, more extensively, in the first-year corpus, while being underused in the third-year corpus.

			Corpora		
			IELTS	PSY100	PSY300
$\chi^2(4) = 48.745^a, p < .001, n = 5181$					
Functional types	Part.-based	Count	0	142	625
		Expected Count	4.3	172.6	590.1
		Std. Residual	-2.1	-2.3	1.4
Res.-based	Res.-based	Count	9	472	1864
		Expected Count	13.1	527.7	1804.1
		Std. Residual	-1.1	-2.4	1.4
Text-based	Text-based	Count	20	552	1497
		Expected Count	11.6	465.6	1591.8
		Std. Residual	2.5	4.0	-2.4

a. 1 cell (11.1%) has expected count of less than 5. The minimum expected count is 4.29.

Table 4.39: Standardised residuals in a chi-square contingency table for the distribution of three forms within the functional types across the IELTS, PSY100 and PSY300 corpora

The obvious discrepancy between the frequent occurrences of a number of functional types in the student essays, in contrast to the complete absence of these types of bundles in the IELTS writing test means that the hypothesis regarding the distribution of functional types in the IELTS writing test and in student essays is not supported by these findings.

While this study touches on the issue of prediction of academic performance, it is not a comprehensive investigation into what factors are involved in predicting performance at university level. It must therefore be recognised that this study focuses on one genre of student academic writing (i.e. undergraduate psychology essays), and that the IELTS Task 2 writing test is compared only to this single genre. Although these findings should be cautiously considered, the results of this study nevertheless show that there is very little overlap in the type of lexical bundles found in the student essay and IELTS corpora, indicating a considerable difference between the bundles used in undergraduate writing as opposed to an IELTS-type essay. While it would have to be determined whether the same applies in other disciplines, this

finding supports the idea that the IELTS Task 2 writing test is measuring a somewhat different writing ability, and is therefore not appropriate as a measure of academic performance as exemplified by academic essay writing (cf. §4.4.2).

This study now shifts from discussion of the quantitative data to a qualitative investigation into lexical bundles. This involves an in-depth comparison of bundles in student and published corpora by means of a keyness analysis and examination of concordance lines as well as short extracts where relevant. Following these comparisons, the analysis of the bundle tests conducted prior to the interviews is reviewed and aspects of the interviews are discussed. These aspects include an investigation into the interviewees' use of bundles in their corpora of essays in relation to their academic results, and a discussion of the themes on which the interview questions were focused.

4.3.5 Qualitative study of lexical bundles

As in the qualitative assessment of academic vocabulary, measurements of positive and negative keyness serve to identify lexical bundles which differ significantly between corpora as a result of being either overused or underused within one corpus in relation to the other. The first analysis of differences compares student and published uses of lexical bundles. Then, in addition to a keyness analysis of lexical bundles in the L1 and AL corpora, the corpora compiled from the essays of high achievers were compared to those of the low achievers in first, second and third years. However, unlike in the case of the academic vocabulary, the focus of the keyness analysis in the lexical bundles is on differences in student and published writing. These differences served to highlight idiosyncratic uses, as well as marked variations in the types of lexical bundles used by students in contrast to published writers. The analysis of the various student corpora, on the other hand, did not reflect many differences in bundle use.

The last section in this qualitative study reports on the interviews conducted with 19 of the 160 participants. The report includes a review of the interviewees' performance on a lexical bundles test (Appendix O) in relation to their overall academic performance, particular issues with lexical bundle usage highlighted by the test and a detailed investigation of the bundles used in their essays, as well as the interviewees' perspectives regarding aspects of academic reading and writing, academic vocabulary and lexical bundles. The interviews therefore helped to triangulate the data, thereby enabling various interpretations to be tested.

4.3.5.1 Comparison of lexical bundles in published and student corpora

A number of aspects are considered in this investigation of bundles found in the student corpus in relation to those in the published corpus. These include the high prevalence of genre-, topic- and context-related words in each corpus, differences in the application of functions, students' lack of hedging devices and more assertive style, differences in sentence positioning and the cotext in which bundles occur, and various idiosyncratic and colloquial uses by students which include specific instances of overuse and underuse.

A keyness analysis of the overall student and published corpora, with the latter as the reference corpus, illustrates that bundles which refer directly to South Africa such as *a/the South African context*, *women in South Africa* and *crime in South Africa* have an extremely high keyness value in the student corpus, as do bundles which identify theories, models, processes or conditions in psychology (*the social learning theory*, *the feature integration theory*, *the interactive activation model*, *the organismic valuing process* and *nervosa and bulimia nervosa*). This is to be expected, given that the essay topics required students to discuss issues taken from the South African context (Appendix A), and to examine specific theories and other aspects of psychology in detail, a process that requires constant reference to the matter under discussion. As these differences are context-specific, the focus of this analysis is on the more general lexical bundles with the highest positive and negative keyness values. The top twelve of each category are presented in Table 4.40 below.

Lexical bundle	Frequency in core corpus	% in core corpus	Normalised rate in core corpus	Frequency in ref. corpus	% in ref. corpus	Normalised rate in ref. corpus	Keyness value*
the way in which	680	0.02	18.72	45	0.002	2.46	315.60
as a result of	899	0.02	24.75	106	0.006	5.80	287.71
to the fact that	494	0.01	13.60	36	0.002	1.97	218.42
the back of the	230	0.006	6.33	0	—	0	187.52
can be defined as	306	0.008	8.42	10	—	0.55	182.62
due to the fact	356	0.009	9.80	20	0.001	1.09	177.75
at the age of	205	0.005	5.64	0	—	0	167.14
an example of this	204	0.005	5.62	0	—	0	166.32
when it comes to	259	0.007	7.13	8	—	0.44	156.79
will be able to	241	0.006	6.63	6	—	0.33	153.15
as well as the	785	0.02	21.61	147	0.008	8.04	149.26
is said to be	155	0.004	4.27	0	—	0	126.37
in addition to the	33	—	0.91	62	0.003	3.39	-39.89

Lexical bundle	Frequency in core corpus	% in core corpus	Normalised rate in core corpus	Frequency in ref. corpus	% in ref. corpus	Normalised rate in ref. corpus	Keyness value*
are likely to be	37	0.001	1.02	66	0.004	3.61	-40.10
to be associated with	26	—	0.71	56	0.003	3.06	-41.32
to the extent that	46	0.001	1.26	80	0.004	4.38	-47.20
were more likely to	51	0.001	1.40	92	0.005	5.03	-56.61
the nature of the	76	0.002	2.09	122	0.007	6.67	-65.27
in the absence of	34	—	0.94	83	0.004	4.54	-68.34
the degree to which	85	0.002	2.34	134	0.007	7.33	-70.03
it is possible that	52	0.001	1.43	110	0.006	6.02	-79.79
in the context of	131	0.004	3.61	201	0.01	10.99	-101.33
the extent to which	138	0.004	3.80	217	0.01	11.87	-113.03
on the basis of	80	0.002	2.20	276	0.02	15.10	-289.92

*Significant at $p < .0001$

Table 4.40⁴⁸: Lexical bundles in the student corpus with significantly different frequencies from those in the published (reference) corpus

Lexical bundles were selected for analysis on the basis of their keyness value, and the degree to which they reflected particular traits in student writing, such as the use of colloquial constructions and the tendency to present arguments with little or no hedging (Chen and Baker, 2010; Hewings and Hewings, 2002; Hyland, 2008b). The bundle with the highest positive keyness value is *the way in which*.

The primary difference in use between the student and published corpora, and so the main reason for the high keyness value which indicates overuse by the students, is that students frequently use this bundle when defining terms and concepts, as illustrated by the extracts below. While the L2 collocations (verbs such as *define*, *describe* and *explain*) indicate that the meaning of a term or concept is to be given, the bundle *the way in which* serves a framing function, and so indicates in this context that the definition is procedural. Similarly, the L1 collocations (forms of the verb 'to be') following on from a term signal the start of a definition, with the bundle again indicating procedure.

⁴⁸ KEY to Table 4.40: Normalised rate calculated per 100 000 words; core corpus – student essays (3 631 890 tokens); ref. = reference corpus – published journal articles (1 827 800 tokens)

the real self and the ideal self. The real self is **defined** as **the way in which** one describes himself, whereas the is thus congruent. Congruence is thus **described** as **“the way in which** the individual stills uses their organismic time. People’s behaviour is therefore **determined** by **the way in which** they experience the physical world at level of productivity. Accountability is also **explained** as **the way in which** manages make it known to their knows and understands. Top-down processing **refers** to **the way in which** an individual may perceive something as Roles **are** **the way in which** we participate and interact with each essay, we will adopt the definition of continuity as **being** **the way in which** individuals characteristics (personality) many women work and empower themselves. Spillover **is** **the way in which** our work-life and family-life can affect conducted which looked at the idea of rauding. Rauding **is** **the way in which** most people read, understand or This incorporates the study of Localisation. Localisation **is** **the way in which** different parts of the brain are localised

Figure 4.2: L2 and L1 collocations of *the way in which* in the AL student corpus

The bundles with the second, third and sixth highest keyness values, *as a result of*, *to the fact that*, and *due to the fact*, suggest that students are more likely than published writers to use resultative expressions to make direct links between cause and effect. (The comparison of functions used by published writers in relation to L1 and AL students (§4.3.2.3, Table 4.25) shows that a slightly higher proportion of the bundles used by L1 students are resultative.) This ties in with the argument that students are less likely to use hedging devices as there is also little evidence of the use of modals and adverbs to indicate possibility being used in conjunction with the bundle *as a result of*.

While the bundles *to the fact that* and *due to the fact* initially appear to be overlapping, closer investigation shows that, although *due to the fact* is always followed by *that* in the published corpus, *to the fact that* is preceded by *due* in only 56% of cases, as illustrated below by a number of alternative L1 collocations.

have to rely on a new caregiver. Davis and Konishi **alluded** **to the fact that** being honest and truthful improves coping. and internal health locus of control has been **attributed** **to the fact that** resilient people see themselves as having via many different routes. The second, multifinality, **refers** **to the fact that** any given risk factor, depending on its CD4 and HIV medication use. This is likely **related** **to the fact that** in well-developed countries with ready must implement the behavior. Although we pay lip **service** **to the fact that** we are dealing with individuals in the change on the child, courts give significant **weight** **to the fact that** a child has been continuously known by a complex argument it may be important to bear **witness** **to the fact that** employee engagement is a concept

Figure 4.3: L1 collocations of *to the fact that* in the published corpus

Similarly, in the student corpus, this bundle is preceded by *due* in 68% of cases, with evidence of alternative L1 collocations being used. However, many of these alternatives are not appropriate, as illustrated below.

- 1a. active and healthy citizen, though this does not **account** **to the fact that** readers do not have a choice but are
- 1b. self worth and the self image. Rogers made **mention** **to the fact that** the self was the focus of the personality.

- 1c. through experiences of an early life, although it **demerits to the fact that** it is male biased and that human are
- 1d. The fact that it is deemed an informal settlement **alleviates to the fact that** the living conditions are not optimal – that
- 1e. accepted standards, emotional distress which **eludes to the fact that** these behaviours lead to distress both
- 1f. Consideration needs to be taken into account with **regards to the fact that** without the correct mindset,

The errors in 1a and 1b are grammatical as the student has used the incorrect preposition (**to* rather than *for* and *of*, respectively) in each case, while the error in 1c is semantic as *demerits* cannot be used as a verb. The fourth and fifth examples appear to be based on confusion between the words *alleviates* and *alludes* (1d), and *eludes* and *alludes* (1e), probably as a result of the phonological similarity of the first syllables (Cooper, 1999: 57-58; Laufer, 1990). The grammatically idiosyncratic form **with regards to the* (1f) has an extremely high frequency within the student corpus, with a positive keyness value of 125.55. It would appear that the bundle *with regard to the* has been confused with the phrase *as regards* since both mean ‘in connection with’ (Cambridge International Dictionary of English, 1995:1193). It may be argued on the basis of the number of occurrences of the idiosyncratic form *with regards to the* (154 in the student corpus vs 0 in the published corpus) that this variant is spreading within this segment of the population of South African English speakers, and may become accepted as standard in this dialect (cf. Van der Walt and Van Rooy, 2002; Van Rooy, 2011).

An additional point of interest in relation to the bundle *to the fact that* is that, while *owing* does not occur as a collocation in the published corpus, the preposition *owing (to)* collocates with this bundle in 10% of the cases in the student corpus. This suggests that this is a colloquial construction which may be regarded as less conventional within the academic context than the five-word bundle *due to the fact that*. While *due to the fact* is followed by *that* in 96% of cases in the student corpus, this contrasts with the 100% of cases in the published corpus. The few instances in which students did not use *that* suggest a poor grasp of the syntactic properties of this bundle.

a large growth of personality does happen in childhood **due to the fact a** child is an open canvass and in quick
 the FIT, there reliability and validity are questionable this **due to the fact it** is not certain that the instruments used
 has had major dramatic impact on gender violence **due to the fact of** polygamy, multiple partners, patriarchal
 the object of love and reject her inferior mother (inferior **due to the fact she** has no penis). Eventually, the girl will
 one may then argue that they eventually get bored at work **due to the fact they** get assigned to fixed duties.
 as warriors of domestic work as opposed to work is **due to the fact women** are more vocal about their

Figure 4.4: R1 collocations of *due to the fact* in the student corpus

Another example of colloquial usage is the bundle *when it comes to* which has the ninth highest keyness value in Table 4.40. It seems that its primary role in the published corpus is to foreground new information or key terms, as illustrated in the concordance lines in Figure 4.5.

or unlocking the knowledge possessed by an organization. *When it comes to job* design in the Indian context, are more likely to engage in positive peer play generally. *When it comes to pretend* play specifically, however, need to be created between universities and communities. *When it comes to research* that is pertinent to the

Figure 4.5: R1 collocations of *when it comes to* in the published corpus

The examples reflect the general findings of the corpora that this bundle is used much less frequently at the start of a new sentence in the student as opposed to the published corpus. While not wrong, the majority of these uses are somewhat marked within the academic context as they contrast strongly with the restricted use of this bundle by published writers. Although the R1 collocations *developing* (2a) and *smoking* (2b) provide suitable contexts for this bundle, the other collocations would arguably more appropriately be preceded by the bundles *in the case of* (2c and 2d) and *in the context of* (2e and 2f).

- 2a. . They will have more control over their work especially *when it comes to developing* relationships and having
- 2b. doctor affects the patients in a particular way, particularly *when it comes to smoking*. The main reason for the
- 2c. is no differentiation between pretending versus deception *when it comes to animals*. There is some research,
- 2d. of self-help literature is that the individual is at fault *when it comes to depression*. The individual has failed to
- 2e. to distinguish between normal and abnormal behaviours *when it comes to food* and eating. For example, a
- 2f. most importantly promoting better communication skills, *when it comes to health* choices. Individual behaviour

While *in the case of* has similar densities in the two corpora, it is clear from the negative keyness value in Table 4.40 that *in the context of* is considerably underused by students in relation to the published writers, suggesting a degree of unfamiliarity with this bundle. Some of the more common L1 collocates in the published corpus (*adaptation, behaviour, interpreted and understood*) are not found in the student corpus, supporting the argument that students are not completely familiar with the semantic networks associated with this bundle.

Another bundle that is significantly overused by students is *as well as the*. This is generally used in the published corpus when linking two closely related concepts, as illustrated in Figure 4.6.

of both types of attributes requires identifying the *absence, as well as the* presence, of these connections. The field in the same urban area, the socio-economic *backgrounds as well as the* racial compositions of their learner

and to design intervention programmes on the communal as well as the primary care level. In addition, it is respondents simultaneously believe that personal control as well as the influence of powerful others are critical to at the letter level interacted with a phonological level as well as the word level. Perhaps the most interesting . A biopsychosocial model which includes the patient as well as the illness would encompass both

Figure 4.6: L1 collocations of *as well as the* in the published corpus

In addition to using *as well as the* far more broadly than do published writers, students frequently use this bundle instead of the more appropriate *in addition to the*. The result is that the latter is underused, as reflected by the negative keyness value in Table 4.40. The examples below illustrate the use of *as well as the* instead of *in addition to the* (3a and 3b), the conjunction *and (the)* (3c and 3d), and the phrase *together with* (3e and 3f), which may be viewed as better suited to the context in each case. The last example (3g), in which the conjunction *and* immediately precedes the adverb, illustrates the redundant use of this bundle.

- 3a. travel arrangements in terms of flights and accommodation as well as the necessary itinerary for business trips. She
- 3b. relation to violent crime in South Africa, regarding gender as well as the national repercussions. Furthermore,
- 3c. equally accessible, both due to technological advances as well as the ending of the apartheid regime, and
- 3d. be seen as unfair as the individual might have changed, as well as the study would not be valid because it does
- 3e. be discussed in the context of post-apartheid South Africa, as well as the gender and age specificity of these
- 3f. sense of body shame in this community. These factors as well as the factors that influence heterosexual men
- 3g. of Erikson's theory will consists of positive aspects and as well as the negative aspects. Many people believed

The bundles *can be defined as*, *an example of this* and *is said to be* may be expected to have a high keyness value in the student corpus as these would be used when defining terms, providing examples in support of arguments and citing references. These features may be regarded as typical of essay writing since students are required to show that they have read a range of sources, understood the arguments presented, and are able to relay these in their own words.

Consideration of the negative keyness bundles in Table 4.40 provides additional evidence of the lack of hedging in student writing. The bundles that are significantly underused by students such as *it is possible that*, *the degree to which*, *were more likely to*, *are likely to be*, *to the extent that* and *the extent to which* suggest that published writers moderate their arguments to a greater degree. This impression is strengthened by examples of bundles in the student corpus that express assertion rather than persuasion. Although these bundles have lower positive keyness values than those in Table 4.40, they are nevertheless significantly overused. This can be seen in the table below.

Lexical bundle	Frequency in core corpus	% in core corpus	Normalised rate in core corpus	Frequency in ref. corpus	% in ref. corpus	Normalised rate in ref. corpus	Keyness value
one is able to	136	0.004	3.74	5	—	0.27	78.61
this is evident in	86	0.002	2.37	0	—	0	70.11
this is because the	68	0.002	1.87	0	—	0	55.44
it can be concluded	63	0.002	1.73	0	—	0	51.36
one can see that	47	0.001	1.29	0	—	0	38.32
will result in the	46	0.001	1.27	0	—	0	37.50
is as a result (of)	43	0.001	1.18	0	—	0	35.06
it is because of	41	0.001	1.13	0	—	0	33.43
one can say that	34	—	0.94	0	—	0	27.72
this will result in	34	—	0.94	0	—	0	27.72

Table 4.41: Additional lexical bundles in the student corpus which are significantly overused in relation to the published (reference) corpus

It is important to note that, of the ten examples provided in Table 4.41, only *one is able to* occurs in the published corpus. Furthermore, *one* is not used to refer to the self or the writer in this context, unlike in the student corpus. The difference is illustrated in the two sets of concordance lines below.

being interdependent. It thus signifies a conviction that *one is able to have* an effect on others and is willing to four items for factor 6 freedom and power. With money, *one is able to have* autonomy, freedom, and security, be at a given moment. Once this point has been grasped, *one is able to increase* reading speed. Then larger parts

Figure 4.7: R1 collocations of *one is able to* in the published corpus

In each of the concordance lines taken from the published corpus, *one* is used in a generalised sense to refer to any person. In addition to this meaning, the students also use *one* to refer to themselves, usually when presenting an argument, as illustrated in Figure 4.9. The use of *one* to mean 'I' is also evident in the bundles *one can see that* and *one can say that*, both of which are significantly overused in the student corpus (Table 4.41). It is possible that this use is an attempt to avoid the use of the first person pronoun 'I' as the use of the first person is discouraged in a guide to essay writing given to students at the start of their first year (Human, 2011:12).

or for discontinuity within personality development, *one is able to assess* that evidence supporting the , culture, gender and class within a South African context, *one is able to conclude* although further conclusive victims today. In conclusion, through the above essay, *one is able to deduce* that each theory based on gender well and thrived throughout the lifespan. From this study, *one is able to show* continuous personality that changes

Figure 4.8: R1 collocations of *one is able to* in the student corpus

The remainder of the bundles in Table 4.41 also reflects the more assertive style that tends to be used by students. Claims such as *this is evident*, *this is because* and *it can be concluded* often tend to be qualified in academic writing, with verb phrases such as ‘may be’, ‘could be’ and ‘appears to be’, and adverbs such as ‘perhaps’ being used in place of the present simple form of the verb ‘to be’. There is little evidence of the use of such hedges in the student corpus, however. By way of example, ‘perhaps’ has a stronger collocational link to *because* in the published corpus (LL: 140.20) than in the student corpus (LL: 56.03). Furthermore, the bundle *it can be concluded*, as used by students, does not contain a subject, with the result that no accreditation is given, unlike in the case of the published corpus where the bundles *the authors concluded that* and *they / ‘proper noun’ concluded that* are more often used, with only five of the 148 instances of *concluded* (3.4%) being used without a clearly identifiable subject. Finally, the use of the modal ‘will’ in the bundle *will result in the* is another example of assertive writing as ‘will’ indicates a strong likelihood rather than a possibility, as illustrated in Figure 4.9.

of the brain. Lesions to corresponding areas of the brain will result in the deficit of that function. The frontal lobe is the child is given. Consistent, predictable and reliable care will result in the development of trust which the child will space with someone else and negative ego development will result in the individual being unable to share emotions

Figure 4.9: R1 collocations of *will result in the* in the student corpus

The discussion now moves from a focus on overuse and underuse to instances of the colloquial, non-standard, erroneous or otherwise idiosyncratic use of bundles by students. These were fairly easily identified as they occur far less, if at all, in the published corpus, and so have a high keyness value.

The first of these to be compared is the students’ use of *is based on the* (+36.38⁴⁹) as opposed to *on the basis of* (-289.92). While neither colloquial nor non-standard, it is marked by significant overuse, from which it appears that the verb-based bundle favoured by the students reflects a general trend for students to use fewer noun- and preposition-based bundles than do published writers (Chen and Baker, 2010). However, the results presented in Graph 4.3 and Table 4.22 (§4.3.2.2) do not support this argument as a higher percentage of verb-based bundles occurs in the published corpus, while there is little difference between the two corpora in the percentages of preposition- and noun-based bundles used. The comparative densities of structural types are presented in Table 4.42.

⁴⁹ Keyness value

Structural type	Published corpus	Student corpus
Verb based	1 748 (23.95%)	1 537 (18.78%)
Preposition based	3 158 (43.28%)	3 442 (42.07%)
Noun based	1 865 (25.56%)	2 011 (24.58%)
Other	526 (7.21%)	1 192 (14.57%)
TOTAL	7 297 (100%)	8 182 (100%)

Table 4.42: Overall density of structural types in the published and student corpora

On closer investigation, however, these unexpected results may be accounted for by a few bundles with high positive and negative keyness values in the student corpus in relation to the published corpus, as illustrated in Table 4.43 below.

Lexical bundle	Structural type ⁵⁰	Frequency in core corpus	Normalised rate in core corpus	Frequency in ref. corpus	Normalised rate in ref. corpus	Keyness value*
the way in which	NP + prep. phrase	680	18.72	45	2.46	315.60
with regards to the	Prep. phrase	154	4.24	0	0	125.55
as a result of	PP + of	899	24.75	106	5.80	287.71
to the fact that	PP + comp	494	13.60	36	1.97	218.42
in the sense that	PP + comp	156	4.29	26	1.42	34.80
one of the most	NP + post.	236	6.50	55	3.01	30.64
due to the fact	OTHER (adv.)	356	9.80	20	1.09	177.75
as well as the	OTHER (adj.)	785	21.61	147	8.04	149.26
were more likely to	VP + to clause	51	1.40	92	5.03	-56.61
are likely to be	VP + to clause	37	1.12	66	3.61	-40.10
to be associated with	VP + prep.	26	0.72	56	3.06	-41.32
the size of the	NP + of	33	0.91	55	3.01	-30.84
the basis of the	NP + of	34	0.94	55	3.01	-29.71

*Significant at $p < .0001$

Table 4.43: A selection of structural types in the student corpus with significantly different frequencies from those in the published (reference) corpus

It has been found that students commonly overuse a number of lexical items rather than using a broad range of different items (Ädel and Erman, 2012; De Cock, 2000; Granger and Paquot, 2009; Hasselgren, 1994; and Paquot, 2010; §4.2.5.1). This practice clearly extends to the overuse of lexical bundles, given that a keyness analysis of the student corpus in relation to

⁵⁰ KEY to structural types: PP + comp. = prepositional phrase + complementizer; NP + post. = noun phrase + post-nominal clause fragment / other post modification; VP + prep. = verb phrase + prepositional phrase fragment

the published corpus showed that 1408 types of bundles had been overused by students, ranging from a keyness of 446.80 to 23.95.

A number of bundles with positive keyness values in the student corpus reflect informal, colloquial usage by students that may be regarded as inappropriate in the genre of the academic essay. These include bundles such as *this is known as*, *this will be done* and *this is when the*, none of which occur in the published corpus. Rather than the definitive form *is known*, published writers tend to qualify the bundle *is known about the* by preceding it with *little*, *less* or *nothing*, or by using it in the negative (*it is not known*). This argument is supported by the figures presented in Table 4.44 which illustrates the occurrence⁵¹ of *is*, *little* and *not* in relation to *known* in both student and published corpora.

Position and collocate	Published corpus	Student corpus
L1: <i>is</i>	24.47%	34.94%
L1: <i>not</i>	7.34%	1.47%
L2: <i>little</i>	9.44%	0.13%

Table 4.44: Percentage occurrence of *is*, *not* and *little* in relation to *known* in published and student corpora

While both published writers and students use the phrase *to be known as* to introduce a term, theory or approach, the difference in their uses lies primarily in the degree of assertiveness. The phrase *has come to be known as*, which is found in the published corpus, implies that a number of authorities in the field have recognised the theory or approach. The writer is thus taking into account the evolving body of research, suggesting an awareness of changes and progress made in the field.

of gays and lesbians located in what has **come to be known as** "queer theory", calls this phenomenon social world presents, a mental shortcut that has **come to be known as** the cognitive miser hypothesis. Because has considerable force with respect to what has **come to be known as** folk psychology, in particular its strongest

Figure 4.10: L1 collocations of *to be known as* in the published corpus

The students use of the phrase *is known as the*, on the other hand presents the term or theory as a *fait accompli*, with no acknowledgement of the academic discourse through which the concept would have evolved, thereby adopting a far more assertive rather than persuasive style.

⁵¹ This is calculated as a percentage as log-likelihood values are not presented in WST for specific collocational positions such as L1.

life. This natural tendency towards maturation and growth is known as the actualising tendency, and is a natural . Erikson's approach to psychosocial development is known as the life-span approach. There are eight first step to processing an image of the object in question is known as the preattentive stage. In this stage objects to recognize in words than alone or in non-words which is known as the word superiority effect. As soon as a

Figure 4.11: R1 collocations of *is known as the* in the student corpus

The bundle *this will be done* is again particular to the students' essays and introduces a colloquial flavour into the writing. It is followed in the majority of cases either by the preposition *by* or *through* so as to introduce a method or procedure. The fact that the word *done* does not occur in any of the bundles in the published corpus supports the argument that its use is more appropriate to informal rather than academic genres. This is further illustrated by the fact that the word *done* has a frequency of 215 in the published corpus, covering only 0.01% of this corpus. This verb occurs primarily in the passive form, preceded by the copula verb 'to be' or the auxiliary 'have' in 84% cases, as illustrated in the concordance lines below:

latter has to be executed just once when both tasks are done at the same time. For example, to estimate the by an increasingly diverse work force and in what can be done to ensure that the benefits of diversity outweigh its patterns and stability of behavior, and very little has been done to explore gender development in terms of micro attendance, this informed consent process may have done more harm than good in the context of minimal or and flooding, and makes sure that skill training is done within a philosophic framework of trying to help discriminable alternatives. Since these two studies were done in different laboratories with slightly different

Figure 4.12: L1 collocations of the word *done* in the published corpus

While there is evidence that a number of 3-word bundles such as *can be done* and *could be done* occur in the published corpus, *done* is used relatively infrequently, which partially explains why it is not incorporated into any 4-word bundles.

The last of the three examples of colloquial usage given earlier, *this is when the*, is commonly followed by nouns such as *adolescent*, *adult*, *child*, *infant*, *neonate*, *mother*, *patient*, *teenager* and *therapist*, as illustrated by the concordance lines below.

of pubic hair and facial hair and deepening of the voice. This is when the adolescent develops an identity and growth. Erikson's eighth stage is integrity versus despair. This is when the adult has completed every other stage , which faces the child between the ages of six to twelve. This is when the child learns to function socially outside in South Africa is the social learning theory because this is when the individual observes the different the ages from two to seven years. In these two stages, this is when the infants gain knowledge about the media glorification, family influence to Anorexia Nervosa. This is when the mother of the girls with eating disorders works from birth to about eighteen-twenty four months old. This is when the neonate is extremely dependent on this lobe, a syndrome called unilateral neglect is formed. This is when the patient does not pay attention or is that many researchers had "fallen victim to a play ethos". This is when the researcher's bias towards the topic role confusion, spans from adolescence to early adulthood. This is when the teenager will make decisions that will

Figure 4.13: R1 collocations of *this is when the* in the student corpus

Of the R1 collocates which follow this bundle, 84% share the semantic feature [+PERSON]. It is not possible, however, to determine whether this pattern is followed in published writing as this bundle does not occur in the published corpus. A final example of colloquial use, *plays a huge role*, appears to reflect a rather restricted vocabulary as a number of students rely on basic adjectives that contrast strongly with many of the adjectives which collocate with *role* in the published corpus, such as *mediating*, *central*, *crucial* and *key*, all of which are far more finely nuanced than the descriptor *huge*.

In line with the earlier discussion of the idiosyncratic bundle **with regards to the*, the focus now turns to irregular lexical bundles. These include **in accordance to the*, **in a sense that*, and **in a sense of*. While the first one is incorrect as a result of the use of the wrong preposition, **in a sense that/of* should be *in **the** sense that/of* as the bundle is typically followed by a specific analogy, definition or explanation which requires the use of the definite article. These grammatical errors reinforce the view that prepositions and articles are aspects of the grammar that often pose problems for additional language students in particular (Elturki, 2014; Lorincz and Gordon, 2012; Miller, 2005).

Finally, a bundle that is notably underused by students is *on the one hand*. While *on the other hand* may be regarded as being used to a similar extent by both students and published writers as it does not have a significant keyness value, the corresponding form, which is used to signal that two sides of an argument are to be discussed, is very rarely used by students. Although the students' use of *on the other hand* generally reflects a good understanding of the meaning and function of this bundle, in one case it is repeated twice within a single construction. In this example it seems likely that the student, for whom English is an additional language, is not familiar with the bundle *on the one hand*. This is illustrated in the extract below:

This resulted in progressive laws and affirmative action practices applied to women *on the other hand*; and yet *on the other hand* extremely conservative attitudes and traditions that have not changes at the same speed as on the legislative level.

Following this detailed comparison of particular lexical bundles in the published and student corpora, the focus now shifts to a comparison of the use of bundles by different student groups.

4.3.5.2 Comparison of lexical bundles in student corpora

In line with the hypotheses which provide the framework for this study, and following the method used in the qualitative study of academic vocabulary, the lexical bundles used by L1

and AL students were compared, as were those by the high and low achievers in each academic year. However, a keyness analysis of these sets of corpora reveals very few differences between the groups. The results of each keyness analysis are presented in Tables 4.45 to 4.47 below, with a brief discussion of each table.

Lexical bundle	Frequency in core corpus	% in core corpus	Normalised rate in core corpus	Frequency in ref. corpus	% in ref. corpus	Normalised rate in ref. corpus	Keyness value*
at the age of	106	0.009	8.98	68	0.004	3.58	36.26
as a result of	201	0.02	17.04	519	0.03	27.32	-34.38
as well as the	188	0.02	15.94	497	0.03	26.16	-35.84
it is evident that	44	0.004	3.73	179	0.009	9.42	-35.85
a South African context	117	0.01	9.92	370	0.02	19.48	-44.94

*Significant at $p < .0001$

Table 4.45⁵²: Lexical bundles in the AL student corpus with significantly different frequencies from those in the L1 (reference) corpus

It is difficult to account for the differences in the use of these bundles by additional and first-language students as none of them are linked to a particular assignment topic, although it would appear that the L1 students were more inclined to provide examples situated in the South African context. One possible inference regarding the use of the more generic bundles that may be drawn from this data is that L1 students are more likely to draw a link between cause and effect by means of the resultative function, as reflected in the underuse of *as a result of* by the AL students. This assumption is supported by the quantitative data presented in Table 4.25 (§4.3.2.3) which shows that the L1 corpus contains a higher proportion of resultative bundles than does the AL corpus. However, the same argument cannot be made for either *as well as the* or *it is evident that*, which perform transition and stance functions, respectively, since AL students use slightly more transition bundles on the whole, while there is little difference between the groups in the overall use of stance bundles.

Finally, as in the case of the academic vocabulary, none of the bundles used by the first-year students in the group of high achievers was significantly different from those used by the low achievers from the same cohort. As a result the discussion in this section focuses on lexical bundles from the second- and third-year corpora.

⁵² KEY to Table 4.45: Normalised rate calculated per 100 000 words; core corpus – AL (1 179 619 tokens); ref. = reference corpus – L1 (1 899 689 tokens)

A comparison of the lexical bundles used by the low and high achievers in the second-year cohort reflects very little difference between the groups, as presented in Table 4.46.

Lexical bundle	Frequency in core corpus	% in core corpus	Normalised rate in core corpus	Frequency in ref. corpus	% in ref. corpus	Normalised rate in ref. corpus	Keyness value*
we are able to	36	0.01	10.39	5	0.001	1.20	32.40

*Significant at $p < .0001$

Table 4.46⁵³: Lexical bundles in the PSY200 low achievers student corpus with significantly different frequencies from those in the PSY200 high achievers (reference) corpus

The overuse of *we are able to* by the low achievers in the second-year corpus again reflects an assertive style. Comparing the use of this bundle to that of a similar bundle in the published corpus, *we were able to* reveals notable differences.

. By keeping the two dimensions separate, moreover, *we were able to examine* empirically the extent to which factor analysis (available from the second author), *we were able to meet* the requirements of instrument unable to run a simulation on their actual stimuli. However, *we were able to select* a subset of the stimuli used in to college or work. By implementing a longitudinal design, *we were able to test* the effect of openness to experience

Figure 4.14: R1 collocations of *we were able to* in the published corpus

In the case of the published corpus, the bundle occurs only in the past simple tense as its use is restricted to reporting procedures followed in the course of conducting research. The plural pronoun *we* in this context therefore refers to the group of researchers. On the other hand, the bundle *we are able to*, as used by low achievers, is in the present simple tense. While the present simple tense in this context would typically indicate that what follows is a statement of fact, in this case the ‘private verbs’ (Quirk et al., 1985) which follow the bundle present the kind of inference that would normally require additional hedging within an academic argument.

excitation of neurons occurring in the visual cortex, *we are able to assume* that smaller segregated parts of off. Resilient in in all of us and with the right state of mind *we are able to change* our ways and become the best we looking at the two types of continuity and their definitions *we are able to conclude* that there is much contradiction the different types and a understanding of continuity itself *we are able to determine* how changes can simply be a

Figure 4.15: R1 collocations of *we are able to* in the PSY200 low achievers’ corpus

While this bundle is used in the same way by the high achievers in the second-year cohort, it is not only used to a considerably lesser extent, but also to refer more to practical applications rather than to deductions. This difference is illustrated in Figures 4.15 and 4.16.

⁵³ KEY to Table 4.46: Normalised rate calculated per 100 000 words; core corpus – PSY200 low achievers (346 437 tokens); ref. = reference corpus – PSY200 high achievers (415 415 tokens)

. It means that, with the rank-order consistency analysis, **we are able to discover** that one's personality features are adults in charge, such as teachers and psychologists. **We are able to mend** the building block that had been : "A vneclie epxledod at a plocie cehckipont in the ngiht." **We are able to read** the words correctly due to the and in some cases, divided attention. This is because **we are able to select** certain stimuli over others but it

Figure 4.16: R1 collocations of *we are able to* in the PSY200 high achievers' corpus

As with the comparison of bundles used by the low and high achievers in the second-year cohort, a keyness analysis of bundles used by these groups in the third year cohort reflects little real difference between the groups. The results of this analysis are presented below.

Lexical bundle	Frequency in core corpus	% in core corpus	Normalised rate in core corpus	Frequency in ref. corpus	% in ref. corpus	Normalised rate in ref. corpus	Keyness value*
of sense of comm.	30	0.008	8.01	0	—	0	50.38
the sense of comm.	20	0.005	5.34	0	—	0	33.58
a sense of comm.	40	0.01	10.67	8	0.002	1.62	32.96
as a result of	50	0.01	13.34	168	0.03	34.09	-39.17

*Significant at $p < .0001$

Table 4.47⁵⁴: Lexical bundles in the PSY300 low achievers student corpus with significantly different frequencies from those in the PSY300 high achievers (reference) corpus

As illustrated in the previous comparison of essay topics selected by low and high achievers (§4.2.5.3, Table 4.14), the essay on community psychology was selected by 49% of low achievers as opposed to the 11% from the high achievers group. This clearly accounts for the overuse of the three-word bundle *sense of community* by the low achievers within the third year, while the underuse of *as a result of* by this group is comparable to the underuse of the same bundle by the AL students (Table 4.45).

The more qualitative analysis of the lexical bundles overused and underused by various groups within the study has provided further insight into students' use of bundles. This relates less to differences between student groups than to differences between students and published writers, primarily in relation to students' use of particular bundles as "lexical teddy bears" (Hasselgren, 1994) and assertive versus persuasive writing styles.

Particular ways in which the students' use of bundles differed from that of the published writers' included the use of certain bundles for different functions, as found by Cortes (2004), examples of colloquial usage within an academic context such as *this is when the*, and idiosyncratic

⁵⁴ KEY to Table 4.47: sense of comm. = sense of community; Normalised rate calculated per 100 000 words; core corpus – PSY300 low achievers; (374 691 tokens); ref. = reference corpus – PSY300 high achievers (492 853 tokens)

usage such as *owing to the fact* and *with regards to the*. As noted above, although the latter is virtually non-existent in published academic writing, it appears to have become increasingly common in general writing and speech. It is therefore arguable as to whether it should still be regarded as idiosyncratic. Another example was the discrepancy in the positioning of bundles within a sentence, for instance, the placing of *when it comes to* as sentence-initial by published writers but as sentence-medial by students. One of the most notable findings, however, was the number of examples of both overuse and underuse of bundles by students relative to the published corpus. This finding provides further support for previous studies which have shown considerable overgeneralisation by students of a few, limited bundles (De Cock, 2000; Granger, 1998; Li and Schmitt, 2009). As a result of this overuse, one of the more unexpected findings was that there was relatively little difference between the student and published corpora in the proportion of noun- and preposition-based bundles, while the published corpus contained a higher proportion of verb-based bundles. This finding was surprising as it runs counter to Chen and Baker's (2010) observation that published writers use a higher proportion of noun- and preposition-based bundles, with fewer verb-based bundles than do students. It was accounted for, though, by the high frequency of inferential and causative bundles such as *it is important to* and *are more likely to* in the published corpus, and descriptive bundles such as *the way in which* and *in the case of* in the student corpus (§4.3.2.2).

As there was little difference between the AL and L1 students' use of bundles, there was insufficient evidence in this study to support the argument that additional language learners tend to overuse bundles to a considerably greater extent than first-language students, or that L1 students' use of structural types is more typical of mature writing, as hypothesised in HLB2b (§4.3.2.2). Similarly, there was little conclusive evidence to show that the overgeneralisation of bundles reduces from first year to third year, as proposed in HLB3a (§4.3.3.1). The results of this study were therefore not able to address questions regarding specific differences in the structures and functions of bundles used by L1 as opposed to AL students, or by high as opposed to low achievers. Recommendations for further research are presented in Chapter 5.

Arguably the most salient finding was the lack of hedging in students' writing as a result of the underuse of bundles typically employed to moderate arguments, such as *it is possible that*, *the degree to which* and *are more likely to*. In addition, a greater proportion of resultative bundles was found in the student corpus, with little evidence of modals and adverbs being used to indicate possibility. The result points to a more assertive style by the students, reinforced by the use of bundles such as *this will be done*, *this is evident in* and *this is because the* – none of which occurs in the published corpus. There is some evidence that the low achievers are

slightly more assertive than the high achievers, although in contrast to other studies (Ädel and Erman, 2011; Chen and Baker, 2010), this evidence is negligible.

Following on from the more qualitative orientation of this section, the next one concerns the interviews and tests conducted with the aim of providing additional insight into the results.

4.3.6 Discussion of interview data

Having obtained both quantitative and qualitative data on various aspects of academic vocabulary and lexical bundles, I conducted a series of interviews with volunteers from the group of third-year students. Of the 160 participants in the study, 19 volunteered in response to an email request (Appendix N). The aim of these interviews was to investigate the students' perceptions regarding their use of academic vocabulary and lexical bundles, and examine the effect of these variables on their grasp of the prescribed reading. In addition, the interview questions were designed to establish the context of each student's account of their university experiences, addressing broader issues such as the types of problems experienced when writing first-year essays.

4.3.6.1 Results and discussion of vocabulary tests

As explained in Chapter 3 (§3.5.2.4), the interview was preceded by three short vocabulary tests which included a repeat of the productive test of academic vocabulary initially conducted in 2012, and two sets of questions based on lexical bundles (Appendix O). As the cloze-test format was used for all three tests, these tests could be completed in less than 30 minutes. This section presents the results of these tests (Table 4.48), and a discussion of the correlations found between the interviewees' test results and their academic performance. Furthermore, given the benefits that derive from a prospective longitudinal study such as this, as opposed to a cross-sectional longitudinal study (Dörnyei, 2007:82-83), it was possible to examine aspects of the interviewees' use of lexical bundles over the course of their undergraduate degree.

Interviewee	L1/AL	Psychology essay averages			Vocabulary test results ⁵⁵				
		PSY100	PSY200	PSY300	AWL ⁵⁶ 2011	AWL 2012	AWL 2013	LB Test 1 ⁵⁷	LB Test 2 ⁵⁸
A	AL	68	58	61	—	86.7	80	84.4	45
B	L1	80	79	75	100	90.0	90	100	80
C	L1	82	87	78	100	88.3	96.7	87.5	75
D	L1	69	73	76	100	76.7	81.7	56.2	50
E	L1	77	86	74	100	90.0	93.3	81.2	35
F	AL	64	67	66	96.7	40.0	83.3	62.5	75
G	L1	73	78	74	100	76.7	93.3	68.7	60
H	L1	76	65	63	83.3	63.3	65.0	46.9	55
I	L1	64	73	72	100	—	76.7	87.5	80
J	L1	68	66	70	100	76.7	70.0	81.2	75
K	AL	79	71	73	100	—	86.7	68.7	45
L	L1	71	73	68	96.7	—	86.7	62.5	55
M	AL	65	57	56	76.7	15.0	50.0	31.2	50
N	AL	77	67	70	—	76.7	83.3	68.7	50
O	L1	76	70	71	—	65.0	71.7	81.2	50
P	AL	68	68	66	96.7	75.0	86.7	81.2	85
Q	AL	70	66	63	100	56.7	73.3	62.5	45
R	L1	73	70	71	96.7	—	75.0	78.1	60
S	L1	74	63	75	—	76.7	90	87.5	90

Table 4.48: Interviewees' language status, average essay results and vocabulary test results

Two Pearson correlations were conducted to determine the relationship between the results of the vocabulary tests and the students' academic performance. The first looked at the results of the productive academic vocabulary test given to students in their second year (2012) and again in their third year (2013) in relation to the average essay results for the third year. Tables 4.49a and 4.49b below present the correlation results for the 15 interviewees who completed both 2012 and 2013 vocabulary tests.

⁵⁵ Vocabulary results are given as a percentage

⁵⁶ Academic vocabulary

⁵⁷ Participants required to identify the appropriate lexical bundle to complete a sentence

⁵⁸ Participants required to correct mistakes in a number of lexical bundles given in context

Vocabulary test	<i>n</i>	Mean	SD
Academic vocabulary 2012	15	70.23	20.41
Academic vocabulary 2013	15	80.55	12.64
PSY300 essay averages	15	69.20	6.44

Table 4.49a: Descriptive statistics for the productive academic vocabulary test completed in 2012 and in 2013

n = 15		AWL test 2012	AWL test 2013	PSY300 average
AWL test 2012	Pearson Correlation (<i>r</i>)	1	.750**	.698**
	Sig. (2-tailed)		.001	.004
AWL test 2013	Pearson Correlation (<i>r</i>)	.750**	1	.773**
	Sig. (2-tailed)	.001		.001
PSY300 average	Pearson Correlation (<i>r</i>)	.698**	.773**	1
	Sig. (2-tailed)	.004	.001	

** . Correlation is significant at the 0.01 level (2-tailed).

Table 4.49b: Correlations for the productive academic vocabulary tests and essay averages for the third year

Table 4.49: Correlation results for the productive academic vocabulary tests and essay averages for the third year

These results show a high correlation (Mulder, 1982) between both sets of results for the academic vocabulary test and the measure of academic performance. The mean reflects that the group of interviewees who repeated this vocabulary test performed better overall in 2013, as may be expected given that the 2012 test was conducted at the start of their second year, while the 2013 test was conducted at the end of their third year. Although the impact on the student of repeating the same test must be recognised, the improvement in test results nevertheless provides a degree of support for the vocabulary and academic year hypothesis. It may therefore be argued that these results validate the assumption that students develop their academic vocabulary over the course of their undergraduate studies. It is also clear from these results that there is a stronger relationship between the 2013 vocabulary test results and the third year essay results. This suggests that, although the productive form of the academic vocabulary test may correlate strongly with academic performance, the predictive value of this test is likely to be weaker in the second year than in the third year. However, further research is required to test this assumption as these results are based on a very small sample, and do not include first-year students.

The second Pearson correlation examined the relationship between the 2013 productive academic vocabulary test and the two lexical bundle tests completed by all interviewees, and their third year essay results, as presented in Tables 4.50a and 4.50b.

Vocabulary test	n	Mean	SD
Academic vocabulary 2013	19	80.71	11.44
Lexical bundle Test 1	19	72.51	16.46
Lexical bundle Test 2	19	61.05	16.21
PSY300 essay averages	19	69.58	5.80

Table 4.50a: Descriptive statistics for the academic vocabulary and lexical bundle test results, and essay averages for the third year

n = 19		AWL test 2013	LB Test 1	LB Test 2	PSY300 average
AWL test 2013	Pearson Correlation (<i>r</i>)	1	.615**	.233	.733**
	Sig. (2-tailed)		.005	.336	.000
LB Test 1	Pearson Correlation (<i>r</i>)	.615**	1	.466*	.601**
	Sig. (2-tailed)	.005		.044	.006
LB Test 2	Pearson Correlation (<i>r</i>)	.233	.466*	1	.277
	Sig. (2-tailed)	.336	.044		.251
PSY300 average	Pearson Correlation (<i>r</i>)	.733**	.601**	.277	1
	Sig. (2-tailed)	.000	.006	.251	

** . Correlation is significant at the 0.01 level (2-tailed). * . Correlation is significant at the 0.05 level (2-tailed).

Table 4.50b: Correlations indicating the relationship between the academic vocabulary and lexical bundle test results, and the essay averages for the third year

Table 4.50: Correlations between the academic vocabulary and lexical bundle test results, and the essay averages for the third year

The mean of each lexical bundle test shows that the students performed better overall in the first test. This test required participants to complete sentences with the most suitable bundles selected from a number of options. The majority had little problem with those bundles which occur with high frequency in the student corpus, such as *one of the most*, *the way in which* and *when it comes to*. However, those bundles which occur less frequently in the student corpus such as *on the basis of*, *in the context of* and *to the extent that* tended to present the students with greater difficulty, as illustrated in Table 4.51. In this case, the particularly low score for the bundle *in the context of* and relatively low score for *on the basis of* may be accounted for in terms of Nekrasova's (2009) findings. She argues that text-oriented or 'discourse-organising' bundles are more salient as they are used to link larger pieces of text. As a result they are more easily recognised and so more easily remembered than the research-oriented or 'referential' bundles which link phrases or sentences. Furthermore, Nekrasova claims that the structural nature of these bundles makes the 'fixed' form of text-oriented bundles such as *one of the most* easier to recall than the open frame of research-oriented bundles such as *the size of the*, *the end of the*, *the rest of the* and *the role of the*:

... the strength of association of a specific frame with a particular lexical bundle might be higher for discourse organizers than for referential bundles, which would make the former more salient and easier to retrieve than the latter.

(Nekrasova, 2009:674)

However, as these results are based on a small sample, there is little clear evidence to support Nekrasova's theory. For this reason, in addition to the apparent link between frequency of occurrence and performance on that test item, alternative possible explanations for the variations in results are presented.

LB Test 1 - items	Required lexical bundle	Keyness in student corpus ⁵⁹	Percentage of correct answers
B1	on the basis of	-289.92	63.16%
B2	as a result of	287.71	60.53%
B3	in the face of	—	73.68%
B4	in the context of	-101.33	21.05%
B5	in the absence of	-68.34	89.47%
B6	in the sense that	34.80	73.68%
B7	the nature of the	-65.27	84.21%
B8	one of the most	30.64	94.74%
C1	to the extent that	-47.20	60.53%
C2	as part of the	—	57.89%
C3	are less likely to	—	100%
C4	the way in which	315.60	100%
C5	when it comes to	156.79	78.95%
C6	it is important to	—	86.84%
C7	as well as the	149.26	68.42%
C8	on the other hand	—	47.37%

Table 4.51: Keyness and percentage of correct answers per item in Lexical bundle Test 1

It is important to note that other variables, such as the context of the cloze question, are likely to have impacted on the degree of difficulty experienced by the students in completing this test. For example, the context of the sentence in C3 may be regarded as providing considerably more guidance than in C8, as illustrated in the following extracts.

C3: Previous research has shown that European American teens _____ be the target of ethnic bias than are African American or Latino teens. [are less likely to]

⁵⁹ Keyness value based on student corpus as the core corpus, with published corpus as the reference corpus; blank entries (—) indicate no significant difference in frequency between the student and published corpora

C8: In line with theory and research, one might expect women to be more extroverted than men. _____, extroversion is related to greater sexual promiscuity, which should be more adaptive for men than for women according to evolutionary theories. [on the other hand]

Similarly, 89% of students were able to identify the correct lexical bundle required in B5, despite the extent to which it is generally underused in student essays, while the far more commonly used bundle *as a result of* (B2) was only correctly identified in 60% of cases. The context for each lexical bundle is illustrated below:

B5: Human society does not function well _____ a sense of moral purpose and a cooperative stance toward others. [in the absence of]

B2: For those young people who flee to new cultures and countries _____ conflict or disaster, acculturation and language skills have been linked to better adaptation over time. [as a result of]

As most of the sentences used in the test were taken directly from published articles, it was essential for the validity of the test that these sentences were not adapted but were representative of the texts which students are required to read for their essays. The results of this matching test suggest that, for a number of students, context plays a key role in their ability to identify the bundle most suited to the sentence. For example, although it seems likely that the majority of students understand the function of overused bundles such as *as a result of* (§4.3.5.1), it would appear that some of the weaker students are not always able to identify the circumstances in which a causative link is required. This ties in with the finding that both additional language students and low achievers significantly underused this bundle (§4.3.5.2, Tables 4.45 and 4.47).

The second lexical bundle test was intended to test students' degree of familiarity with the form of lexical bundles. For each of the ten test items, students were required to provide the correct form of the phrase given (Appendix O). An analysis of the results is presented in Table 4.52.

LB Test 2 - items	Required lexical bundle	Keyness in student corpus ⁶⁰	Percentage of correct answers
D1	for the purpose of	—	76.32%
D2	the course of the	—	50.00%
D3	at the same time	—	84.21%
D4	in terms of the	—	94.74%
D5	with respect to the	-49.97	60.53%
D6	in the form of	30.16	47.37%
D7	on the one hand	-24.04	71.05%
D8	as a function of	-123.08	39.47%
D9	the degree to which	-70.03	13.16%
D10	to be associated with	-41.32	78.95%

Table 4.52: Keyness and percentage of correct answers per item in Lexical bundle Test 2

These results indicate that very few students had problems with bundles which occur commonly in both student and published corpora such as *at the same time* and *in terms of the*. As with the first bundle test, a number of students struggled with bundles with a negative keyness value (*as a function of* and *the degree to which*). This is to be expected as the keyness shows that these bundles are underused by the students, possibly reflecting a degree of unfamiliarity with the way in which the bundle is used. This concurs with Durrant and Schmitt's (2009:174-175) argument that students tend to "repeat favoured items" while underusing those that occur less frequently: "learners are quick to pick up highly frequent collocations, but less common ... items take longer to acquire".

Again, it is likely that the context of the sentence affected the students' ability to determine the correct answer in some cases. Despite the fact that the required lexical bundle in the extract below (*in the form of*) is overused by students relative to its use by published writers, those not familiar with the terms 'concurrency' and/or 'polygamous' may have been uncertain as to what bundle was required following this term.

D6: One of the dimensions of openness about sex and sexuality is an acceptance that over the course of a lifetime most people will have multiple sexual partners. Concurrency has a special place in traditional African society *in the shape of polygamous marriage, but the practice clearly extends well beyond marriage. [in the form of]

⁶⁰ Keyness value based on student corpus as the core corpus, with published corpus as the reference corpus

An additional point with regard to these results is that, although students underuse many of the bundles, they appear to be familiar with the correct form in some cases. Examples from this test include *with respect to the*, *on the one hand* and *to be associated with*. The students' ability to provide the correct form of these bundles suggests that they may be part of their receptive vocabulary (Schmitt, 2010:80), and are more likely to be produced by the high achievers than by the low achievers. This assumption was tested by analyzing the use of bundles with a negative keyness value by high and low achievers. The bundles in this analysis were based on those given as test items in the lexical bundles tests (Tables 4.52 and 4.53). It may be argued from the significant degree of underuse that those students who are able to use these bundles correctly, even if only to a limited extent, are likely to have a slightly better grasp of which bundles are appropriate to the academic context. Following this argument, it may be expected that students who use these bundles generally perform better academically. The use of these bundles in individual essays was therefore scrutinised to determine the possibility of a relationship between the number of bundles used from this category, and students' academic performance. Table 4.53 below presents the high and low achievers' use of these bundles.

Interviewee	PSY300 average %	Lexical bundle	Academic year	Frequency	LB types	LB tokens
C	78	the degree to which	2011, 2013	3	3	5
		to the extent that	2011	1		
		in the absence of	2012	1		
D	76	—	—	0	0	0
B	75	the degree to which	2012	2	4	5
		in the context of	2011	1		
		in the absence of	2013	1		
		on the basis of	2013	1		
S	75	the degree to which	2011, 2012	2	4	5
		in the absence of	2011	1		
		with respect to the	2011	1		
		the nature of the	2013	1		
E	74	in the context of	2011	1	3	3
		on the basis of	2013	1		
		to the extent that	2013	1		
G	74	on the basis of	2013	1	1	1
K	73	on the one hand	2011	1	2	5
		in the context of	2011, 2013	4		

Interviewee	PSY300 average %	Lexical bundle	Academic year	Frequency	LB types	LB tokens
I	72	—	—	0	0	0
H	63	the degree to which	2012, 2013	2	3	4
		on the basis of	2013	1		
		to the extent that	2013	1		
Q	63	—	—	0	0	0
A	61	in the context of	2012	1	1	1
M	56	—	—	0	0	0

Table 4.53: Lexical bundles with negative keyness used by high and low achievers listed in order of essay averages for PSY300

Although it must be recognised that this analysis was conducted on an extremely small sample, it is possible to detect a pattern in that the high achievers generally tend to use a greater number of those bundles in the test which have a negative keyness value, as evident in the 'LB tokens' column. Of even more interest is the greater range of types used by the high achievers. The more restricted range used by the low achievers ties in with findings that students tend to rely on a few, familiar lexical items, to the extent that these are overused in favour of other lexical items that would be more appropriate to the context (Durrant and Schmitt, 2009; Li and Schmitt, 2009). The overuse of a limited number of lexical items has been shown in previous research to extend to lexical bundles (Chen and Baker, 2010; Cortes, 2004; Hyland, 2008a).

To conclude the discussion of the vocabulary and bundle tests with reference to Table 4.50b, while there is, as in the overall findings, a high correlation between academic vocabulary and academic performance, as measured by the third year essay results ($r = .733, p < 0.01$), there is also a strong relationship between the first of the lexical bundle tests and the essay results ($r = .601, p < 0.01$). There is no correlation, however, between the second lexical bundle test and academic performance. As suggested earlier, this may be due to the difference in test formats which creates opportunities for guesswork in the first test, thereby enabling students to make use of receptive knowledge, that is, bundles which are recognised but not normally used. This lack of correlation may be accounted for in part by the number of test items. While the first bundle test contained 16 items, the second contained only 10, a factor that reduces the chances of significant findings, and makes it more difficult to compare the results of the two bundle tests.

4.3.6.2 Analysis of individual corpora

Before moving on to the discussion of the interview questions, the analysis of individual students' use of lexical bundles is discussed. In order to analyse the bundles used by each student, his or her essays for each academic year were grouped into a single corpus. This division allowed for the comparison of lexical bundles across first-, second- and third-year texts. Each student's use of bundles from the published corpus was then counted. This count included both target bundles and all those that are not context- or topic-specific such as *studies have found that*, *in addition to this*, *as a measure of* and *in line with the*. The bundles identified for discussion had a minimum frequency of three, and were not only from the published corpus but were also those regarded as particularly apposite to the academic context on the grounds that they reflect features such as low-frequency vocabulary and the use of hedging devices, as illustrated by the examples below. In addition, bundles that were either incorrectly formed or inappropriate to the context of the sentence were examined and briefly discussed.

The student with the highest mark in the group of interviewees (78%) used a number of bundles common to the published corpus such as *the extent to which*, *the way in which*, *studies have found that* and *with regard to the*. Notable bundles that were not in the published corpus included *it is pertinent to*, *one needs to gain*, *one school of thought* and *in an attempt to*. These reflect the use of low-frequency vocabulary, idiomatic expression and hedging, respectively, all of which may be argued to be more characteristic of high achievers (Ädel and Erman, 2012; Chen and Baker, 2012; Cobb and Horst, 2001; Coxhead and Nation, 2001; Hyland and Milton, 1997; Nagy and Townsend, 2012; Qian, 2002; Scheepers, 2014; Wray, 2000).

Those students who obtained an average of between 76% and 72% for their third year essays used bundles from the published corpus such as *take into account the*, *can be attributed to*, *despite the fact that*, *may prove to be*, *may be able to* and *more likely to be*, which seem to reflect both cross-referencing and a degree of hedging. However, these students did not use substantially more bundles from the published corpus than the poorer achievers. It has therefore not been possible on the basis of the in-depth analysis of the interviewees' writing to establish a pattern in the use of the published lexical bundles by students at different levels of academic proficiency. To establish more clearly which target bundles are used by the high and low achievers would require detailed analysis of a far broader range of individual students' lexical bundle usage, an approach which is beyond the scope of the present study.

The interviewees in the 76% to 72% group made use of bundles that suggest a fairly strong degree of assertiveness rather than hedging such as *it is evident that* and *it is obvious that*, as

well as bundles that reflect colloquial usage within the academic context such as *when it comes to*, *more often than not* and *this is when the* (with reference to various stages in the development of personality). The increasingly common bundle *with regards to* was used by four of the seven students in this group. The lexical bundles used by the only additional language speaker in the group of high achievers suggest a degree of difficulty with the form of bundles not experienced by the first language students. This includes the use of the incorrect preposition in the bundles **the degree in which* [gradual change occurs] and **in regards to the* [materials they have just read]. The following two extracts from essays written by this student similarly reflect a poor grasp of the semantic rules governing certain bundles:

- a. **On the basis of* different surnames, particularly using the maternal surname, male adolescents have constantly found themselves in an identity crisis of not knowing their paternal side which they feel largely to constitute their identity.
- b. The left hemisphere and the right hemisphere are asymmetrical and this is understandable because they both differ in the type of information they process and **the nature of which* they process it.

While *on the basis of* refers to “the most important facts, ideas, etc. from which something is developed” (Cambridge International Dictionary of English, 1995), *as a result of* provides a causative function, illustrating the reason for something. A more appropriate bundle in the context of the first extract (a) would therefore be *as a result of*. This idiosyncratic form serves to reinforce the finding that additional language students tend to underuse this bundle (§4.3.5.2, Table 4.45). The bundle *the nature of which* in (b) is semantically inappropriate as *the way in which* would be more suited to the context.

The lexical bundles used by the low achievers who obtained between 63% and 56% contained a variety of bundles from the published corpus, many of which served a reporting function, such as *is considered to be*, *is defined as a* and *it is suggested that*. In addition to evidence that the idiosyncratic form **in regards to the* as well as the more common *with regards to* were used by this group, there are generally more instances of idiosyncratic bundles than in the high achievers’ group. The following extracts serve to illustrate some of these cases:

- c. **In this context of* single fathers and single mothers have no gender differences in the level of work to family conflict or workload.
- d. Contento suggest that it is important for Health Psychology to gain insight **of the nature of* attitudes and beliefs, their formation and how they might be change.

- e. Learning-based treatments use principles of learning and even provide rewards for appropriate eating and weight gain, but again, it is not possible to conclude that these are effective *due to absence of controlled research.

Extract (c) appears to be an approximation of the lexical bundle *in the context of*, although the phrase *in this context* would be more suitable here. Extract (d) is another example of the incorrect preposition being used as the syntactic rules governing *insight* require that it is followed by the preposition *into*, while the idiosyncrasy in (e) derives from the omission of the definite article from the bundle *due to the absence of*.

The following concordance lines illustrate a construction that is particular to the student corpus, and is used by only two students, one of whom was in the group of low achievers who were interviewed. In this example the definition of a term is signalled by the use of the bundle *it is meant that*:

while bulimia nervosa is ego-dystonic. By **ego-syntonic**, **it is meant that** one takes this to be a part of them and by themselves and macro forces. By macro **forces**, **it is meant that** the political sphere whose mandate in differently to critical psychology. By **mainstream**, **it is meant that** the other spheres of psychology that do a way of social control and is not value-free. By **value-free**, **it is meant that** there are no societal values attached to

Figure 4.17: L1 collocations of *it is meant that* in a third-year corpus

Finally, as noted previously (§4.3.5.1), where published writers use complex adjectives such as *central*, *critical*, *integral*, *pivotal*, *prominent* and *significant* to describe the noun *role*, one of the low achievers in this group made frequent use of the bundle *a big role in*, relying on the base form of the adjective rather than a more specific alternative.

Another aspect considered was the interviewees' use of bundles across first-, second- and third-year essays. As with the analysis of the total number of bundles in each student's complete corpus of psychology essays for their undergraduate degree, only those bundles which had a minimum frequency of three were counted, as illustrated in the table below.

Interviewee	L1/AL	PSY300 essay average	PSY100			PSY200			PSY300		
			Total no. of words in essays	Target LBs – types & tokens	No. of LB tokens per 1000 words	Total no. of words in essays	Target LBs – types & tokens	No. of LB tokens per 1000 words	Total no. of words in essays	Target LBs – types & tokens	No. of LB tokens per 1000 words
C	L1	78	6137	2 (15)	2.44	*6818	1 (18)	2.64	8474	3 (17)	2.0
D	L1	76	3133	0 (0)	0	6219	2 (9)	1.45	6718	2 (9)	1.34
B	L1	75	3792	0 (0)	0	8151	3 (12)	1.47	*5720	1 (3)	0.52
S	L1	75	3807	1 (3)	0.79	7431	5 (22)	2.96	8350	3 (15)	1.8
E	L1	74	3522	0 (0)	0	7479	1 (3)	0.4	8261	0 (0)	0
G	L1	74	3619	3 (11)	3.04	7767	6 (40)	5.15	11 342	6 (51)	4.5
K	AL	73	3531	0 (0)	0	7141	1 (7)	0.98	9178	5 (24)	2.61
I	L1	72	2790	0 (0)	0	6416	1 (6)	0.94	7378	4 (18)	2.44
O	L1	71	4007	1 (3)	0.75	9384	1 (3)	0.32	9689	7 (27)	2.79
R	L1	71	4658	0 (0)	0	8407	2 (6)	0.71	*9819	2 (8)	0.81
J	L1	70	3324	0 (0)	0	4989	2 (6)	1.20	6155	3 (11)	1.79
N	AL	70	3694	0 (0)	0	6576	1 (4)	0.61	8060	3 (10)	1.24
L	L1	68	4096	2 (6)	1.46	8583	8 (44)	5.13	11 018	6 (35)	3.18
F	L1	66	3876	1 (3)	0.77	8094	4 (13)	1.61	7608	5 (20)	2.63
P	AL	66	4475	0 (0)	0	7555	3 (11)	1.46	10 720	4 (14)	1.31
H	L1	63	4464	1 (3)	0.67	7511	3 (9)	1.2	9198	2 (5)	0.54
Q	AL	63	3221	0 (0)	0	*6044	1 (3)	0.5	10 827	5 (44)	4.06
A	AL	61	3190	0 (0)	0	4768	1 (3)	0.63	*5099	1 (5)	0.98
M	AL	56	3381	0 (0)	0	*5874	1 (3)	0.51	8738	3 (18)	2.06

* Only three of the four psychology essays due for the academic year were submitted

Table 4.54: Total number of bundles and target bundles in first-, second- and third-year interviewees' corpora

The total number of words in the essays submitted for each academic year was included in order to provide a framework in terms of which the number of target bundles could be assessed. The proportion of bundles per 1000 words was then calculated for each year, and the highest proportion highlighted in bold. While these proportions illustrate an increased use in target bundles after the first year, there is no clear pattern distinguishing the frequency of use by the second- and third-year students in this group. It is worth noting, however, that the greater increase of bundle use by top achievers occurs in their second year, while the middle and lower group increase bundle use more notably in their third year.

The results of the frequency count of target bundles show an overall increase in the number of bundles used by the interviewees from first year to third year, with the exception of one student who did not use any target bundles in either the first or the third year (Table 4.54: Interviewee E). The descriptive statistics for the third year essay results and the number of target bundles, assessed in terms of both types and tokens, are presented in Table 4.55. The means show that, in addition to a gradual increase in the number of types from first year to third year, there is a dramatic increase in the number of tokens, particularly from first year to second year. This finding supports the bundles (density) and academic year hypothesis (§4.3.3.1) which showed a significant increase in the density of bundles used by third-year students in relation to first years. This in-depth analysis has served to support the previous findings, and show that these differences are reflected in the types of bundles used as well as the tokens.

	n	Minimum	Maximum	Mean	Std. Deviation
PSY300 essay average	19	56	78	69.58	5.796
PSY100 - number of TB types	19	0	3	.58	.902
PSY100 - number of TB tokens	19	0	15	2.32	4.191
PSY200 - number of TB types	19	1	8	2.47	2.010
PSY200 - number of TB tokens	19	3	44	11.68	11.935
PSY300 - number of TB types	19	0	7	3.42	1.895
PSY300 - number of TB tokens	19	0	51	17.32	14.000

Table 4.55: Mean and standard deviations for the occurrence of target bundles in first-, second- and third-year interviewees' corpora

While there was no clear evidence from this small sample that high achievers use a greater number of target bundles, they were found to use a greater number and range of bundles with a high negative keyness value in the student corpus. This suggests that high achievers more closely approximate the use of bundles that occur with significantly higher frequency in the published corpus. A further finding was that bundles which may be regarded as idiosyncratic, non-standard or erroneous are found more frequently in the essays of the low achievers. Analysis of the use of bundles by first-, second- and third-year students showed a considerable increase in the mean use of both types and tokens of bundles from first year to third year, with significant evidence that the pattern of bundle usage by individual students tends to be maintained over the course of their undergraduate degree.

The interview questions are discussed in the next section. These are dealt with according to themes elicited in the course of the interviews. As the themes are interlinked, they are discussed within a single section.

4.3.6.3 Discussion of themes

The themes which were highlighted in the course of the interviews are discussed in this section in light of the quantitative results. The main themes include students' perceptions on reading and writing within the university context, academic support, the prescribed reading material, academic vocabulary and lexical bundles, and personal growth. Those who volunteered for the interviews were asked a series of questions designed to elicit additional information on these themes (§3.5.2.4 and Appendix O).

The majority of interviewees found academic writing difficult in the first year as the expectations were considerably higher than those in high school. This was highlighted by students who said they had performed extremely well in high school, but had obtained far lower marks for their first essays at university as a result of the shift in expectations. They had struggled particularly with the structure of the essay rather than the content, specifically the referencing technique required and the phrasing of the argument. The exceptions were a more mature student who had attended university only after working for a few years, and had obtained the highest mark in the group of participants, and a student who had registered for first year philosophy, and so had been taught logic, critical thinking and how to support an argument. The philosophy department had also provided explicit guidance on what to include in an essay.

The students generally felt that their writing had been positively influenced by both the quality and quantity of reading done over the course. Journal articles in particular were regarded by the high achievers in the group as a model of good academic writing, with one student describing articles as "well structured ... precise ... and concise". In contrast to this, another student claimed that articles had had a detrimental effect on his writing in second year as he had lost clarity in the attempt to emulate the writing style, and had had to make an effort to simplify his writing in third year. In line with this feedback, a pattern emerged as students who had obtained an average of 70% or more for their third year essays generally felt that reading articles had contributed to their writing, while those who had obtained marks in the 50s or 60s tended to struggle with journal articles, finding them difficult to understand and thus preferring textbooks. This impression comes through clearly in the following extract taken from the interview with the student who obtained the lowest mark in the group:

M⁶¹: Well, journals are very tricky for us student ... like, cause I think some of them are really translated and it's a direct translation, you can't even make sense what they're saying, and uh you read the first page and you realise 'oh, well, I don't think this is useful', rather a textbook cause a textbook has chapters, so you know you going to this chapter, you gonna find more stuff and they gonna use examples, in a journal there ain't any like examples ... and they don't really help you to understand, so I read more textbook than journals.

Rather than reading, this student felt that her writing had been influenced by the language used when texting, providing the example of 'u' instead of 'you'. Many of the students for whom English was not a mother tongue were strongly aware of their status as second language speakers, and felt that they would benefit from more academic support. While the feedback on the tutorials was mixed, the general consensus was that more guidance should be provided on academic writing, with a few students expressing the opinion that tutors and lecturers should be available to provide individual feedback on essays. In answer to the question of what recommendations could be made to the psychology department to provide additional support for first years, four of the students stressed the perceived lack of accessibility to lecturers:

K: Hmm ... I think the lecturers because the tutors, some tutors really don't have time to be like on an individual basis, they just like it's a class and if you don't understand it that's it, then you lost ... I think if it was on a one-to-one and you could also approach the lecturers that would also be helpful because I found that a lot of first year students ... yeah, were struggling a lot and they'd complain about not being able to approach the lecturer, they'd still be lost, even after feedback they'd still be lost ... they still wouldn't be able to understand the content and stuff like that

TC⁶²: Didn't the lecturers have consultation times?

K: Yeah, they do but I don't think students use those

TC: Okay, they feel ... that they can't?

K: Probably, maybe it's intimidating

R: ... there's some of the lecturers weren't so available ...

TC: Did you find the feedback from um ... that was given to you in psychology assignments helpful?

O: Never, never, never, never as efficient as it could be ... it didn't help me in the sense of I would have actually liked to have sat with someone ... and gone through the essay, and they

⁶¹ Letters of the alphabet have been used to identify interviewees in order to ensure their anonymity. Details of each interviewee such as language background, third-year essay average and number of target bundles used are provided in Table 4.48.

⁶² TC are my own initials, and so indicate questions which I posed as interviewer

stop and say 'why did you write that?', and I could go 'okay, well this is what I was thinking'. ... I personally would have liked to actually have been able to sit with the marker.

TC: Do you find that the feedback that you get from your lecturers is helpful?

P: Er ... I could say so ... um ... it's very much in detail ... but because they do not really encourage one-one-one, you would just stick to what you get, even if you not satisfied but ... because again it comes to the fact that I'm ... it's not my first language ... even when they correct me sometimes I don't see it, you know [okay] ... but if maybe they sat down with me and showed me the right way to write it, I would see.

Although none of the students who had consulted the writing centre found that it was helpful, only one had made use of the lecturers' consultation times to seek advice on how to write a first-year essay. One of the high achievers acknowledged that she hadn't made enough use of the consultation times, and said she would advise first years to consult with their lecturers when they're given the chance to do so.

The main recommendation proposed by students was that the psychology department should provide concrete examples of good and poor essays. The reason for this suggestion is summed up in the extract below.

E: But I think what they could also do which might be helpful is to circulate an example of an excellently written and referenced essay, and an example of a poorly referenced and written essay, ... you know they say ... 'make sure your introduction talks about all the points that you're going to come out with and your conclusion sums up all your main arguments' and so on, but they don't give you an example of someone who did that really well, they just tell you that you must do it, not how to do it.

Similarly, another student recommended a writing course that provides guidelines on how to write essays, focusing again on the structure and how to paraphrase. Most of those interviewed felt that the referencing booklet provided by the psychology department had served to resolve questions on referencing, particularly in conjunction with Internet sites on the APA referencing system. The main difficulty experienced with referencing was that different departments use different referencing systems, with the result that one of the main challenges at first-year level is to determine how the various referencing systems differ and when each is required.

While all students expressed the view that textbooks were more accessible than journal articles as they provide information at a more "basic level", and so are easier to read, the majority felt

that articles were more important at second- and third-year levels as they provide more detail and present different arguments on a topic.

N: I think a first year textbook for psych is critical. It's very important but it has to be in connection with the reading packs they hand out ... um ... you have to start reading on a very basic level the journal articles in first year but in connection with the textbook as the textbook is going to guide you on the basic ideas and once you understand the basics you can then translate that into the journal that you're reading ... the article that you're reading ...

TC: You find textbooks are still useful in third year?

D: Very useful, ja ... I find that textbooks sort of give you the ... um ... basic ... [okay] the basis of it and then journal articles will give you a little bit more, people doing extra things, maybe ... looking at it in a different light, so I find textbooks are useful if I just want the basics and then I can always expand on it with journal articles

J: Yes, I'd like to say also because when you look at a text book it's kind of very ... it's more straightforward, I find, so, you know, they giving you the points in point form or ... um, a little bit of ... I just find that journal articles are more elaborate and you kind of ... I don't know, you kind of are given the opportunity to reflect on what's being written in a journal article whereas in a text book it's kind of saying 'these are the facts, this is right', it's a text book [yes], whereas a journal article it's kind of 'I'm writing from my perspective, this is what my findings are, but ...'

The only student who did not find articles challenging to read was the top performer. The remainder regarded the language of articles as "academic" and "written for peers, not students", therefore requiring a base of considerable expertise. They generally focused on the introduction, discussion and conclusion, skimming the methodology and results sections as they struggled to understand the statistical jargon, despite completing a research and design course in their second year.

TC: Were there aspects of journal articles that you found difficult to read?

P: Yes, er ... because most of them were not written for students, they were written for peers in the field, so you'd have to look up every word in the dictionary, really ... but, ja, when you get the hang of it ... it also depends on the author because if their writing style is enjoyable you make the effort to look up the words, but if it's boring you just don't read it at all.

TC: What do you find particularly difficult about journal articles? Or what *did* you find ... do you find them easier now?

J: Well, no, I still do ... um, obviously the jargon that they use ... I mean because it's aimed at people who are assumed to know ... and if you don't understand it, it's ... then you kind of thrown in the deep there. And also because they use a lot of technicalities like um what type of

research they using and how they analysed the data and that ... you kind of just think 'well, what are they going on about?' and you kind of skim over all of that just so you can get to the discussion or the conclusion [yes] ... so I find that sometimes a bit difficult to understand. And just the way sometimes it is aimed at ... a higher, like academic audience [yes], so just like even the grammar that they use or the way that they write it sometimes is very complex and you just think 'I have no idea what is going on'. But also due to like time constraints you kind of skip over the methodology cause you just want to know what's like the basic crux of the journal article.

In contrast to the difficulties experienced with statistical jargon, most students had few problems with the vocabulary used in the reading material. Those interviewed generally found the reading material easier as they progressed from first year to third year, and believed that their vocabulary had expanded over the course of their undergraduate degree. This development was attributed to the use of dictionaries, exposure to the literature and, in two cases, to attending lectures.

D: My vocabulary has grown, it's become more published, more um academic ... maybe through constant exposure to the literature ... um ... maybe even speaking to lecturers, picking up on their vocabulary.

One of the students recognised that words change their meaning according to the context, while another said she was careful to avoid using words she didn't understand when writing essays. Most of the students interviewed consulted a dictionary when they encountered an unknown word in the reading material.

Questions regarding their use of lexical bundles (referred to as 'phrases' in the interviews) were put to the students following the completion of the lexical bundle tests. In order to explain lexical bundles, I referred back to the tests, and provided examples such as *on the other hand* and *as a result of*. Fifteen of the 19 interviewees were not consciously aware of using bundles. Two who claimed that they made use of phrases could only provide as examples those that I had given in my description of bundles, while the other two provided the following examples: *as you can see, this links to, as a consequence of, research has shown* and *there is evidence that*. Despite an average of 66% for the third year essays, the student who provided the last two examples obtained some of the highest marks for the lexical bundle tests (81% and 85% for Tests 1 and 2, respectively). She was the only student to express confidence in the use of bundles in the interview, and believed that her understanding had developed through reading and attending lectures.

The second student who was aware of using bundles recognised that journal articles made more extensive use of the “phrases” than she did, while the third believed that his use was restricted to a few, limited bundles, as illustrated in the extract below.

I: ... I'm aware of using them but I think I tend to stick to a certain few and shape my writing around those rather than having my writing shape which phrases I use. I think I just tend to ... not use them ... it's not because I don't want to use them, I just don't think about using them.

While the fourth student was aware of overusing certain “phrases”, and was making an effort to use a greater variety of the phrases in journal articles, this discussion focused on two- and three-word rather than four-word bundles.

TC: Are you aware of using phrases like ‘on the other hand’, ‘as well as the’, ‘as a result of’ and ‘in the case of’ in your writing?

O: I try to not ... like ... ‘as well as’ or ‘in terms of’ but, more specifically, ‘according to Smith’ ... they argue, kinda going ‘okay, I’m using ‘according to’ too much, I must find a different word’, so I eventually sat with ... the thesaurus and went ‘according’, type in, okay ... this one sounds good, let’s use that word ... and it feels like it still fits in context with the actual sentence itself, but um ... I was very aware of those ... [okay] and um ‘as well as’, I’m kinda going ‘as well as’, there has to be a better way of saying that ... ‘in terms of’ I felt like, cause that’s what I used the most ... the reader’s gonna get irritated with ‘in terms of’ in every second line so I was constantly trying to use it once and then maybe a little bit later use it again, and I don’t know how much that influenced ... if I’d just done a natural, my natural ... flow [hmm] and if I’d just stuck to that would that have made my writing better and more understandable ... And there are phrases that I use that occur in journal articles, and then there’s also phrases that occur in journal articles that I’ve started using.

While three of the students who used bundles believed that they were “formal”, and therefore suited to the academic register, one of the students regarded them as “more colloquial”. He argued that the less formal, less academic register of bundles made arguments easier to understand.

Two students regarded lexical bundles as linkers or connectors, apparently confusing them with adverbs such as *furthermore* and *moreover*, as was also found by Cortes (2009:399): “Students generally favoured simple conjunctions, conjuncts, and adverbs to express functions which published authors frequently convey by using lexical bundles.” A general perception was that bundles help the “flow of writing”, with one student stating that “phrases are used to avoid repetition”, while *with regard to* is used to change topic and *on the other hand* is used to

signal a change of argument. Although not consciously aware of using bundles, one of the students understood that *due to the fact* could only be followed by a particular grammatical construction, suggesting a partial awareness of the rules governing bundles.

[With reference to the placement of *due to the fact* in the first bundle test]

F: It makes sense ... it's in the right context ... Because if I saw for instance that phrase that I used ... if I were to use it I would say um '*due to the fact that*' a person has ... so I was looking through the words that have *that* at the end, then they don't ... they don't fit ... yes, they don't make sense.

It may be inferred from this that many of the lexical bundles are part of the students' receptive vocabulary. The mean result of the receptive lexical bundle test (B & C: 73%) seems to support this argument as it indicates a fairly good overall grasp of the context in which certain bundles are used. The finding that students generally struggle to come up with bundles unprompted links to Cortes' (2006) research in which bundles were explicitly taught, but without a significant impact on bundle production by students following this intensive period of instruction. However, the focused instruction had served to raise awareness of bundles.

In conclusion, 16 of the students interviewed believed that their writing had improved from first year to third year, as illustrated below.

L: ... there's no comparison to how I used to write back then and how I write now.

D: I'm definitely more confident in my writing ... it flows better, it comes more naturally ...

I: I've learnt to make my writing appropriate to who I'm targeting.

S: My writing's improved a lot since first year ... I think it has a lot to do with the amount, the volume of stuff we have to read in university ... that definitely plays a big role.

R: I'm proud of my writing now ... one of the first essays in the first year and I just didn't even understand it myself ... I'm writing this essay and I didn't even understand it myself ... and now I can understand what I'm writing.

G: I've learnt how to formalise my essays and to also just make them flow ... and also how to write longer essays ... and also sometimes just to make your essay to the point and to get your argument across.

Those students who were not confident about their writing felt that it had not improved. They believed that they needed more academic support, and that the psychology department should have provided clearer guidelines on what was expected from their essays. These opinions are reflected in the extracts below.

O: So first year, I was kind of like, whatever my mark was, I'm kind of okay, well, there's room for improvement cause there is ... but as it came to crunch time [in third year] I got more stressed out about assignments ... and then started doubting myself and questioning myself with almost every word I was doing.

TC: Do you think you've got a bit more confident?

F: Um ... no, I don't think that ... because it's the expectation that's the problem for me, so it's kinda like 'this is what we expect, how we expect you to write, this is what we expect you to say in your essays', and then this is where / (emphasis) am, and it's kinda like okay, well then how do I get here? Ja, that's the problem I've been facing.

M: I think I was improving my writing until ... I'm really bad at receiving feedback, I don't know how to deal with that ... until you write like a research proposal and it comes out with the really negative feedback and ... probably you should improve on it, then you like 'oh, I thought I was a great writer'.

The last extract, taken from the interview with the student who obtained the lowest results in the group, shows that she had been under the impression that her writing was improving until she received feedback on her research proposal. This overestimation of one's own ability is fairly common to weaker South African students (Coetzee-Van Rooy, 2011; Scheepers, 2014; Stephen, Welman and Jordaan, 2004). This student recommended that the psychology department assist first years with "integrating theory with practice". This statement, in conjunction with her relatively poor results in relation to the other students, suggests that she is battling with the conceptual work in the discipline and believes that, if it were made less abstract and more grounded in practice, she would find it easier to understand. This is a common misapprehension among weaker students who seem to think that theory can be divorced from practice, and that the practical aspects are all they require.

In addition to providing insight into the students' degree of awareness of lexical bundles, these interviews served to shed light on their general perceptions of vocabulary. Aside from the three who did not believe their writing had improved, the students' overall impression was that their academic vocabulary had increased and their writing skills had developed over the course of their undergraduate degree. This finding clearly supports the premise underlying the

vocabulary and academic year hypothesis (§4.2.3), as the improvement of the vocabulary and skills necessary for academic writing may be expected to parallel the increased reading demands and lengthier, more multifaceted essays required in third year. However, although the results of the productive academic vocabulary tests completed by the small sample of interviewees shows an improvement in the mean score of 10.32 (Table 4.49a), the analysis of students' use of academic vocabulary in their essays showed little difference between first year and third year (§4.2.3.1, Table 4.7). This reinforces the idea that, while students' vocabularies and writing skills clearly develop to some extent over the course of their undergraduate degree, their writing at third year level nevertheless more closely approximates first-year writing than it does published writing. It would appear that the adjustment to a published style is more likely to occur at postgraduate level.

The section that follows presents an overview of the findings for the lexical bundle hypotheses, with the aim of summarising the results, highlighting the most salient findings, providing possible explanations for those hypotheses not supported by the data, considering the links to the results of other studies, and discussing the implications of these findings.

4.3.7 Discussion of findings

The finding for the bundles (density) and performance hypothesis (HLB1a, §4.3.1.1), that lexical bundles discriminate between students in various ways more than does academic vocabulary, is one of the most important of the study. Investigation into the proportional use of target bundles by students grouped according to academic performance revealed a distinct growth curve in frequency of use from first year to third year, with a far steeper incline for high achievers. This indicates that the high achievers show a degree of growth that outweighs the increase in bundles acquired by the low achievers over their undergraduate studies, due in part to the fact that the high achievers start from a broader base.

The finding for this hypothesis lends support to Biber and Barbieri's (2007) assumption that some bundles are acquired naturally, and begins to address the question posed by Cortes (2004) as to whether students become more proficient in their use of lexical bundles over time. These results also correspond with Crossley and Salsbury's (2011) finding that students' understanding of and ability to produce two-word bundles developed over the course of a year. This increase in bundle usage over the course of a three-year undergraduate degree seems to suggest that exposure to lexical bundles through both the reading material and lectures contributes to students' development of phrasal vocabulary. However, it is important to note that the high achievers are using only 25% of the target bundles by their third year, while the

low achievers use as few as 13% (Table 4.18). Even taking into consideration genre- and topic-differences discussed earlier (§4.2.5.1), it would appear that this exposure is insufficient to provide students with the range of bundles required within the academic context. Following this observation, it may be argued that the acquisition of bundles should be supplemented by explicit teaching (Biber and Barbieri, 2007; Chen and Baker, 2010; Cortes, 2006). As further evidence of the need for overt instruction, the results of the bundle tests conducted with the interviewees reinforce the idea that students are familiar with a few, limited bundles as there was a clear link between high positive keyness values in the student corpus and proficiency on the test (§4.3.6.1; Tables 4.52 and 4.53). In other words, the interviewees generally obtained better results for the bundles that occur with high frequency in the student corpus, while only the high achievers were found to use more bundles with a negative keyness value, that is, had a relatively low frequency in the student corpus (§4.3.6.2). As a specific example to illustrate this point, the interviewee who obtained the highest marks in the group used a range of low frequency vocabulary, idiomatic expressions and hedging devices. This evidence of overuse of a limited number of bundles by the students was established as one of the clear trends throughout both quantitative and qualitative studies, and clearly corresponds to patterns of bundle usage established in previous research (Chen and Baker, 2010; Cortes, 2004; Hyland, 2008a; Li and Schmitt, 2009).

The results of the vocabulary tests and lexical bundle tests conducted on the interviewees showed a high correlation between academic vocabulary and academic performance, and between LB Test 1 and academic performance, but not between LB Test 2 and academic performance (§4.3.6.1). The high correlation between the 2012 and 2013 academic vocabulary tests and academic performance, in conjunction with the better test performance in 2013, suggests that the students' academic vocabulary developed over the course of their undergraduate degree. While this conclusion seems to contradict the finding in HV3a (§4.2.3.1) that there was no significant difference in the use of academic vocabulary in first-year and third-year essays, the reason for this apparent contradiction could be that the vocabulary test, although productive, may be argued to be closer to the receptive end of the *Vocabulary Knowledge Scale* (VKS) (Paribakht and Wesche, 1997, in Schmitt, 2010:16). The VKS is a way of conceptualising the development of vocabulary knowledge, from 'not known at all' to knowledge of every aspect of a word as detailed by Nation (2001:27), including spoken, written and morphological form, meaning, associations, grammatical functions, collocations and constraints on use such as register and frequency. While the productive test prompts the required vocabulary by providing the first two or three letters of the test item in context, Cobb's measure is based on words produced in written texts without any form of elicitation. The productive vocabulary test format is therefore argued to be less challenging than Cobb's

measure of academic vocabulary in free production, with the result that the Vocabprofiler appears to have more validity as an indicator of actual productive vocabulary knowledge.

The discrepancy in results between the two sets of bundle tests may be explained either by the nature of Test 1 which elicited receptive knowledge, or as a result of sample size since Test 1 contained more test items (16 as opposed to 10 in Test 2). The development of lexical bundle tests may serve to address a number of as yet unanswered questions regarding lexical bundles, as discussed in Chapter 5.

The analysis of the individual corpora compiled from the first-, second- and third-year essays of each interviewee also served to support the quantitative results based on the entire student corpus. The count of target bundles used by third years was considerably greater than that for the first years (§4.3.6.2), reflecting a steep increase from first to second year in particular. This finding provides additional support for the bundles (density) and academic year hypothesis (HLB3a, §4.3.3.1) as it corresponds to the result of the quantitative investigation into this hypothesis, in which the third year students' use of bundles more closely approximated that of the published writers than did the bundles used by the first years. It may be argued from this that, as the variety of bundles used by students increases during their undergraduate degree, they are beginning to emulate aspects of the academic prose of published writers. The investigation of the bundles (density) and language hypothesis (HLB2a; §4.3.2.1), on the other hand, revealed far less difference between the corpora of the L1 and AL student groups than between the student and published corpora.

The results of the more detailed analysis of structural and functional types of bundles were far less conclusive. Investigations into the use of structural types by students categorised according to language background and academic performance primarily highlighted evidence of overuse by students, with published writers using a far greater variety of bundle types in relation to both student groups, as discussed previously. This range of structural types included structures headed with a conjunction, modal or dummy subject. Published writers also used a higher proportion of VP-based bundles than anticipated in terms of Chen and Baker's (2010) findings, but further analysis showed a greater use of bundles which reflect inferential and causative relations. The predominant use of noun-based bundles by L1 students and preposition-based by AL students was identified as a result of overuse of a few bundles. The issue of overuse was raised in the course of the interviews as three of the four students who were aware of using bundles all recognised that their use was limited to a few phrases, while a greater range of LBs was used in the journal articles, thus showing an awareness of restricted use. The analysis of the quantitative data revealed no clearly discernable pattern distinguishing

the L1 and AL or PSY100 and PSY300 groups' use of structural types, or of more mature writing by either the L1 or the third-year group, although the analysis of individual corpora showed a far greater use of idiosyncratic bundles by the additional language students.

Similarly, the analysis of the functional types used presents little evidence of clear distinctions between AL and L1 students (HLB2c, §4.3.2.3), first years and third years (HLB3c, §4.3.3.3) or high and low achievers (§4.3.6.2). A key finding with regard to functional types is that published writers use more participant-oriented bundles than any of the student groups. As these particular bundles perform engagement and stance functions it seems clear that this variance relates to the considerably greater proportion of hedging devices found in the published corpus. The general paucity of such devices in student texts tends to suggest that hedging is a feature of more experienced and proficient writers (Byrd and Coxhead, 2010; Hewings and Hewings, 2002; Hyland, 1994; Hyland and Milton, 1997). This perception is reinforced by the finding that even the high performers in the 76% to 72% group of those interviewed used an assertive rather than a persuasive style, with few examples of the bundles which may be regarded as hedges in the published corpus, such as *it is possible that*, *were more likely to* and *to the extent that* (§4.3.3.3 and §4.3.5.2).

The primary conclusion drawn from the study of structural and functional types is that there is far greater difference between the use of both structural and functional types by students in relation to published writers, than by various groups of students in relation to each other.

The study conducted into the use of lexical bundles in academic essays and the IELTS writing test found little evidence of common ground between these genres in terms of the types of bundles which occurred. While the ratio of bundles in the academic essays was roughly double that of the number in the IELTS writing test, there were considerable differences in the use of both structural and functional types. The lack of evidence of a relationship between the density of bundles or structural and functional types in academic essays and in IELTS suggests that the IELTS Task 2 writing test is not appropriate as a measure of academic performance as it is designed to measure a different genre.

Finally, consideration of the themes covered in the interviews revealed that those who had obtained an average of 70% or more for their third-year essays found reading journal articles had contributed to their writing, while students with marks in the 50s and 60s struggled with journal articles and preferred textbooks. This, together with the students' views that they found reading easier as they progressed through their degree, and generally believed that their writing had improved, provides support for the claim that students are likely to acquire bundles

through their reading. Those students who are less inclined to read articles have less opportunity to encounter target bundles in the reading material, and so have fewer opportunities to develop either their low frequency vocabulary or their grasp of lexical bundles.

This discussion now turns to the third aspect of this study – the question of the extent to which the IELTS test serves as an accurate predictor of academic performance. The primary link between the three aspects is the issue of predictability of academic performance. Identifying a measure of academic success or failure that has a high correlation with students' academic results would clearly be a valuable tool in ascertaining at the start of their studies those students who are more likely to benefit from academic support.

4.4 IELTS

In its role as a screening mechanism used to determine the language proficiency levels of foreign language students⁶³ in particular (§2.4), the IELTS test is intended to serve as a predictor of academic performance. The assumptions tested in this section are not concerned directly with either vocabulary or lexical bundles, but focus instead on the relationship between the IELTS test results and academic performance.

4.4.1 IELTS and performance (HIE1)

HIE1 (IELTS and performance hypothesis)

Students who perform well in the IELTS test are more likely to perform well academically.

The hypotheses made with regard to the IELTS test are aimed at measuring the degree to which the results for the writing and reading sections of this test can be used to predict academic performance, with the main hypothesis focusing on the link between students' IELTS test results and their academic results. This hypothesis is again operationalised in the form of two working hypotheses, presented in the sections below.

⁶³ These are students for whom English is not a mother tongue, and who are from countries in which English is not an official language, such as Angola, Brazil, the Democratic Republic of Congo, China and Turkey.

4.4.1.1 IELTS writing and performance (HIE1a)

HIE1a IELTS writing and performance hypothesis:

There is a positive relationship between students' IELTS writing scores and academic performance, as measured by their essay results.

The aim here is to assess the relationship between students' scores on the IELTS Task 2 writing test and their academic performance, as measured by their average essay results. While the Task 2 writing test requires students to write an opinion piece of at least 250 words, the Task 1 writing test measures students' ability to explain and discuss the findings presented in a chart or table, as explained in Chapter 2 (§2.4). As discussed in Chapter 3, the opinion piece was regarded as more similar to most types of academic writing at undergraduate level, hence the focus of this research is on the Task 2 IELTS writing test (§3.5.2.5). Table 4.56 below presents the results of the Pearson correlation coefficient tests conducted on the IELTS writing scores and essay results to determine the strength of the relationship between these variables.

	<i>n</i>	Mean	Std. deviation	Correlation (<i>r</i>) – IELTS writing
IELTS writing score /100	151	76.01	7.71	—
PSY100 essay average	151	69.50	7.20	.170*
PSY300 essay average	151	68.48	7.13	.287**

** . Correlation is significant at the 0.01 level * .Correlation is significant at the 0.05 level

Table 4.56: Results of correlation tests for IELTS writing test scores and PSY100/PSY300 essay averages

While both correlations are significant, the IELTS writing test correlates more highly with the PSY300 average essay results than with the PSY100 average essay results. Although they provide some support for the IELTS writing and performance hypothesis, these results indicate that there is only a very weak relationship between the IELTS writing results and academic performance, particularly at first-year level.

The final set of results presented in this chapter relate to the assumption regarding the connection between the IELTS reading test and academic performance.

4.4.1.2 IELTS reading and performance (HIE1b)

HIE1b IELTS reading and performance hypothesis:

There is a positive relationship between students' IELTS reading scores and their academic performance, as measured by their essay results.

As with the previous hypothesis, the underlying assumption is that there is a positive relationship between IELTS scores and academic performance, although the focus of this investigation is on the IELTS reading test. Table 4.57 provides the results of the Pearson correlation coefficient tests conducted on the IELTS reading scores and the students' average results for their first-year and third-year essays.

	<i>n</i>	Mean	Std. deviation	Correlation (<i>r</i>) – IELTS reading
IELTS reading score /100	151	74.65	13.76	—
PSY100 essay average	151	69.50	7.20	.373**
PSY300 essay average	151	68.48	7.13	.366**

** . Correlation is significant at the 0.01 level

Table 4.57: Results of correlation tests for IELTS reading test scores and PSY100/PSY300 essay averages

The results in Table 4.57 show that, although the correlations for both the PSY100 and PSY300 essay results in relation to the IELTS reading test scores are low (Mulder, 1982), and therefore indicate a weak relationship, they are nevertheless highly significant. In terms of Cohen's "widely accepted suggestions about what constitutes a small or large effect" (Cohen, 1992, in Field, 2005:32), a correlation of $r = .30$ indicates a medium effect which accounts for 9% of the total variance.

The relative predictive values of the IELTS writing and reading tests are compared in the discussion below, with a view to establishing the stronger predictor before discussing academic and high-level vocabulary, lexical bundles and the IELTS tests in the light of their relationship to academic performance.

4.4.2 Discussion of findings

As illustrated by the correlation matrix in Table 4.58, the correlations for both sets of essay averages in relation to the IELTS reading scores were higher than those for the IELTS writing test. It may therefore be argued that the reading test serves as a stronger predictor of academic

performance, a finding which coincides with the results of studies by Dooley (1999) and Kerstjens and Nery (2002).

The weak relationship between the IELTS writing scores and academic performance in particular ties in with the previous finding that there was a low correlation between the density of academic vocabulary used in the IELTS writing test and in academic essays at first- and third-year levels (HV4a, §4.2.4.1).

	IELTS writing score (<i>r</i>)	IELTS reading score (<i>r</i>)
PSY100 essay average (<i>r</i>)	.170*	.373**
PSY300 essay average (<i>r</i>)	.287**	.366**

** . Correlation is significant at the 0.01 level

*.Correlation is significant at the 0.05 level

Table 4.58: Correlation matrix for PSY100 & PSY300 essay results and IELTS reading & writing test scores

In contrast to the low correlation in the case of academic vocabulary, there was a significant difference between the density of lexical bundles used in the IELTS writing test and in student essays, particularly at the third-year level (HLB4a, §4.3.4.1). These findings suggest a considerable degree of discrepancy between the type of vocabulary used in the IELTS writing test and essay genres, with the result that the weak association reflected between essay results as a measure of academic performance and the IELTS writing score is not unexpected. Similar findings have been reported in a number of other studies including that of Mayor et al. (2007), who found considerable variation between the style of academic texts and IELTS writing, and Moore and Morton (2005:43), who conclude that “the type of writing the [IELTS Task 2] test elicits may have more in common with certain public non-academic genres, and thus should not be thought of as an appropriate model of academic writing”. Similarly, Staples et al. (2013:224) argue that the writing produced in such “high-stakes testing situations ... may constitute a different register than other types of academic writing”. Following from this argument, Vinke and Jochems (1993:276) recommend that language proficiency tests such as IELTS should “demonstrate that the test includes tasks which are representative of the language use tasks required by future academic work”. The discrepancies shown in this study between the use of academic vocabulary and lexical bundles in the students’ essays and in their IELTS writing tests provide considerable support for the view that the nature of the questions in the IELTS test do not elicit the lexical features typical of academic writing at

undergraduate level. It may be argued therefore that the IELTS writing test is a fairly poor predictor of academic performance, particularly with regard to the students' command of both the academic vocabulary and type of lexical bundles required for academic prose.

The implications of the most salient findings are explored in the conclusion, with reference to related research in the literature.

4.5 Conclusion

The extent of this study makes it essential to provide constant internal references and links to the overall framework to ensure that the various threads of the arguments presented are maintained. In order to provide an overview of the findings in this chapter, a summary of the most relevant aspect of each finding is given in the table below. This summary serves as a framework both for the conclusion, and for the discussion in Chapter 5.

Hypothesis	Summary of main findings
HV1	<i>Vocabulary and performance</i>
HV1a	Vocabulary (essay) and performance: The relationship between the use of academic vocabulary and academic performance reduced from first year to third year – the higher the year, the less conclusive the relationship.
HV1b	Vocabulary (test) and performance: Academic and 5000-word level have low correlations with academic performance; highest correlation found at 10 000-word level of receptive test.
HV2	<i>Vocabulary and language</i>
HV2a	Vocabulary (density) and language: The L1 students use significantly more academic vocabulary in their second- and third-year essays than the AL students. (Ranking of academic vocabulary use: 1. published writers; 2. L1 students; 3. AL students.)
HV3	<i>Vocabulary and academic year</i>
HV3a	Vocabulary (density) and academic year: Inconclusive. (Published writers generally use more academic words than students.)
HV4	<i>Vocabulary and IELTS</i>
HV4a	Vocabulary (density) and IELTS: There is a significant relationship between students' use of academic words in the IELTS test and in their essays. (Density of academic words in student essays is more than twice that of IELTS writing test answers.)
HLB1	<i>Lexical bundles and performance</i>
HLB1a	Lexical bundles (density) and performance: There is a significant relationship between the proportion of target bundles used by students in essay writing and their academic performance.

Hypothesis	Summary of main findings
HLB2	<i>Lexical bundles and language</i>
HLB2a	Lexical bundles (density) and language: There is a significantly greater difference between AL students' use of target bundles and that of published writers than between L1 students' use and that of published writers.
HLB2b	Lexical bundles (structures) and language: Inconclusive. (L1 students use fewer verb-based and preposition-based bundles; AL students use fewer noun-based bundles. Published writers use more verb-based bundles and fewer types from the 'other' category.)
HLB2c	Lexical bundles (functions) and language: Inconclusive. (AL students use more research-oriented bundles and fewer text-oriented bundles overall. Published writers use more stance-oriented bundles than either L1 or AL students.)
HLB3	<i>Lexical bundles and academic year</i>
HLB3a	Lexical bundles (density) and academic year: There is a significantly greater difference between first-year students' use of target bundles and that of published writers than between third-year students' use and that of published writers.
HLB3b	Lexical bundles (structures) and academic year: Inconclusive. (First years use fewer noun-based bundles; third years use fewer verb-based bundles. Published writers use more verb-based bundles and fewer types from the 'other' category.)
HLB3c	Lexical bundles (functions) and academic year: Inconclusive. (First years use more text-oriented bundles overall; third years use more research-oriented bundles overall. Published writers use more stance bundles than either 1 st year or 3 rd year students.)
HLB4	<i>Lexical bundles and IELTS</i>
HLB4a	Lexical bundles (density) and IELTS: There are significant differences between the density of target bundles used in the IELTS writing test answers and in both first-year and third-year essays.
HLB4b	Lexical bundles (structures) and IELTS: There are significant differences in the distribution of structural types used in the IELTS writing test answers and in student essays.
HLB4c	Lexical bundles (functions) and IELTS: There are significant differences in the distribution of functional types used in the IELTS writing test answers and in student essays.
HIE1	<i>IELTS and academic performance</i>
HIE1a	IELTS writing and performance: There is a very weak correlation between the IELTS writing test results and academic performance in the first year, and a low correlation between these test results and academic performance in the third year.
HIE1b	IELTS reading and performance: There is a low correlation between the IELTS reading test results and academic performance at first-year and third-year level; the IELTS reading test is a slightly better predictor of academic performance than the writing test.

Table 4.59: Summary of the main findings for each hypothesis

While the reading and writing sections of the IELTS test appear to be fairly weak predictors of academic performance, and academic vocabulary serves as a moderate predictor of academic performance primarily for those students with a fairly low level of language proficiency, lexical bundles may be regarded as the best predictor of academic performance in the context of this study.

In light of the claim by Kerstjens and Nery (2000:87), that “the lower the English language proficiency, the greater an effect this has on academic outcomes”, it may be argued that, while low IELTS scores can be used as an indicator of poor language proficiency, too many other variables impact on tertiary education for IELTS scores to be significant predictors at higher levels of academic performance (Elder, 1993; Hirsh, 2007; Woodrow, 2006). Following this line of reasoning, I would argue that tests of academic vocabulary could function similarly as predictors of academic performance predominantly for those students whose level of language proficiency does not meet generally accepted requirements for university education, including a vocabulary of between 8000 and 10 000 words (Nation, 2006; Treffers-Daller and Milton, 2013). For this reason, while vocabulary tests at the 5000 and academic word levels proved reliable predictors within the context of a study of students from largely disadvantaged backgrounds (Scheepers, 2014; §4.2.6), the 10 000-word level proved a more reliable predictor in the case of this study, in which the students were generally from more privileged backgrounds.

The finding that lexical bundles appear to be more closely linked to academic performance than academic words from the Academic Word List (HLB1a; §4.3.1.1) may be accounted for partly by the conception that words are inherently connected by means of a network of associations or ‘lexical networks’ (§2.2.6.1). As such, words are stored and retrieved in predictable chunks rather than as independent units, thereby enabling speakers to process meaning more quickly. It follows from this argument that lexical bundles have psychological validity (Jiang and Nekrasova, 2007) and are key to the processing of meaning. This suggests that the use of lexical bundles may provide a better reflection of students’ understanding of complex lexical networks than does their use of academic words. This would then account for the closer relationship between lexical bundles and students’ performance within the academic context as those with access to a variety of bundles are better equipped to deal with academic prose, both in lectures and in reading material:

... teaching such lexical phrases and functional categories enhance[s] students' ability to comprehend academic lectures, principally by teaching them to *predict* what type of information is coming up next and to *organize* and *interpret* the flow of information more easily.

(DeCarrico and Nattinger, 1992:91.)

Following a review of the study, various ways in which the teaching of lexical bundles can be approached in the classroom are explored in the next chapter. In addition, the contribution of the study, recommendations following from the findings and a number of limitations are considered.

Chapter 5

Conclusion

5.1 Introduction

This chapter reviews the aims of the study and the main findings. It then discusses the study's contribution, with pedagogical implications and associated recommendations for implementation. Limitations of the study are considered, and suggestions for further research presented.

5.2 Review

This study investigated the degree to which undergraduate students' understanding and appropriate use of academic and high-level vocabulary as well as lexical bundles in essay writing are linked to academic performance. The methodology involved the development of a substantial corpus of student writing in one specific discipline, psychology, over the course of a three-year undergraduate degree, in parallel with a corpus of related journal articles. These articles represented published writing in the same discipline as the student essays, and allowed for comparisons of novice and expert writing, in addition to comparisons of student writing by first-language and additional language speakers as well as by academic high and low achievers. In addition to quantitative and qualitative analyses of students' use of academic vocabulary and lexical bundles in the student corpus, a variety of vocabulary and lexical bundle tests were conducted as a further means of assessment, and interviews held with a small sample of participants.

5.2.1 Aims and research questions

In addition to the broad aim of this study, that is, determining the degree to which measures of academic (and, to some extent, low frequency) vocabulary as well as lexical bundles relate to academic performance, a number of specific aims were formulated. These included comparing the use of academic vocabulary and lexical bundles in the writing of first-language and additional language students with their use in published writing, exploring the extent to which there is development in students' use of academic vocabulary and lexical bundles over the course of a three-year undergraduate degree, and comparing the use of academic vocabulary and lexical bundles in student academic writing to their use in IELTS writing tests.

These aims were addressed through the investigation of research questions designed to explore the issues relating to academic vocabulary, lexical bundles and the IELTS tests in turn. Firstly, the aims regarding academic vocabulary were addressed in the course of investigating the following research questions⁶⁴:

- a. Is there a relationship between students' use of academic vocabulary in their essays and their academic performance, as measured by their essay results over the course of their undergraduate studies?
- b. Is there a relationship between students' results on the academic and low-frequency components of receptive and productive vocabulary tests and their academic performance, as measured by their essay results during the course of their undergraduate degree?
- c. Is there a difference in the density of academic vocabulary used by L1 students and AL students, relative to the density of academic vocabulary used by published writers?
- d. Is there a difference in the density of academic vocabulary used by first-year and third-year students, relative to the density of academic vocabulary used by published writers?
- e. Is there a difference in the density of academic vocabulary used by students in their essays and that used in IELTS writing tests, taking into account the differences in length of texts?
- f. Is there a relationship between appropriateness of use of academic vocabulary by students relative to published writers, and their academic performance?

To address the aims regarding lexical bundles, the following questions were considered, again taking into account the differences in lengths of texts in each case:

- g. Is there a relationship between density of students' use of lexical bundles and their academic performance over the course of their undergraduate studies?
- h. Are there differences in the density, structures and functions of lexical bundles used by L1 and AL students, relative to the bundles used by published writers?
- i. Are there differences in the density, structures and functions of lexical bundles used by first-year as opposed to third-year students, relative to the bundles used by published writers?
- j. Are there differences in the density, structures and functions of lexical bundles used by students in their essay writing as opposed to in IELTS Task 2 writing tests?

⁶⁴ For convenience and uniformity, the research questions formulated in Chapters 1 and 3 are reproduced here.

- k. Is there a relationship between the appropriateness of use of lexical bundles by students relative to published writers, and their academic performance?

Finally, the extent to which the IELTS test serves as a reliable measure of academic performance was addressed in the following two questions:

- l. Is there a relationship between students' results on the IELTS writing test and their academic performance, as measured by their essay results?
- m. Is there a relationship between students' results on the IELTS reading test and their academic performance, as measured by their essay results?

The operational hypotheses which formed the basis of the study were derived from these research questions, and were investigated through the analysis of the student and published corpora. This investigation was conducted using a mixed methods approach which entailed both quantitative and qualitative techniques. The main findings of this study are outlined in the next section.

5.2.2 Main findings

The order in which these findings are presented corresponds directly to the summary of findings tabulated in the conclusion to the results chapter (§4.5), and so focuses first on academic vocabulary. One of the most notable findings is that the relationship between academic vocabulary and academic performance evident in the first year of the undergraduate degree decreases over the course of the second and third years of study. As the density of use of academic vocabulary by students is fairly consistent throughout first-, second- and third-year essays, it seems that the decrease in this relationship must be accounted for by other variables. This concurs with Morris and Cobb's (2004) finding that the VocabProfiler is not appropriate as an independent predictor of academic performance, but should be used in conjunction with other methods of assessment. While it was found that measures of the 5000-word frequency level and academic vocabulary correlate only weakly with academic performance, a regression test showed that the 10 000-word level of the receptive vocabulary test served as a significant predictor (accounting for 28% of the variance). The finding that high level vocabulary is a better predictor than academic vocabulary differs from that of similar studies (Cooper, 1999; Scheepers, 2014), and so appears to apply particularly in the context of stronger students from less disadvantaged backgrounds who generally have a good grasp of the 5000 most frequent words.

Looking more specifically at the vocabulary used by L1 and AL speakers, it was found that L1 students use significantly more academic vocabulary than do AL students, with the published corpus containing the highest occurrence of the three groups. These results therefore conformed to the expected pattern, with the published writers showing the highest proficiency in academic vocabulary, with L1 speakers second and AL speakers third (Hasselgård and Johansson, 2011; Scheepers, 2014; Treffers-Daller and Milton, 2013). This trend was supported by the findings of the qualitative study which revealed far more instances of idiosyncratic use and overuse by AL than by L1 students, and a broader range of vocabulary items used by L1 students, as evident, for example, in a greater range of collocational groupings. This ties in with the finding that AL students generally have a weaker grasp of the 5000-word level, suggesting that they are more likely to struggle with the interpretation of unknown words in context. This conclusion follows from the argument that, the more extensive students' vocabulary, the easier they should find it to identify the meaning of unknown words as the ratio of unknown to known words is reduced (Nation, 2001:233).

The same approach adopted for the investigation of the L1 and AL corpora was used to examine the occurrence of academic vocabulary in the corpora of first-year and third-year students. However, the results showed little difference in the density of academic vocabulary between these students. This investigation served to reinforce the finding that published writers generally use more academic vocabulary than students, whether the students are grouped by language background or academic level.

The primary finding in the study of academic and high level vocabulary was that, where students are not at risk, there is a low correlation between density of academic vocabulary use and academic performance. In support of Cummins' (1981) lexical threshold hypothesis, this weak relationship suggests that, while academic vocabulary appears to be a significant variable for students with a poor grasp of high frequency vocabulary, including the academic and 5000-word levels, it is less influential in the case of students with a good understanding of vocabulary below the 5000-word threshold level as other factors such as high level vocabulary and inferencing skills then come into play (Pretorius, 2000).

Arguably the most important finding in the study of lexical bundles was that density of bundle use may provide some measure of academic performance among undergraduate students. Not only did the third years use considerably more target bundles than the first years as a result of incremental increases over the course of the undergraduate degree, but the high achievers were found to use far more target bundles than the low achievers. The increases in bundle use were particularly marked in the case of the high achievers who started from a

broader base with a greater range of bundles in the first year, and so were found to develop their use of bundles significantly each year relative to the low achievers. One of the conclusions drawn from this finding is that there may be a link between bundle use and perceptions of good writing, although the nature of this link requires further study, as discussed below (§5.6). A further conclusion was that students seemed to acquire a small proportion of target bundles through exposure to reading and listening over the course of their degree, with the high achievers – arguably better readers (Pretorius, 2000) – acquiring more bundles than the low achievers. The implications of this are discussed in more detail below (§5.4).

Investigations into the density of bundle use by students grouped according to language background showed that the difference between the L1 and published corpora was somewhat less than that between the AL and published corpora. This indicates that, as with academic vocabulary, the L1 students' use of bundles more closely approximates that of published writers, albeit only to a minor extent. Similarly, third-year students' use of target bundles was closer to that of published writers than was their use by first years. This supports the finding in the bundles (density) and performance hypothesis that students' understanding and appropriate use of bundles develops over the course of their undergraduate degree. I would argue on this basis that bundle accuracy appears to increase with more general language competence, as was found by Crossley and Salsbury (2011). Nevertheless, as with academic vocabulary, there is far less difference overall between the student groups, whether based on language background or on academic year, than between these groups and the published writers.

My research into the use of structural and functional types by various student groups did not reveal any significant differences in the overall distribution between those grouped according to language background or academic year and the published writers. However, my investigation into the use of functional types showed that all student groups used far fewer participant-oriented bundles than published writers, with the fewest being used in the AL student corpus. As a considerable portion of these bundles comprises stance features which convey the writer's attitude (Hyland, 2008b), the underuse of participant-based bundles by AL students in particular supports Hyland and Milton's (1997:183) argument that second language students struggle "to convey statements with an appropriate degree of doubt and certainty". This finding is supported by evidence from both the quantitative and qualitative analyses which indicates that students used significantly more resultative bundles (such as *due to the fact* and *as a result of*) and fewer hedges (such as *are more likely to* and *it is possible that*) than did published writers. This underuse of stance-based bundles in addition to an overuse of bundles which express assertion (such as *this is because the* and *one can see that*) strongly suggests

that published writers moderate their arguments to a greater degree than do student writers. Recommendations for interventions with regard to students' general lack of hedging are provided below, following the discussion of pedagogical implications.

A particularly salient finding is that the use of lexical bundles discriminates between various student groups more than does the use of academic vocabulary, and therefore appears to be more closely linked to academic performance. This finding provides strong support for the explicit teaching of bundles as it is clear that only a small proportion of the target bundles were acquired naturally through exposure to reading material and lectures, even by high performing students. Although Cortes (2006) found no significant improvement in students' use of bundles after an intensive period of explicit teaching, this instruction was limited to ten weeks (§2.2.2 and §4.3.6.3). It is possible, therefore, that an extended period of tuition may be more beneficial, particularly since the students in Cortes' study showed an increased awareness of bundles following the intervention. The principle underlying this argument is that, while it is possible for students to acquire a considerable amount of language through exposure, consciously focussing on specific aspects of the language is more likely to accelerate improvement.

A further key finding was that the IELTS Task 2 writing test is not a good predictor of academic performance. Results of the analysis of academic vocabulary in student essays and the IELTS test answers showed that, while the occurrence of this type of vocabulary is directly proportional, approximately double the amount of academic words are used in the essays, with the IELTS writing test topics eliciting a far more informal register than is typical of academic essays.

My investigation into the use of lexical bundles revealed very significant discrepancies between the bundles used in the student essays and in the IELTS writing tests. This supports the view that the IELTS writing test is assessing a somewhat different writing ability to that required by the undergraduate essay. In terms of Bachman's (1991:681) argument that "the language abilities measured by our language tests [should] correspond in specifiable ways to the language abilities involved in the nontest language use", it may be argued that the IELTS writing test is therefore not a good predictor of academic performance.

Following from the finding that there was very little overlap between the lexical features in student essays and in the IELTS writing tests, further investigation showed a particularly weak relationship between the IELTS writing test scores and first-year essay results, with a slightly stronger relationship evident in the case of the third-year essay results. Although both the

IELTS writing and reading tests had only a low correlation with academic performance, the reading test proved to be a marginally better predictor.

In the context of this study, the 10 000-word level receptive vocabulary test proved to be a better predictor of academic performance than either academic or high frequency vocabulary, particularly in the case of the high achieving students. The finding of a consistent relationship between density of lexical bundle use and academic performance also suggests that lexical bundles may serve as predictors, although this aspect of bundles requires further study. A few pedagogical implications of these findings are considered following the discussion of this study's contribution to the field.

5.3 Contribution

The contribution this study has made is considered here in terms of theoretical-methodological, descriptive and applied domains (§1.4). The main contribution at a theoretical-methodological level is the development of a student corpus that spans three years of undergraduate study, in conjunction with a published corpus in the same discipline and on related topics. Key researchers in the field have registered the need for a longitudinal study of this nature to address questions such as the degree to which students' use of bundles develops over an extended period (Biber and Barbieri, 2007; Cortes, 2006; Leech, 2011; Li and Schmitt, 2009).

The only reliable way to identify patterns of development in the use of lexical bundles by students at different levels would be to conduct a longitudinal study of the same students, investigating the evolution in the production of target bundles in their writing.

(Cortes, 2002b:234.)

The fact that this corpus was designed to focus on undergraduate students and includes not only a range of academic levels but also native and non-native speakers of English, adds considerably to its value as a research tool. As an example of this, the general conclusion is that language learners tend to overuse high frequency items (e.g. *as a result of*) and underuse low frequency items (e.g. *on the basis of*) (Chen and Baker, 2010; De Cock, 2000; Hasselgren, 1994; Paquot, 2010). Furthermore, the corpus of journal articles on similar topics to those in the student essays adds to the value of the student corpus as it provides a benchmark of published writing in psychology in terms of which the student writing may be assessed. This aspect of the study links with one of the four main contributions at a descriptive level, now discussed below.

The first main contribution at a descriptive level relates to the comparison of student and published corpora. The development of a corpus of student and published writing within the same discipline has meant that the findings of this study can help to address questions regarding differences between novice and expert writing in the discipline, here psychology. These include differences in the use of hedging devices, personal pronouns and stance bundles (§4.3.5), thereby reinforcing and building on from the results of previous studies (Chen and Baker, 2010; Hyland, 2008b; Hyland and Milton, 1997). Investigation into differences of this kind helps to illuminate the gap between novice and expert registers, thereby shedding light on what students require to become more proficient writers (Cortes, 2004; Jablonkai, 2009; Hasselgård and Johansson, 2011).

A second main contribution at a descriptive level concerns the acquisition of bundles and stems directly from the longitudinal nature of the study. It seems evident from my findings that lexical bundles are indeed acquired through exposure, if only to a limited extent (§4.3.1.1). This is important as it begins to address the questions posed by Cortes (2004) as to whether bundles are acquired through reading. At the same time, these findings support the argument that bundles should be explicitly taught as relatively few were acquired in the three-year period (§4.3.7).

The third main contribution at a descriptive level provides support for Cummins' (1981) lexical threshold hypothesis. The apparent contradiction between the results of studies which have shown a strong correlation between academic vocabulary, the 5000-word level and academic performance (Cooper, 1999; Scheepers, 2014), and the results of my study which indicate only a weak relationship between these variables may be accounted for in terms of the difference between the participants in the studies (§4.2.6). While the earlier studies were conducted at a tertiary institution in South Africa where the students were generally from more disadvantaged backgrounds, the participants in this study tended to be academically stronger, obtaining better marks overall. The results of various vocabulary tests in these studies indicate that, where students have a poor grasp of the 5000-word level and academic vocabulary, there is a strong correlation with academic performance, while there is little correlation between the results of students with a good grasp of this vocabulary and their academic performance. The argument derived from this finding supports the hypothesis that a minimum vocabulary is required for the activation of higher order cognitive processes such as the integration and evaluation of information essential for the meaningful interpretation of academic texts (Pretorius, 2000). Below this threshold, the students' knowledge of words forms a key component of their reading skill, and so, by extension, academic proficiency, while above this threshold factors such as

inferencing skills and an understanding of the broader context play a more crucial role in the students' ability to both comprehend and produce academic texts.

The fourth contribution at a descriptive level relates more specifically to the identification of two variables that appear to affect academic performance. My finding that the 10 000-word level appears to be a more reliable predictor of academic performance for stronger students than either academic vocabulary or the 5000-word level is relevant to the field as it suggests that the development of further tests based on low frequency vocabulary may be worthwhile. Probably the most important finding of the study with regard to academic performance was the very significant relationship found to exist between lexical bundles and academic performance. This discussion now turns to the contributions made at an applied level.

One of the main contributions at an applied level was the development of lexical bundle tests. If, as argued above, assessments of discipline-specific bundles may provide reliable indicators of academic performance, the development of bundle tests must then be considered an important contribution to the field. While the test format was based to some extent on exercises designed by Cortes (2006), the material was drawn from student essays and journal articles in psychology, and so was specific to the discipline. Although only one of the two lexical bundle tests conducted was found to be significantly related to the third-year essay averages, the correlation between these results was nevertheless high despite being based on a small sample (§4.3.6.1). This finding suggests that the development of more valid and reliable bundle tests may be beneficial both as a gauge of academic potential and as a teaching tool, and would be worth further investigation. This point is discussed in the pedagogical implications section (§5.4).

The second contribution at an applied level relates to the question of how my findings could help in the development of flexible courses involving the use of lexical bundles in different disciplines. Key to students' appropriate use of bundles is the creation of an awareness of how bundles are used in academic texts (Cortes, 2006). This can be done both by encouraging the students to read widely (§4.3.6.3) and by means of exercises which target specific bundles. One of the aims of any exercises should be to illustrate the range of bundles used to perform different functions, thereby raising students' awareness of the rhetorical functions which bundles perform. Particular areas of focus highlighted by my findings are outlined in the recommendations (§5.5).

Given that this study is concerned with specific lexical features of L1 and AL university undergraduates, the findings naturally have a number of strategic implications for classroom practice. These are discussed below.

5.4 Pedagogical implications

While the focus of this study has been descriptive rather than pedagogical, a number of more practical implications for the language classroom have arisen naturally as a result of the subject matter. The main theme linking these implications is the argument that students such as the low achievers in this study would benefit from academic support.

The finding that students' use of lexical bundles increases incrementally over the course of their undergraduate studies serves to reinforce the argument that they acquire aspects of academic prose through exposure to reading material as well as to lectures and tutorials. Further support for this argument was provided by the perception of the majority of students interviewed that their understanding of vocabulary and writing ability had increased steadily over the course of their undergraduate degree. However, the development of skills and aspects of language required for the academic environment seems to occur at different rates in various student groups as evident, for example, in the varied increase in lexical bundle use by high and low achievers (§4.3.1.1). Linked to this is the fact that, among the interviewees, those students who had obtained average essay scores of 70% or higher had grown more confident in their reading of journal articles, while those who obtained averages in the 50s and 60s generally found textbooks easier to read. This finding seems to provide further support for the 'Matthew effect' discussed by Pretorius (2000:37) in which "the rich get richer and the poor get poorer". In other words, those students who started their academic studies with reading skills that enabled them to initially make sense of, and later become more familiar with, the academic prose typical of journal articles, improved both their vocabulary and their own academic writing style, and so improved their academic results. On the other hand, those students who were unable to 'crack the academic code' (Cross, Shalem, Backhouse and Adam, 2009) and so preferred to read textbooks as they found these to be more accessible than journal articles, did not improve their academic skills to the same extent. One of the implications of this discrepancy between high and low achievers is that many of the AL and weaker students require additional academic support. These results suggest that these students would benefit from assistance with both reading and explicit vocabulary instruction, as discussed in the recommendations section below.

The results of the qualitative analysis as well as the bundle tests showed that the students in this study generally experienced problems with low frequency bundles, and tended to underuse these bundles as a result (cf. Durrant and Schmitt, 2009). An additional finding was that the high achievers were distinct among the interviewees in their use of bundles that occurred with higher frequency in the published corpus than in the student corpus. Furthermore, idiosyncratic uses of bundles occurred more commonly in the writing of low achievers and patterns of bundle usage by students tend to be maintained over the course of their undergraduate degree. This was exemplified to some extent by the consistent proportions of target bundle use, so that those who used a limited number of bundles in the first year increased their usage far more gradually than those who started with a broader range. Although there is as yet no evidence to suggest that students' use of bundles is positively affected by intervention (Eriksson, 2012), my findings support the implication drawn in other studies that students would benefit from explicit instruction of lexical bundles in order to raise awareness of the low frequency bundles in particular (Cortes, 2004; Biber and Barbieri, 2007; Byrd and Coxhead, 2010). The aim of this increased awareness should be to encourage students to move away from the more common items which they favour towards items that occur with relative frequency in their academic field. This ties in with Leech's (2011:15) view that, "applied to learning processes, frequency should be a *relative*, not an *absolute* quantity".

Another implication which follows from the results of the bundle tests is that context seems to play a key role in influencing students' ability to identify appropriate lexical bundles. For example, students were not always able to identify bundles in which a causative link is required, a finding that ties in with the low achievers' and AL students' underuse of *as a result of* (§4.3.5.2). I would suggest that the provision of explicit tuition regarding bundle functions may help these students make more sense of the context, particularly if this is done through the use of concordance lines, as discussed in the recommendations section. Evidence from this study as well as that of Crossley and Salsbury (2011), that development of lexical networks is linked to the development of general language competence, reinforces the importance of teaching semantic networks rather than words in isolation (Hancioğlu and Eldridge, 2007). This ties in with Gardener's (2007:256) findings that native speakers "tend to store and utilise multiword units more productively" than non-native speakers. Similarly, Crossley and Salsbury (2011:4) report on research which has shown that "more competent L2 learners use more multi-word lexical units and use them more accurately and with more variety than less proficient L2 learners". Closely linked to this finding is the view that "collocations are among the determining factors which characterise good writing" (Nizonkiza and Ngwenya, 2015:227). As the qualitative findings showed a marked discrepancy in the use of collocations by L1 and AL students, with first-language students having access to a far wider range of appropriate

collocates (§4.2.5.2), it seems likely that the explicit teaching of high-frequency collocations relating to academic vocabulary in the discipline may benefit additional language students in particular (Durrant, 2009). Examples of such high-frequency collocations from the psychology corpus include *awareness + of* and *abundantly / increasingly + evident*. However, it must be recognised that the identification of relevant collocations is extremely time-consuming, even given statistical tools such as Mutual Information scores (§2.2.6.1) and log-likelihood (§4.2.5.1), while the impact on student writing is not guaranteed (Eriksson, 2012). For this reason, time may be better spent on raising students' consciousness regarding collocational pairings by noting associations between words as they are encountered in texts rather than risk teaching lists of words.

The short-term instruction and rote learning of uncontextualized formulaic sequences limit ... learners' exposure to written discourse and give learners no opportunity to understand the precise meanings, pragmatic functions, and structural qualities of such sequences within any particular discourse community.

(Li and Schmitt, 2009:86.)

A key aspect of this study is the argument that existing vocabulary not only provides a framework in terms of which new vocabulary can be slotted into semantic networks which provide a context of associated meanings, but that, the more extended the semantic network, the greater the variety of associated meaning the speaker has access to.

Connections between words allow newly acquired words and phrases to be more easily assimilated within these networks because new words are not learned in isolation, but through links to already learned words.

(Crossley and Salsbury, 2011:6.)

The relationship between the density of target bundles used and students' academic performance found in this study strongly supports the argument that competent use of formulaic sequences contributes to success at university. This view is reinforced by Cortes (2004:398), who suggests that students who have a restricted vocabulary, and so a limited number of associations between words and a relatively narrow range of lexical bundles, are less likely to be able to establish links between words. This is then likely to create barriers to the interpretation of academic arguments as the inability to perceive associations between words could result in gaps in the logical flow of the premise on which the argument is based. I would argue for this reason that lexical bundles are key to success in university studies, as claimed by Cortes:

... the frequent use of lexical bundles ... seems to signal competent language use within a register to the point that learning conventions of register use may in part consist of learning how to use certain fixed phrases.

(Cortes, 2004:398.)

A significant implication of the connection between lexical bundles and university success is the role that lexical bundle tests could play in the implementation of university screening measures. As discussed previously (§5.3), the development of bundle tests appears to present a promising avenue of further research into measures of academic performance designed to identify students who require some degree of academic support.

This study presents considerable evidence that lexical bundles are key to “establishing a credible academic voice” (Pang, 2010:5). As Boughey (2013) asserts that literacies in South African schools typically do not prepare students for university, and as findings suggest that students do not acquire the bundles necessary for proficient academic prose simply through exposure, a clear implication is that lexical bundles should be explicitly taught. An additional argument for explicit instruction is that many of the South African students who struggle with the demands of university study are not aware of their particular language problems. Research by Coetzee-Van Rooy (2011:168) has shown that, while academic staff attribute many of the academic difficulties experienced by students to English proficiency, the students frequently do not share this perception, tending to “overestimate their language abilities”. The aim of this instruction should be to raise students’ awareness of the forms and functions of bundles that occur with high frequency in academic texts, focusing particularly on those that are underused in student writing (Cortes, 2004). Recommendations for the teaching of both bundles and collocational links are explored in the next section.

5.5 Recommendations

It is widely recognised among South African educators that one of the factors influencing success at tertiary level is that many students are not studying in their mother tongue, but through the medium of English as an additional language (Boughey, 2013; Cross, et al., 2009; Ross, 2009, Scheepers, 2014; Stephen, Welman and Jordaan, 2004). Since South Africa became a democracy in 1994, an increasing number of students from disadvantaged backgrounds have gained access to English-medium universities around the country, including Wits University. However, subsequent to the democratisation of universities, the throughput rate has not been proportional to the number of entrants as many previously disadvantaged students are forced to drop out after one or two years as a result of poor academic performance

(Ross, 2009). Despite the obvious discrepancies between the advantaged and disadvantaged students, and the notable drop in throughput rate, Wits University phased out Humanities Foundation courses in 2007 (Ross, 2009:461). The results of this study provide further evidence that there is a considerable difference in the range and variety of both vocabulary items and lexical bundles used by first- and additional language students, and that this variation appears to be symptomatic of broader issues such as difficulties with reading. Based on this evidence, I would argue for the re-introduction of academic support programmes for those Wits students identified as at-risk during the first quarter of the year.

The finding that achievement in academic literacy modules taken at university are good predictors of academic success at university is important. The predictive value of the academic literacy modules taken at university implies that universities who support students in this way are spending their money well.

(Van Rooy and Coetzee-Van Rooy, 2015:43.)

Given the results of the research by Coetzee-Van Rooy (2011) which indicate that many previously disadvantaged students do not regard their level of English proficiency as inadequate for university studies, it is essential that students receive good feedback on their essays. This feedback should raise the students' awareness of what is required in an academic essay that was not addressed in their writing. Coetzee-Van Rooy's findings apply particularly to Wits students as the entrance requirements at Wits are higher than at many other universities, a fact that is likely to increase the students' perceptions of their competence within the academic environment. One of the objectives in providing students with feedback would therefore be to alert weaker students to the discrepancy between their perceptions of their own abilities and the lecturers' evaluations of their performance, thereby developing in them a clearer understanding of the value of an academic support programme, which would then be less likely to be met with resistance on the grounds that a student who needs 'help' is perceived as 'incompetent'.

My recommendation would be for the inclusion of corpus linguistics as part of the additional tutoring of AL and low proficiency students. There is a strong argument for the use of both learner and expert corpora in the teaching of academic language and skills as insights from these complementary corpora can inform syllabus and material design (Allen, 2009; Cortes, 2004; Gilquin, Granger and Paquot, 2007; Hewings and Hewings, 2002; Jablonkai, 2009; Tribble, 2011). While the writing of first-year L1 students who perform well overall provides an achievable model for AL and low-achieving students, published writing by academics can provide concrete examples of the proficiency level which students should be working towards,

though genre differences between the two types of writing should be taken into account. In support of this view, Nesi and Basturkmen (2006) suggest an inductive approach in which students employ corpus-based methods such as concordance lines drawn from authentic texts to investigate how words are used in context. Similarly, Pang (2010:7) argues for students to be given opportunities to practise “in meaningful communicative tasks”, and so proposes that concrete examples be used for guided text analysis.

I would propose that the examples used in analysis include idiosyncrasies from the student corpus as these can be used to raise awareness of potential problems in student writing. Particular areas of focus identified as a result of my findings include AL students’ tendency to overuse research-based bundles (such as *the way in which* and *the end of the*) and underuse text-based bundles (such as *in the case of* and *as a result of*). Comparison of the student and published corpora showed that students commonly overused adverbial phrases (*as well as the*) and *that*-clause fragments (*that there is a*), while published writers made more use of bundles headed by modals (*should be noted that*) and dummy subjects (*there is evidence that*). One of the most notable differences between students and published writers which should be addressed is the far more extensive use by published writers of bundles that serve as hedging devices (such as *it is possible that* and *were more likely to*). Linked to this was students’ comparatively limited use of participant-based bundles. Students should be made aware of the functions performed by both stance and engagement bundles (such as *it is import to* and *it should be noted*), and their role in the presentation of an academic argument (§4.3.7). As a final example of the types of bundles which present students with problems, my findings suggest that students would benefit from guidance on bundles which reflect inferential and causative relations (such as *is consistent with the* and *has been shown to*) as these were consistently underused.

Issues that need to be considered in the introduction of corpora to the classroom include the type of corpora and the types of activities to be used. In addition to the use of corpora derived from the writing of L1, high-achieving students to serve as a realistic model for those students struggling with academic writing, and the use of published corpora as a benchmark, Eriksson (2010:194) recommends that students be given the opportunity to investigate their own writing. This has the advantage of increasing the students’ engagement with the task as well as increasing the likelihood that students will be able to relate to the linguistic features being analysed. Although Eriksson’s proposal is intended for doctoral students, the fact that all Wits undergraduates have access to computers and are expected to submit their assignments electronically makes the creation of personalised corpora feasible for them too.

Charles (2007) argues that the text-based nature of corpus analysis allows for the investigation of lexico-grammatical patterns by means of concordance lines, and for the examination of functions within the broader cotext, as illustrated by extracts which in turn present the sentence, paragraph or whole text from which the concordance line is derived.

They begin with discourse-based tasks designed to raise students' awareness of a given function and follow this with hands-on concordancing, which uses the corpus to focus on specific lexico-grammatical options for performing that function.

(Charles, 2007:290.)

The incorporation of both micro- and macro-level aspects within corpus work therefore creates opportunities for students to search for patterns, and by doing so, to establish links between particular forms and functions – a process which Charles (2007:299) refers to as “discovery learning”. Where necessary, students can be provided with guidelines to assist them in connecting meanings. Alternatively, Flowerdew (2009:404) suggests that students work in groups as she found that “more proficient students were able to offer their insights and interpretations on the corpus data, thus assisting the weaker students to gradually develop more independence”. The types of learning activities designed to improve students' awareness of bundles include the comparison of the use of specific lexical bundles in two corpora, either student/student corpora or novice/expert corpora, gap-fills, the identification of rhetorical function in context, the replacement of adverbs and conjunctions with appropriate lexical bundles, and the insertion of bundles into paragraphs where appropriate (Charles, 2007; Cortes, 2006; Flowerdew, 2009; McCarthy and O'Dell, 2008).

Given my findings following the qualitative investigation into lexical bundles and the results of the bundles tests, I would recommend that additional activities be designed to focus on a number of more specific aspects of bundle use. These include the comparison of apparently overlapping bundles such as *due to the fact* and *owing to the fact*. Concordance lines could be used to identify appropriate L1 and R1 collocates (e.g. *due to the fact* + *that*), grammatical cotext where fixed (e.g. *in the sense that* + *NP*), and alternatives to bundles commonly used idiosyncratically by students in relation to published writers (e.g. *when it comes to*). A last suggestion is the guided investigation by students working in pairs or small groups into both concordance lines and extended cotext selected from the L1 and published corpora. Two aims of this investigation would firstly be to explore the impact of using hedging devices appropriately, and, secondly, to recognise typical contexts and functions of open-ended bundles such as *in the face of*, *in the case of* and *in the context of*.

It is critical that the activities are contextualised, thereby compelling students to engage with the text. In commenting on Cortes' (2006) study, Tribble identifies three key features of corpus analysis:

... it is essential: (a) to align the exemplar corpus as closely to the needs of the learners as possible; (b) to recognise that lexical bundles express epistemologies and modes of reasoning which students may not yet be able to access; and (c) that instruction should not be simply a process of presentation, practice and production, but will require the kinds of critical engagement which are implicit in genre approaches to language instruction ...

(Tribble, 2011:102.)

The need to investigate what types of activities are most effective in enabling students to use bundles appropriately in their own writing is one of the recommendations made for further research in this area. These recommendations are presented in the next section following a discussion of the limitations of this study.

5.6 Limitations of the study and suggestions for further research

Various types of limitations are identified in this section, and the reason for each discussed. These include limitations relating to sampling procedures, methodology, design and analysis, as discussed in turn below.

One of the main limitations inherent in the sampling method used is that active participants tend to be high achievers. Those who volunteer for such a study are usually goal oriented, as evidenced by the fact that the majority of interviewees were aiming to continue with honours in psychology. As such, these students are not generally representative of the poorer performers. While a small proportion of the participants for the main study continued from the group who had completed the IELTS tests as part of the pilot study, the majority were drawn from those who had volunteered for the vocabulary tests and demographic survey either in 2011 or in 2012. The primary reason for including these volunteers was the need for data that would permit a comparison of test results and academic performance. Finally, a further problem with the selection process was that it had to be reviewed at the start of the second year as a number of the first-year students in the original group had not continued with psychology. In addition, a number of the second years selected then did not complete the third year as only 174 of the 203 second-year participants advanced into the final year. It must be recognised, however, that attrition of this nature is to be expected in a longitudinal study and should be countered as far as possible by the initial selection of a large number of participants.

A related aspect of the methodology which may be viewed as a limitation is the decision to draw data from only one discipline. However, this decision was based on the fact that a majority of Humanities students opt for psychology in their first year, with the view to continuing with this subject until their third year (§3.5.1). Focusing on psychology therefore provided a substantial amount of writing that was consistent in terms of subject, and so formed the basis for a large corpus. In addition to this, sampling from other disciplines within the Faculty of Humanities, such as international relations, would have resulted in a duplication of variables. As I was interested in a considerable variety of variables, the duplication of these variables from two disciplines within a longitudinal design would have made the study unwieldy.

Two further limitations related to methodology derive from the use of the normalisation procedure and Chi-square test. As discussed in Chapter 2 (§2.3.3), normalised data can result in the unrealistic inflation of lexical bundles in smaller corpora in relation to larger corpora (Cortes, 2002b and 2015). This problem is addressed to some degree by Salazar through the application of the MI technique (Salazar, 2014). While the focus of this study was on the target bundles identified in the published corpus without the application of the normalisation procedure, the lexical bundles in the different student corpora (e.g. L1 vs AL groups) were identified by means of normalisation. The problem relating to the Chi-square test, on the other hand, is that the calculations do not take individual variation between the texts of a corpus into account. This means that although two corpora may be found to differ significantly in the distribution of a certain feature, the validity of such a finding would be questionable if there were high individual variations between the texts within the corpora. To address this issue, Chen (2013) conducted an adjusted frequency test using Gries' (2008) dispersion measure – the 'deviation of proportions' (DP) test, designed to counter the uneven dispersion of linguistic features in different texts: "The purpose of conducting this test was to decide whether the overall frequency of phrasal verbs in each corpus was affected by highly frequent use of this construction by certain individual writers and/or by text length" (Chen, 2013:425). However, it may be argued that the issue of dispersion is of greater concern where the focus is on individual words than in a study of variation in the frequency of entire categories of lexical bundle structures and functions. Nevertheless, as it is clear that the identification and distribution of bundles in smaller corpora need to be considered more carefully in future, the addition of the MI technique in identifying bundles, and of the DP test in measuring dispersion in the Chi-square test is recommended for further study as a means of validating these methods.

Many corpus studies of similar design use a larger corpus such as the International Corpus of Learner English (ICLE) as a reference corpus. However, my concern was to focus on differences within the discipline of psychology. While I referred to the Hong Kong Polytechnic

University's Corpus of Research Articles for a specific point regarding an instance of collocational pairing (§4.2.5.2), the published corpus which I had developed served as the primary reference corpus since it was linked thematically to the student corpus. As there are a number of other studies which have compared corpora in different disciplines, further research could be similarly undertaken comparing my findings to detailed longitudinal studies in other disciplines in the human sciences. One of the aims of such research could be to determine more clearly which bundles are subject-specific and to distinguish these from more widely used bundles.

A limitation with regard to materials design is the fact that the lexical bundle tests were compiled before the keyness analysis had been conducted, with the result that issues relating to overuse and underuse were not considered when the tests were drawn up. This was due primarily to a methodological constraint as the interviews were conducted before the process of incorporating the third-year essays into the student corpus had been finalised. As a result, the student corpus had not been completed when the bundle tests were drawn up prior to the interviews, and the keyness analysis could not be started.

A further point, as noted by Chen and Baker (2010), is that learner errors may have affected the generation of bundles in the development of the corpus. As the method used by WST to identify bundles is based on frequency counts, irregularities in the production of bundles such as misspelling or use of an incorrect preposition would therefore directly impact the count as these bundles would be disregarded by the program. Linked to this is the limited number of idiosyncratic bundles identified in the qualitative analysis. Further studies could consider alternative means of identifying erroneous and non-standard bundles that are likely to skew the data, but should be more closely analysed to establish additional patterns of idiosyncratic use.

A final limitation noted here relates to the degree of subjectivity that is inherent to the categorisation of functional types (§4.3.2.3). There are two factors which could account for the finding of overuse of the 'description' sub-category in my analysis of student bundles. The first of these is the lack of clear distinction between sub-categories such as 'description' and 'quantification' (§3.5.2.3b), while the second was the fact that I conducted the analysis of bundles independently, without assistance from a second analyst who would have needed to be trained. Future research aimed at clarifying distinctions between the sub-categories in the functional framework would contribute significantly to similar studies of lexical bundles.

There is considerable potential for future research in the area of lexical bundles, particularly with regard to raising students' awareness of bundles given the positive relationship between the use of lexical bundles and academic performance. Further research is also required into issues relating to hedging such as the density of reference to first person as opposed to third person, and the use of agent-evacuated passives. Another matter for future research is the extent to which the appropriate and varied use of bundles affects the assessment of writing, and which types of corpus-based activities are most effective in teaching students how to use bundles correctly. Finally, given the finding that lexical bundles provide a better indication of academic performance than the IELTS writing test, it would be of value to test the degree to which they match up against the predictive performance of the NBT and TALL (§1.2).

5.7 Conclusion

An important contribution which this study has made to the field of linguistics is the development of a longitudinal corpus of undergraduate student writing based on psychology essays submitted over a period of three years. Analysis of this corpus, in conjunction with a corpus of published writing from the same discipline, has added to research findings on students' understanding and appropriate use of academic and high level vocabulary as well as lexical bundles.

One of the key findings supports the lexical threshold hypothesis as high frequency and academic vocabulary appear to contribute to academic performance only in the case of weaker students whose vocabulary is below the 5000-word level threshold, while the 10 000-word level appears to be a better predictor of academic performance for stronger students. For this reason, tests of academic vocabulary did not serve as predictors of academic performance in the case of the Wits students in this study, whose class average was in the 60s. Similarly, IELTS reading and writing tests showed a very weak correlation with the students' essay results, particularly in the case of the writing test. Analysis of the academic vocabulary and lexical bundles used in the student essays and IELTS writing tests revealed very little overlap between the genres, confirming that the IELTS test is a measure of a somewhat different genre from the academic essay, where the specific discipline and integration of background texts help to differentiate it from the college composition. My findings therefore suggest that an alternative IELTS test, aligned more closely to the discipline and genre of the test candidate, and in which the reading and writing components are combined, as was the case with the predecessor to IELTS (§2.4), may possibly be more suited to providing some indication of potential academic performance in addition to current measures of English proficiency.

What is arguably the most significant finding of my study was evidence of a direct relationship between the density of students' lexical bundle use and their academic performance. This suggests that lexical bundle tests of the sort used in this study could be one component of university placement tests designed to identify those students who would benefit from academic support. Thus, in addition to confirming the need to raise students' awareness of lexical bundles in academic writing, these findings have some role to play in addressing one of the challenges currently facing South African universities:

To manage the risk of admitting students who achieved below 65% in matric, universities would have to continue to devise and use their own 'placement' tests to identify students who would need additional support to be academically successful at university.

(Van Rooy and Coetzee-Van Rooy, 2015:43.)

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Appendix A: Corpus reference list

PSY100 – May (Assignment 02)⁶⁵

Topic

Write an original essay of approximately 1000 words demonstrating your understanding of the functioning of the four lobes of the brain. Compare and contrast the functioning of the left and right hemispheres. You will be expected to make specific reference to the anatomical markers and symmetries and provide examples of functional deficits associated with specifically located lesions.

Prescribed reading (1)

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4. Brook, M. and Kosson, D.S. 2013. Impaired cognitive empathy in criminal psychopathy: Evidence from a laboratory measure of empathic accuracy. *Journal of Abnormal Psychology* 122(1): 156-166, doi: 10.1037/a0030261.
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⁶⁵ All essay topics listed in this bibliography are the intellectual property of the Psychology Department within the University of the Witwatersrand.

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PSY100 – August (Assignment 03)

Topic

Discuss the role of resilience in development amongst youth-at-risk with reference to a critical discussion of Erikson's theory of life-span development and its relevance to a South African context.

Prescribed reading (15)

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PSY100 – September (Assignment 04)

Topic

Critically discuss three theories that account for gender differences as set out by Boonzaier and de la Rey, 2008 (In *Psychology: An introduction* eds Swartz, L., De la Rey, C., Duncan, N. and Townsend, L.: 335-344, Cape Town: Oxford University Press).

Prescribed reading (4)

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11. Overall, N.C., Sibley, C.G. and Tan, R. 2011. The costs and benefits of sexism: Resistance to influence during relationship conflict. *Journal of Personality and Social Psychology* 101(2): 271-290, doi: 10.1037/a0022727.
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16. Weiss, D., Freund, A.M. and Wiese, B.S. 2012. Mastering developmental transitions in young and middle adulthood: The interplay of openness to experience and traditional gender ideology on women's self-efficacy and subjective well-being. *Developmental Psychology* 48(6): 1774-1784, doi: 10.1037/a0028893.
17. Wood, D., Kurtz-Costes, B. and Copping, K.E. 2011. Gender differences in motivational pathways to college for middle class African American youths. *Developmental Psychology* 47(4): 961-968, doi: 10.1037/a0023745.

PSY200 – March (Assignment 01)

Topic

Critically evaluate the following statement: "Personality is one aspect of the developing individual that demonstrates the psychological principle of continuity, rather than discontinuity."

Prescribed reading (6)

1. Caspi, A. 2000. The child is father of the man: Personality continuities from childhood to adulthood. *Journal of Personality and Social Psychology* 78(1): 158-172, doi: 10.1037/0022-3514.78.1.158.
2. Caspi, A. and Roberts, B.W. 2001. Personality development across the life course: The argument for change and continuity. *Psychological Inquiry* 12(2): 49-66.
3. Crosnoe, R. and Elder, J.H. Jr. 2004. From childhood to the later years: Pathways of human development. *Research on aging* 26(6): 623-654, doi: 10.1177/0164027504268491.
4. Roberts, B.W. and DelVecchio, W.F. 2000. The rank-order consistency of personality traits from childhood to old age: A quantitative review of longitudinal studies. *Psychological Bulletin* 126(1): 3-25, doi: 10.1037/0033-2909.126.1.3.
5. Roberts, B.W., Walton, K.E. and Viechtbauer, W. 2006. Patterns of mean-level change in personality traits across the life course: A meta-analysis of longitudinal studies. *Psychological Bulletin* 132(1): 1-25, doi: 10.1037/0033-2909.132.1.1.
6. Srivastava, S., John, O.P., Gosling, S.D. and Potter, J. 2003. Development of personality in early and middle adulthood: Set like plaster or persistent change? *Journal of Personality and Social Psychology* 84(5): 1041-1053, doi: 10.1037/0022-3514.84.5.1041.

Related articles (3)

1. Caspi, A., Roberts, B.W. and Shiner, R.L. 2005. Personality development: Stability and change. *Annual Review of Psychology* 56: 453-484, doi: 10.1146/annurev.psych.55.090902.141913.

2. McCrae, R.R., Costa, P.T. Jr., Ostendorf, F., Angleitner, A., Hřebíčková, M., Avia, M.D., Sanz, J. and Sánchez-Bernardos, M.L. 2000. Nature over nurture: Temperament, personality and life span development. *Journal of Personality and Social Psychology* 78(1): 173-186, doi: 10.1037/0022-3514.78.1.173.
3. Moffitt, T.E. 1993. Adolescence-limited and life-course-persistent antisocial behavior: A developmental taxonomy. *Psychological Review* 100(4): 674-701.

PSY200 – May (Assignment 02)

Topic

In the movie ‘*Precious*’, the central character comes from a difficult environment which includes troubled and complicated relationship with both of her parents. The film documents a particular time in her life. For this essay, you will apply Carl Rogers’ Person-Centered, Humanistic theory to account for the way in which this character’s personality may have developed.

Prescribed reading (4)

1. Allport, G.W. 1966. Traits revisited. *American Psychologist* 21: 1-10.
2. Buss, D.M. 1991. Evolutionary personality psychology. *Annual Review of Psychology* 42: 459-491.
3. Campbell, D.T. 1960. Recommendations for APA test standards regarding construct, trait or discriminant validity. *American Psychologist* 15: 546-553.
4. Gadlin, H. and Ingle, G. 1975. Through the one-way mirror: The limits of experimental self-reflection. *American Psychologist* 30: 1003-1009.

Related articles (17)

1. Buss, D.M. 1984. Evolutionary biology and personality psychology: Toward a conception of human nature and individual differences. *American Psychologist* 39(10): 1135-1147.
2. Cheung, F.M., Van der Vijver, F.J.R. and Leong, F.T.L. 2011. Toward a new approach to the study of personality in culture. *American Psychologist* 66(7): 593-603, doi: 10.1037.a0022389.
3. Chiu, C., Hong, Y. and Dweck, C.S. 1997. Lay dispositionism and implicit theories of personality. *Journal of Personality and Social Psychology* 73(1): 19-30.
4. Digman, J.M. 1990. Personality structure: Emergence of the five-factor model. *Annual Review of Psychology* 41: 417-440.
5. Goldberg, L.R. 1993. The structure of phenotypic personality traits. *American Psychologist* 48(1): 26-34.
6. Manczak, E.M., Zapata-Gietl, C. and McAdams, D. P. 2014. Regulatory focus in the life story: Prevention and promotion as expressed in three layers of personality. *Journal of Personality and Social Psychology* 106(1): 169-181, doi: 10.1037/a0034951.
7. McAdams, D.P. and Pals, J.L. 2006. A New Big Five: Fundamental principles for an integrative science of personality. *American Psychologist* 61(3): 204-217, doi: 10.1037/0003-066X.61.3.204.

8. McCrae, R.R. and Costa, P.T. Jr. 1997. Personality trait structure as a human universal. *American Psychologist* 52(5): 509-516.
9. Mehl, M.R., Gosling, S.D. and Pennebaker, J.W. 2006. Personality in its natural habitat: Manifestations and implicit folk theories of personality in daily life. *Journal of Personality and Social Psychology* 90(5): 862-877, doi: 10.1037/0022-3514-90.5.862.
10. Nettle, D. 2006. The evolution of personality variation in humans and other animals. *American Psychologist* 61(6): 622-631, doi: 10.1037/0003-066X.61.6.622.
11. Russell, J.A. 1994. Is there universal recognition of emotion from facial expression? A review of the cross-cultural studies. *Psychological Bulletin* 115(1): 102-141.
12. Safran, J. 1990. Towards a refinement of cognitive therapy in light of interpersonal theory: II. Practice. *Clinical Psychology Review* 10: 107-121.
13. Sibley, C.G. and Duckitt, J. 2008. Personality and prejudice: A meta-analysis and theoretical review. *Personality and Social Psychology Review* 12: 248-279, doi: 10.1177/1088868308319226.
14. Staub, E. 1999. The roots of evil: Social conditions, culture, personality, and basic human needs. *Personality and Social Psychology Review* 3(3): 179-192, doi: 10.1207/s15327957pspr0303_2.
15. Van den Akker, A.L., Prinzie, P., Deković, M., De Haan, A., Asscher, J.J. and Widiger, T. 2013. The development of personality extremity from childhood to adolescence: Relations to externalising and internalising problems. *Journal of Personality and Social Psychology* 105(6): 1038-1048, doi: 10.1037/a0034441.
16. Winter, D.G., John, O.P., Stewart, A.J., Klohnen, E.C. and Duncan, L.E. 1998. *Psychological Review* 105(2): 230-250.
17. Wright, A.G.C., Pincus, A.L. and Lenzenweger, M.F. 2011. Development of personality and the remission and onset of personality pathology. *Journal of Personality and Social Psychology* 101(6): 1351-1358, doi: 10.1037/a0025557.

PSY200 – August (Assignment 03)

Topic

INCREASING YOUR READING SPEED – Can you learn to read faster to save time reading and still understand and recall what you have read?

A number of training programmes claim to be able to dramatically increase one's reading rate (the speed at which one reads) with the same level of comprehension.

Using Feature Network Theory and/or the McLelland and Rumelhart Model, explain how reading speed might be increased. Using the theory and empirical research critically evaluate whether the claims for increased comprehension are indeed valid. Finally, using examples, explain the positive and negative implications of trying to dramatically increase reading speed.

Prescribed reading (17)

1. Bell, T. 2001. Extensive reading: Speed and comprehension. *The Reading Matrix* 1(1), April 2001.
2. Biederman, I. 1987. Recognition-by-components: A theory of human image understanding. *Psychological Review* 94(2): 115-147.
3. Carver, R.P. 1983. Is reading rate constant or flexible? *Reading Research Quarterly* 18(2): 190-215, URL: <http://www.jstor.org/stable/747517>.
4. Carver, R.P. 1992. Reading rate: Theory, research and practical implications. *Journal of Reading* 36(2): 84-95, URL: <http://www.jstor.org/stable/40016440>.
5. Cave, K.R. and Bichot, N.P. 1999. Visuospatial attention: Beyond a spotlight model. *Psychonomics Bulletin and Review* 6(2): 204-223.
6. Chung, S.T.L., Legge, G.E. and Cheung, S. 2004. Letter-recognition and reading speed in peripheral vision benefit from perceptual learning. *Vision Research* 44: 695-709, doi: 10.1016/j.visres.2003.09.028.
7. Daneman, M. and Carpenter, P.A. 1980. Individual differences in working memory and reading. *Journal of Verbal Learning and Verbal Behavior* 19: 450-466.
8. Jackson, M.D. and McClelland, J.L. 1975. Sensory and cognitive determinants of reading speed. *Journal of Verbal Learning and Verbal Behavior* 14: 565-574.
9. Jensen, P.E. 1978. Theories of reading speed and comprehension. *Journal of Reading* 21(7): 593-600, URL: <http://www.jstor.org/stable/40033153>.
10. McClelland, J.L. and Rumelhart, D.E. 1981. An interactive activation model of context effects in letter perception: Part 1. An account of basic findings. *Psychological Review* 88(5): 375-407.
11. Miller, G.A. 1956. The magical number seven plus or minus two: Some limits on our capacity for processing information. *Psychological Review* 63(2): 81-97.
12. Navon, D. and Gopher, D. 1979. On the economy of the human-processing system. *Psychological Review* 86(3): 214-255.
13. Pashler, H. and Johnston, J. 1989. Chronometric evidence for central postponement in temporally overlapping tasks. *The Quarterly Journal of Experimental Psychology, Section A: Human Experimental Psychology* 41(1): 19-45, doi: 10.1080/14640748908402351.
14. Treisman, A.M. and Geffen, G. 1967. Selective attention: Perception or response? *Quarterly Journal of Experimental Psychology* 19(1): 1-17, doi: 10.1080/146407467908400062.
15. Treisman, A.M. and Gelade, G. 1980. A feature-integration theory of attention. *Cognitive Psychology* 12: 97-136.
16. Witty, P.A. 1969. Rate of reading – a crucial issue. *Journal of Reading* 13(2): 102-106, URL: <http://www.jstor.org/stable/40011242>.
17. Wolf, M. 1991. Naming speed and reading: The contribution of the cognitive neurosciences. *Journal of Reading* 26(2): 123-141, URL: <http://www.jstor.org/stable/747978>.

Related articles (0)

PSY200 – October (Assignment 04)

Topic

Question 1:

Markers of personhood like a person's surname correlate with patrilineal identity in patriarchal societies. One could argue that these societies are predominantly collectivist in so far as personal identity is only as meaningful as when it is constructed on the basis of a broader collective and paternal identity. Many people in South Africa are raised by single mothers, some with connection to their fathers and others not. Those without a connection may want to establish contact and even endeavour to change their fathers' surname out of concern that they are '*not using the right surname*'. For many different reasons, others may choose to continue using their mother's surname even after they establish contact with their fathers. Discuss the social psychological significance of paternal identity with the South African context.

Question 2:

"Violent crime is undoubtedly one of the major psychosocial problems that currently preoccupies South Africans" (Stevens, 2009, pg. 514). With specific reference to Erikson's theory of psychosocial development, discuss identity development and violent crime, drawing specifically on the South African situation.

Prescribed reading (9)

Question 1:

1. East, L., Jackson, D. and O'Brien, L. 2006. Father absence and adolescent development: A review of the literature. *Journal of Child Health Care* 10(4): 283-295, doi: 10.1177/1367493506067869.
2. Eaton, L. and Louw, J. 2000. Culture and self in South Africa: Individualism-collectivism predictions. *The Journal of Social Psychology* 140(2): 210-217, doi: 10.1080/00224540009600461.
3. Nduna, M. and Jewkes, R. 2011. Undisclosed paternal identity in narratives of distress among young people in Eastern Cape, South Africa. *Journal of Child and Family Studies* 20: 303-310, doi: 10.1007/s10826-010-9393-4.
4. Thornton, R.H. 1979. The controversy over children's surnames: Familial autonomy, equal protection and the child's best interests. *Utah Law Review* No. 2: 303-345.
5. Triandis, H.C., Brislin, R. and Hui, H. 1988. Cross-cultural training across the individualism-collectivism divide. *International Journal of Intercultural Relations* 12: 269-289.

Question 2:

1. Abrahams, N. and Jewkes, R. 2005. Effects of South African men's having witness abuse of their mothers during childhood on their levels of violence in adulthood. *American Journal of Public Health* 95(10): 1811-1816.

2. Barbarin, O.A., Richter, L. and De Wet, T. 2001. Exposure to violence, coping resources, and psychological adjustment of South African children. *American Journal of Orthopsychiatry* 71(1): 16-25.
3. Hamber, B. 2000. "Have no doubt it is fear in the land" An exploration of the continuing cycles of violence in South Africa. *Southern African Journal of Child and Adolescent Mental Health* 12(1): 5-18, doi: 10.1080/16826108.2000.9632364.
4. Mitnick, M.F. 2006. Developmental pathways: from victim to victimizer? *William Mitchell Law Review* 32(3): 1075-1084.

Related articles (4)

1. Ackerman, B.P., Brown, E.D., D'Eramo, K.S. and Izard, C.E. 2002. Maternal relationship instability and the school behaviour of children from disadvantaged families. *Developmental Psychology* 38(5): 694-704, doi: 10.1037//0012-1649.38.5.694.
2. Barber, B.L. and Eccles, J.S. 1992. Long-term influence of divorce and single parenting on adolescent family- and work-related values, behaviors, and aspirations. *Psychological Bulletin* 111(1): 108-126.
3. Markus, H.R. and Kitayama, S. 1991. Culture and the self: Implications for cognition, emotion and motivation. *Psychological Review* 98(2): 224-253.
4. Triandis, H.C. 1989. The self and social behavior in differing cultural contexts. *Psychological Review* 96(3): 506-520.

PSY300 – March (PSYC3001)

Topic

Abnormal psychology: Demonstrate your understanding of what Anorexia Nervosa and Bulimia Nervosa are by discussing the diagnostic criteria and essential features of each disorder. You should give some attention to the aetiological factors of eating disorders, and include a critical discussion of gender, age, race, class and culture, and how these relate to the eating disorders in the South African context.

Prescribed reading (6)

1. Afifi, M. 2007. Gender differences in mental health. *Singapore Medical Journal* 48(5): 385-391.
2. Herman, A.A., Stein, D.J., Seedat, S., Heeringa, S.G., Moomal, H. and Williams, D.R. 2009. The South African Stress and Health (SASH) study: 12-month and lifetime prevalence of common mental disorders. *South African Medical Journal* 99(5): 339-344.
3. McVey, G.L., Pepler, D., Davis, R., Flett, G.L. and Abdoell, M. 2002. Risk and protective factors associated with disordered eating during early adolescence. *Journal of Early Adolescence* 22(1): 75-95 doi: 10.1177/0272431602022001004.
4. Moosa, M.Y.H. and Jeenah, F.Y. 2008. Involuntary treatment of psychiatric patients in South Africa. *African Journal of Psychiatry* 11: 109-112.

5. Striegel-Moore, R.H., Rosselli, F., Perrin, N., DeBar, L., Wilson, T.G., May, A. and Kraemer, H. C. 2009. Gender difference in the prevalence of eating disorder symptoms. *International Journal of Eating Disorders* 42(5): 471-474, doi: 10.1002/eat.20625.
6. Wakefield, J.C. 2007. The concept of mental disorder: Diagnostic implications of the harmful dysfunction analysis. *World Psychiatry* 6: 149-156.

Related articles (7)

1. Attie, I. and Brooks-Gunn, J. 1989. Development of eating problems in adolescent girls: A longitudinal study. *Developmental Psychology* 25(1): 70-79.
2. Carter, J.C., Stewart, D.A., Dunn, V.J. and Fairburn, C.G. 1997. Primary prevention of eating disorders: Might it do more harm than good? *International Journal of Eating Disorders* 22: 167-172.
3. Fitzsimmons, E.E. and Bardone-Cone, A.M. 2010. Differences in coping across stages of recovery from an eating disorder. *Journal of International Eating Disorders* 43(8): 689-693, doi: 10.1002/eat.20781.
4. Jaffe, A.C. and Singer, L.T. 1989. Atypical eating disorders in young children. *International Journal of Eating Disorders* 8(5): 575-582.
5. Shisslak, C.M., Gray, N. and Crago, M. 1989. Health care professionals' reactions to working with eating disorder patients. *International Journal of Eating Disorders* 8(6): 689-694.
6. Striegel-Moore, R.H., Silberstein, L.R., Frensch, P. and Rodin, J. 1989. A prospective study of disordered eating among college students. *International Journal of Eating Disorders* 8(5): 499-509.
7. Swarr, A.E. and Richards, M.H. 1996. Longitudinal effects of adolescent girls' pubertal development, perceptions of pubertal timing, and parental relations on eating problems. *Developmental Psychology* 32(4): 636-646.

PSY300 – March (PSYC3020)

Topic

Organisational behaviour: Critically discuss the role of leadership in the management of transparency and accountability in South African organisations.

Prescribed reading (15)

1. Analoui, B.D., Doloriert, C.H., and Sambrook, S. 2013. Leadership and knowledge management in UK ICT organisations. *Journal of Management Development* 32(1): 4-17, doi: 10.1108/02621711311286892.
2. Bal, P.M., De Jong, S.B., Jansen, P.G.W. and Bakker, A.B. 2012. Motivating employees to work beyond retirement: A multi-level study of the role of I-Deals and Unit Climate. *Journal of Management Studies* 49(2): 306-331, doi: 10.1111/j.1467-6486.2011.01026.x.
3. Clark, A.E. 1996. Job satisfaction in Britain. *British Journal of Industrial Relations* 34(2): 189-217.

4. Craig, C.A., Allen, M.W., Reid, M.F., Riemenschneider, C.K. and Armstrong, D.J. 2013. The impact of career mentoring and psychosocial mentoring on affective organizational commitment, job involvement and turnover intention. *Administration & Society* 45(8): 949-973, doi: 10.1177/0095399712451885.
5. Dahlström, C. Lapuente, V. and Teorell, J. 2012. The merit of meritocratization: Politics, bureaucracy, and the institutional deterrents of corruption. *Political Research Quarterly* 65(3): 656-668, doi: 10.1177/1065912911408109.
6. Grandey, A.A., Chi, N.-W. and Diamond, J.A. 2013. Show me the money! Do financial rewards for performance enhance or undermine the satisfaction from emotional labor? *Personnel Psychology* 66: 569-612, doi: 10.1111/peps.12037.
7. Kearney, E. and Gebert, D. 2009. Managing diversity and enhancing team outcomes: The promise of transformational leadership. *Journal of Applied Psychology* 94(1): 77-89, doi 10.1037/a0013077.
8. Levin, A.M. and Levin, I.P. 2010. Packaging of healthy and unhealthy food products for children and parents: The relative influence of licensed characters and brand names. *Journal of Consumer Behaviour* 9: 393-402, doi: 10.1002/cb.326.
9. Lewis, A., Thomas, B. and Bradley, O. 2012. Employee socialisation: A platform for employee engagement? *International Journal of Employee Studies* 20(1): 25-59.
10. Mackey, T.K. and Liang, B.A. 2012. Globalisation, evolution and emergence of direct-to-consumer advertising: Are emerging markets the next pharmaceutical marketing frontier? *Journal of Commercial Biotechnology*, 18(4): 58-64, doi:10.5912/jcb.564.
11. Maxwell, R. and Knox, S. 2009. Motivating employees to "live the brand": A comparative case study of employer brand attractiveness within the firm. *Journal of Marketing Management* 25(9-10): 893-907, doi: 10.1362/026725709X479282.
12. Ruiz-Mafe, C., Sanz-Blas, S., Hernandez-Ortega, B. and Brethouwer, M. 2013. Key drivers of consumer purchase of airline tickets: A cross-cultural analysis. *Journal of Air Transport Management* 27: 11-14, doi: 101016.j.jairtraman.2012.10.010.
13. Tang, T.L.-P. 1992. The meaning of money revisited. *Journal of Organisational Behavior* 13: 197-202.
14. Wagner, J.A., Ferris, G.R., Fandt, P.M. and Wayne, S.J. 1987. The organisational tenure – job involvement relationship: A job-career experience explanation. *Journal of Occupational Behaviour* 8: 63-70.
15. Zopiatis, A., Constanti, P., and Theocharous, A. 2014. Job involvement, commitment, satisfaction and turnover: Evidence from hotel employees in Cyprus. *Tourism Management* 41: 129-140, URL: <http://dx.doi.org/10.1016/j.tourman.2013.09.013>.

Related articles (1)

1. Seitz, J. and O'Neill, P. 1996. Ethical decision-making and the code of ethics of the Canadian Psychological Association. *Canadian Psychology* 37(1): 23-30, URL: <http://psycnet.apa.org/doi/10.1037/0708-5591.37.1.23>.

PSY300 – April (PSYC3017)

Topic

Psychotherapeutic interventions

Question 1:

Many authors have suggested that the mainstream approaches in the field of psychology are overly 'Eurocentric' or 'Western' in the sense that they have been developed by a particular group of people for a particular group of people. Choose either Systems Approach or Person-Centred Approach and critically evaluate how applicable its assumptions, propositions and techniques are and are not in the South African context, which is a context far more diverse than the one in which the mainstream field of Psychology originated.

Question 2:

Nomsa, a 42 year old woman, had been working as a child minder for an American couple living in South Africa. She looked after their 3 year old daughter while both parents worked long hours. When the family was due to return to the U. S., the parents asked Nomsa if she would be prepared to move to Manhattan, New York City, to continue to look after their daughter. Nomsa discussed this with her daughter and agreed to go. She was accompanied on the trip to the U.S. by the father of the child she had been taking care of. Once in the U.S., she moved into an apartment with the family where previously she had lived in an informal settlement. After a month, Nomsa started to complain of body pains and trouble sleeping. She began to lose weight. She also became quite paranoid and believed that her employers wanted to kill her. She began to isolate herself and to eat meals in her room instead of with the family. She was particularly suspicious of the mother of the child she looked after because she believed she wanted to poison her and dispose of her body. Nomsa bought a tape recorder and began to tape conversations between her employers to find out exactly how they were planning to kill her. After 3 months, her employers contacted Nomsa's daughter to inform her that they were sending her back to S.A. because they felt "things were not working out". Nomsa arrived home, having travelled alone this time, in a shocking state. According to her daughter, Nomsa had lost weight, was unkempt and appeared to be disorientated and distressed. Her daughter took her to her nearest community mental health care centre for help.

Using one of the approaches you have covered in the course (Psychoanalytic, Cognitive Behavioural, Person-Centered, Systemic or Transactional Analysis), explain how the theoretical assumptions and propositions of the approach can help you make sense of Nomsa's behaviour and presentation; and how techniques of the approach may be applied to improve her quality of life. Use examples to illustrate your points. You will need to include a discussion regarding the cultural aspects of this case as well and how this impacts on the psychotherapeutic approach you have chosen.

Question 3:

A body of research several decades ago (Frank, 1973) found that the therapeutic outcome, as subjectively reported by clients themselves, was pretty much the same regardless of which approach to psychotherapy was used by the therapist. Using the example of two approaches to psychotherapy such as Psychoanalytic therapy and Cognitive Behavioural therapy (making reference to the various commonalities and differences found among these approaches) debate how it is possible that such differing approaches can have such similar end results. Be sure to find sufficient references beyond the course material to address this question, and use examples where useful to illustrate your points.

Prescribed reading (7)

1. Cooper, S. 2007. Psychotherapy in South Africa: The case of Mrs. A. *Journal of Clinical Psychology: In session* 63(8): 773-776, doi: 10.1002/jclp.
2. Eagle, G.T. 2005. Therapy at the cultural interface: Implications of African cosmology for traumatic stress intervention. *Journal of Contemporary Psychotherapy* 35(2): 199-209, doi: 10.1007/s10879-005-27005.
3. Gobodo-Madikizela, P. 2009. Exploring the ethical principle of social responsibility and other ethical issues in the context of the mental health professionals' response to xenophobic violence in Cape Town. *Psycho-analytic Psychotherapy in South Africa* 17(2): 79-101.
4. Grencavage, L.M. and Norcross, J. C. 1990. Where are the commonalities among the therapeutic common factors? *Professional Psychology: Research and Practice* 21(5): 372-378.
5. Hayes, G. 2009. Some reflections on psychotherapy and morality. *Psycho-analytic Psychotherapy in South Africa* 17(2): 111-118.
6. Moll, I. 2002. African psychology: Myth and reality. *South African Journal of Psychology* 32(1): 9-16.
7. Ruane, I. 2010. Obstacles to the utilisation of psychological resources in a South African township community. *South African Journal of Psychology* 40(2): 214-225.

Related articles (4)

1. Ahmed, R. and Pillay, A.L. 2004. Reviewing clinical psychology training in the post-apartheid period: Have we made any progress? *South African Journal of Psychology* 34(4): 630-656.
2. Ellis, A. 1980. Rational-emotive therapy and cognitive behavior therapy: Similarities and differences. *Cognitive therapy and research* 4(4): 325-340.
3. Pillay, A.L., Wassenaar, D.R. and Kramers, A.L. 2004. Attendance at psychological consultations following non-fatal suicidal behaviour: An ethical dilemma. *South African Journal of Psychology* 34(3): 350-363, doi: 10.1177/008124630403400302.
4. Resick, P.A. and Schnicke, M.K. 1992. Cognitive processing therapy for sexual assault victims. *Journal of Consulting and Clinical Psychology* 60(5): 748-756.

PSY300 – April (PSYC3018)

Topic

Child and adolescent psychology

Question 1:

“... as individuals, we do not move through a series of fixed points that are external to us: a ridged pre-ordered series of positions laid in place for us by society. In the case of transitions between social roles, positions or status – youth to adult, wife to widow – our movement is always in relation to others who themselves are also in transition.” (Billington et al., 1998, p. 64). Discuss the development of identity for young South Africans as dynamic and relational to other dynamically developing selves, particularly parents.

Question 2:

“Roles are subjective and integral to our personalities. The roles we play become part of our identities, how we see ourselves and how others see us. They are at the same time objective, outside, handed down across generations. We get our roles ‘off the peg’, with the cultural ‘scripts’ attached.” (Billington et al., 1998, p. 50). Discuss the possible roles that young people in South Africa today may inherit from their parents’ generation and how these roles may be currently being challenged or reinterpreted.

Question 3:

“The distinction between children and adults is given as the basis on the one hand for granting additional rights, and on the other for restricting both the enjoyment of certain rights and the exercise of certain obligations.” (Boyden & Hudson, 1985, p. 4). Discuss the phase of adolescence as a traditional phase between childhood and adulthood and the possibly conflicting roles, rights and responsibilities for South African youth in the twenty-first century.

Prescribed reading (16)

1. Abdullah, T. and Brown, T.L. 2011. Mental illness stigma and ethnocultural beliefs, values, and norms: An integrative review. *Clinical Psychology Review* 31: 934-948, doi: 10.1016/j.cpr.2011.05.003.
2. Bolger, K.E. and Patterson, C.J. 2001. Developmental pathways from child maltreatment to peer rejection. *Child Development* 72(2): 549-568.
3. Call, K.T., Riedel, A.A., Hein, K., McLoyd, V., Petersen, A. and Kipke, M. 2002. Adolescent health and well-being in the twenty-first century: A global perspective. *Journal of Research on Adolescence* 12(1): 69-98.
4. Erdman, P. 1998. Conceptualising ADHD as a contextual response to parental attachment. *The American Journal of Family Therapy* 26(2): 177-185, doi: 10.1080/01926189808251097.
5. Gaganakis, M. 2004. Imposed identities: Adolescent girls’ perceptions of being black and being white. *Perspectives in Education* 22(4): 59-70.

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12. Patel, V., Flisher, A.J., Hetrick, S. and McGorry, P. 2007. Mental health of young people: A global public-health challenge. *The Lancet* 369: 1302-1313 doi: 10.1016/S0140-6736(07)60368-7.
13. Scott, S. 2002. Classification of psychiatric disorders in childhood and adolescence: Building castles in the sand? *Advances in Psychiatric Treatment* 8: 205-213 doi: 10.1192/apt.8.3.205.
14. Seligman, L.D. and Ollendick, T.H. 1998. Comorbidity of anxiety and depression in children and adolescents: An integrative review. *Clinical Child and Family Psychology Review* 1(2): 125-144.
15. Shaw, K., Wagner, I., Eastwood, H. and Mitchell, G. 2003. A qualitative study of Australian GPs' attitudes and practices in the diagnosis and management of attention-deficit/hyperactivity disorder (ADHD). *Family Practice* 20(2): 129-134, doi: 10.1093/fampra/20.2.129.
16. Stevens, G. and Lockhat, R. 1997. 'Coca-Cola kids' – reflections on black adolescent identity development in post-apartheid South Africa. *South African Journal of Psychology* 27(4): 250-255.

Related articles (1)

1. Efron, D. 2006. Attention-deficit/hyperactivity disorder: Are we medicating for social disadvantage? (against) *Journal of Paediatrics and Child Health* 42: 548-551, doi: 10.1111/j.1440-1754.2006.00929.x.

PSY300 – May (PSYC3015)

Topic

Health psychology: As a health psychologist working in a Community Health Center in an impoverished township in Johannesburg, you have been asked to design and implement an intervention focusing on the following health issue:

Cigarette Smoking

Your proposed intervention must include the following:

- i) A focus on prevention.
- ii) The intervention must target one of the following:
 - Individuals
 - Small groups (e.g. family, workplace etc.)
 - A selected population
- iii) A concise but comprehensive overview of the disease/health issue including:
 - Nature of the health issue and associated health risks; incidence or prevalence of the disease in South Africa and factors implicated in the cause (etiological factors).
 - Contextual issues and psycho-social factors (any social, demographic, political factors involved etc.)
- iv) A theoretical framework must be provided to guide your intervention. This is a psychological theory (or theories) or model from those covered in the course, or a discussion of concepts from a psychological point of view, which explains and justifies your proposed intervention (i.e. to help understand the disease, behaviours and issues involved).
- v) A clear and concise layout of your proposed intervention:
 - Target audience
 - Goals of the intervention (the goals need to be feasible, measurable and have a time frame)
 - Implementation strategy (how you plan to implement the intervention)
- vi) A discussion of the strengths and weaknesses of the proposed intervention.

Prescribed reading (8)

1. Ajzen, I. 1991. The theory of planned behavior. *Organisational Behavior and Human Decision Processes* 50: 179-211.
2. Barnes, B.R. 2007. The politics of behavioural change for environmental health promotion in developing countries. *Journal of Health Psychology* 12(3): 531-538, doi: 10.1177/1359105307076239.
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5. Engel, G.L. 1977. The need for a new medical model: A challenge for biomedicine. *Science* 196(4286): 129-136, URL: <http://www.jstor.org/stable/1743658>.
6. Hepworth, J. 2004. Public health psychology: A conceptual and practical framework. *Journal of Health Psychology* 9(1): 41-54, doi: 10.1177/1359105304036101.

7. Prochaska, J.O. and DiClemente, C.C. 1983. Stages and processes of self-change of smoking: Towards an integrative model of change. *Journal of Consulting and Clinical Psychology* 51(3): 390-395.
8. Rosenstock, I.M. 1966. Why people use health services. *The Millbank Memorial Fund Quarterly* 44(3), Part 2: 94-127, URL: <http://www.jstor.org/stable/3348967>.

Related articles (16)

1. Boyle, C.M. 1970. Difference between patients' and doctors' interpretation of some common medical terms. *British Medical Journal* 2: 286-289.
2. Brow, J.P., McGee, H.M. and O'Boyle, C.A. 2007. Conceptual approaches to the assessment of quality of life. *Psychology & Health* 12(6): 737-751, doi: 10.1080/08870449708406736.
3. Critelli, J.W. and Neumann, K.F. 1984. The placebo: Conceptual analysis of a construct in transition. *American Psychologist* 39(1): 32-39.
4. De Ridder, D. 2007. What is wrong with coping assessment? A review of conceptual and methodological issues. *Psychology & Health* 12(3): 417-431, doi: 10.1080/08870449708406717.
5. Kaplan, R.M. 1990. Behaviour as the central outcome in health care. *American Psychologist* 45(11): 1211-1220.
6. Krug, E.G., Mercy, J.A., Dahlberg, L.L. and Zwi, A.B. 2002. The World Report on violence and health. *The Lancet* 360(9339): 1083-1088, doi: 10.1016/S0140-6736(02)11133-0.
7. Marteau, T.M. and Johnston, M. 2007. Health professionals: A source of variance in health outcomes. *Psychology & Health* 5(1): 47-58, doi: 10.1080/08870449008400409.
8. Nduna, M., Jewkes, R.K., Dunkle, K.L., Shai, N.P.J. and Colman, I. 2013. Prevalence and factors associated with depressive symptoms among young women and men in the Eastern Cape Province, South Africa. *Journal of Child and Adolescent Mental Health* 25(1): 43-45, doi: 10.2989/17280583.2012.731410.
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11. Simpson, S.H., Eurich, D.T., Majumdar, S.R., Padwal, R.S., Tsuyuki, R.T., Varney, J. and Johnson, J.A. 2006. A meta-analysis of the association between adherence to drug therapy and mortality. *BMJ* 333(15), doi: 10.1136/bmj.38875.675486.55.
12. Taylor, S.E. 1983. Adjustment to threatening events: A theory of cognitive adaptation. *American Psychologist* 38(11): 1161-1173 doi: 10.1037/0003-066X.38.11.1161.
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15. Webb, T.L. and Sheeran, P. 2006. Does changing behavioral intentions engender behavior change? A meta-analysis of the experimental evidence. *Psychological Bulletin* 132(2): 249-268, doi: 10.1037/0033-2909.132.2.249.
16. Woodcock, A.J., Stenner, K. and Ingham, R. 1992. Young people talking about HIV and AIDS: Interpretations of personal risk of infection. *Health Education Research: Theory and Practice* 7(2): 229-247.

PSY300 – May (PSYC3021)

Topic

Employee well-being: In an article by Hugo Rifkind that appeared in the Irish Independent, Rifkind makes several claims with regard to gender difference in the experience of work-family balance/conflict.

For your assignment, you are expected to use academic literature and articles to provide an evidence-based critique of this article. For example, Rifkind argues that:

- Most of the men that he knows who have kids co-parent pretty equally
- And suggestions that this is not the case are the result of society increasingly not treating men and women equally.

An evidence based critique would look for evidence to confirm or refute Rifkin's claims that men share an equal load for family responsibilities, or alternatively put, that men experience the same work-family balance challenges – and related outcomes – as those experienced by women.

Your essay should include the following:

1. A definition and theoretical outline of work-family balance/conflict.
2. Reference to academic literature and articles related to:
 - a. Gender differences in the experience of work-family balance/conflict
 - b. Gender differences in spill-over
 - c. Gender differences in the experience of work-related stressors and strains
3. A critical engagement with the article and an argument that supports or refutes Rifkin's claims.

Prescribed reading (4)

1. Bakker, A.B. and Demerouti, E. 2007. The job demands-resources model: State of the art. *Journal of Managerial Psychology* 22(3): 309-328, doi: 10.1108/02683940710733115.
2. Demerouti, E., Bakker, A.B., Nachreiner, F. and Schaufeli, W.B. 2001. The job demands-resources model of burnout. *Journal of Applied Psychology* 86(3): 499-512, doi: 10.1037/0021-9010.86.3.499.
3. Salanova, M., Schaufeli, W., Martínez, I. and Bresó, E. 2010. How obstacles and facilitators predict academic performance: The mediating role of study burnout and engagement. *Anxiety, Stress and Coping* 23(1): 53-70, doi: 10.1080/10615800802609965.

4. Schaufeli, W.B. and Bakker, A.B. 2004. Job demands, job resources, and their relationship with burnout and engagement: A multi-sample study. *Journal of Organizational Behavior* 25(3): 293-315, doi: 10.1002/job.248.

Related articles (3)

1. Baumeister, R.F. and Leary, M.R. 1995. The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin* 117(3): 497-529.
2. Diener, E. 1999. Introduction to the special section on the structure of emotion. *Journal of Personality and Social Psychology* 76(5): 803-804.
3. Russell, J.A. and Carroll, J.M. 1999. On the bipolarity of positive and negative affect. *Psychological Bulletin* 125(1): 3-30.

PSY300 – August (PSYC3019)

Topic

Critical social psychology: There has been a remarkable increase in the popularity of self-help literature in recent decades, especially in liberal democratic countries. While the topics covered by self-help are diverse, one distinct topic addressed within literature is how to overcome depression in order to live a healthier, happier and more productive life. A critical orientation would argue that by directing interventions at individuals in the private sphere, self-help approaches to depression have the following effects:

- Denying the socio-political context in which individuals become depressed, and
- Promoting a model of 'active citizenship' that limits how individuality can be expressed.

With reference to Foucault's notions of "disciplinary power" and "technologies of power and the self", critically analyse self-help literature's approach to depression. You are required to elaborate on how self-help, as a form of 'psychological expertise' perpetuates the individualization of political problems. You are also required to discuss the ways in which self-help literature helps to limit the ways in which individuality can be expressed.

Prescribed reading (9)

1. Anderson, L., Lewis, G., Araya, R., Elgie, R., Harrison, G., Proudfoot, J., Schmidt, U., Sharp, D., Weightman, A. and Williams, C. 2005. Self-help books for depression: How can practitioners and patients make the right choice? *British Journal of General Practice* 55: 387-392.
2. Beck, A. 1987. Cognitive models of depression. *Journal of Cognitive Psychotherapy*, 1: 5-37.
3. Coote, H.M.J. and MacLeod, A.K. 2012. A self-help, positive, goal-focused intervention to increase well-being in people with depression. *Clinical Psychology and Psychotherapy* 19: 305-315, doi: 10.1002/cpp.1797.
4. Cuijpers, P., Donker, T., Van Straten, A., Li, J. and Andersson, G. 2010. Is guided self-help as effective as face-to-face psychotherapy for depression and anxiety disorders? A systematic review and meta-analysis of comparative outcome studies. *Psychological Medicine* 40: 1943-1957, doi: 10.1017/S0033291710000772.

5. Gregory, R.J., Canning, S.S., Lee, T.W. and Wise, J.C. 2004. Cognitive bibliotherapy for depression: A meta-analysis. *Professional Psychology: Research and Practice* 35(3): 275-280, doi: 10.1037/0735-7028.35.3.275.
6. McKendree-Smith, N.L., Floyd, M. and Scogin, F.R. 2003. Self-administered treatments for depression: A review. *Journal of Clinical Psychology* 59(3): 275-288, doi: 10.1002/jclp.10129.
7. Philip, B. 2009. Analysing the politics of self-help books on depression. *Journal of Sociology* 45(2): 151-168, doi: 10.1177/1440783309103343.
8. Redding, R.E., Herbert, J.D., Forman, E.M. and Gaudiano, B.A. 2008. Popular self-help books for anxiety, depression and trauma: How scientifically grounded and useful are they? *Professional Psychology: Research and Practice* 39(5): 537-545, doi: 10.1037/0735-7028.39.5.537.
9. Rimke, H.M. 2000. Governing citizens through self-help literature. *Cultural Studies* 14(1): 61-78, doi: 10.1080/095023800334986.

Related articles (0)

PSY300 – August (PSYC3023)

Topic

Organisational psychology: Conduct a job analysis of a chosen job and carefully describe that job focusing on the skills/training needed, the interpersonal interactions, the interactions with technology, and the physical and mental requirements of the job. Next, choose an aspect of the job where you think you can add value to one of the jobs by making a careful argument for a job improvement. This could be some change to the job design, a change to the work scheduling, or a suggestion for additional training or development. Be sure to carefully argue the advantages and disadvantages of your suggested job improvement.

Prescribed reading (4)

1. Asmuß, B. 2008. Performance appraisal interviews: Preference organization in assessment sequences. *Journal of Business Communication* 45(4): 408-429, doi: 10.1177/0021943608319382.
2. Garg, P. and Rastogi, R. 2006. New model of job design: Motivating employees' performance. *Journal of Management Development* 25(6): 572-587, doi: 10.1108/02621710601670137.
3. Golden, L. 2001. Flexible work schedules: Which workers get them? *American Behavioral Scientist* 44(7): 1157-1178, doi: 10.1177/00027640121956700.
4. Lauver, K.J. and Dristof-Brown, A. 2001. Distinguishing between employees' perceptions of person-job and person organization fit. *Journal of Vocational Behavior* 59: 454-470 doi: 10.1006/jvbe.2001.1807.

Related articles (4)

1. Cable, D.M. and Judge, T.A. 1997. Interviewers' perceptions of person-organization fit and organizational selection decisions. *Journal of Applied Psychology* 82(4): 546-561.
2. Caldwell, D.F. and O'Reilly, C.A. III 1990. Measuring person–job fit with a profile-comparison process. *Journal of Applied Psychology* 75(6): 648-657.
3. Lawler, E.E. III and Hall, D.T. 1970. Relationship of job characteristics to job involvement, satisfaction and intrinsic motivation. *Journal of Applied Psychology* 54(4): 305-312.
4. Loher, B.T., Noe, R.A., Moeller, N.L. and Fitzgerald, M.P. 1985. A meta-analysis of the relation of job characteristics to job satisfaction. *Journal of Applied Psychology* 70(2): 280-289.

PSY300 – August (PSYC3034)

Topic

Cognitive studies

Without the flowering of play and imagination in childhood, humans might be seriously disadvantaged in areas that rely on creative potential, unable to move beyond “what is” to consider “what might be”. (Weisberg, Hirsh-Pasek & Golinkoff, 2013, 38)

In their recent article “The impact of pretend play on children’s development: A review of the evidence,” Angeline Lillard and colleagues have critically reviewed the evidence for children’s pretend play playing a crucial role in healthy childhood development (Lillard et al., 2013a). They conclude that the “existing evidence does *not* support strong causal claims about the unique importance of pretend play for development” (Lillard et al., 2013, 1). Commentators on Lillard et al.’s (2013) article (including Weisberg et al., 2013) are not convinced that this is the correct conclusion to have drawn.

Critically discuss and evaluate the claim that *childhood pretend play is not uniquely important in child development*, in the light of relevant theory and empirical evidence. In your essay, you should:

- Define pretend play, and highlight the unique role/s that theorists and research have claimed for pretend play in a child’s development.
- Explain the sense (if any) in which pretend play is distinctive of humans (e.g. from a comparative and/or evolutionary perspective).
- Critically evaluate the claims made for and against pretend play as a unique and necessary feature of healthy child development, in the light of relevant theoretical and empirical considerations.
- Your essay should draw a clear conclusion regarding your informed assessment of the role of pretend play in child development. (As a whole, your essay should comprise an argument towards this conclusion.)

Prescribed reading (5)

1. Bergen, D. 2013. Does pretend play matter? Searching for evidence: Comment on Lillard et al. (2013). *Psychological Bulletin* 139(1): 45-48, doi: 10.1037/a0030246.

2. Lillard, A.S., Lerner, M.D., Hopkins, E.J., Dore, R.A., Smith, E.D. and Palmquist, C.M. 2013a. The impact of pretend play on children's development: A review of the evidence. *Psychological Bulletin* 139(1): 1-34, doi: 10.1037/a0029321.
3. Lillard, A.S., Hopkins, E.J., Dore, R.A., Palmquist, C.M., Lerner, M.D. and Smith, E.D. 2013b. Concepts and theories, methods and reasons: Why do the children (pretend) play? Reply to Weisberg, Hirsh-Pasek, and Golinkoff (2013); Bergen (2013); and Walker and Gopnik (2013). *Psychological Bulletin* 139(1): 49-52, doi: 10.1037/a0030521.
4. Walker, C.M. and Gopnik, A. 2013. Pretense and possibility – A theoretical proposal about the effects of pretend play on development: Comment on Lillard et al. (2013). *Psychological Bulletin* 139(1): 40-44, doi: 10.1037/a0030151.
5. Weisberg, D.S., Hirsh-Pasek, K. and Golinkoff, R.M. 2013. Embracing complexity: Rethinking the relation between play and learning: Comment on Lillard et al. (2013). *Psychological Bulletin* 139(1): 35-39, doi: 10.1037/a0030077.

Related articles (1)

1. Lillard, A.S. and Witherington, D.C. 2004. Mothers' behavior modifications during pretense and their possible signal value for toddlers. *Developmental Psychology* 40(1): 95-113, doi: 10.1037/0012-1649.40.1.95.

PSY300 – September (PSYC3016)

Topic

Community psychology: Capture your ideas about a "21st Century urban community" in a photograph, write about why this photo best represents this idea to you, and then examine the photo in relation to ideas about communities in community psychology theory and research.

Prescribed reading (10)

1. Ahmed, R. and Pretorius-Heuchert, J.W. 2001. Notions of social change in community psychology: Issues and challenges. *Community psychology: Theory, method and practice*: 67-85.
2. Cowen, E.L. 2000. Now that we all know that primary prevention in mental health is great, what is it? *Journal of Community Psychology* 28(1): 5-16.
3. Harris, B. 2002. Xenophobia: A new pathology for a New South Africa? In *Psychopathology and social prejudice* eds. Hook, D. and Eagle, G.: 169-184, Lansdowne: UCT Press.
4. McMillan, D.W. and Chavis, D.M. 1986. Sense of community: A definition and theory. *Journal of Community Psychology* 14: 6-23.
5. Naidoo, A.V. 2000. Community psychology: Constructing community, reconstructing psychology in South Africa. Inaugural lecture. University of Stellenbosch, 1-19.
6. Riger, S. 1993. What's wrong with empowerment? *American Journal of Community Psychology* 21(3): 279-292.

7. Seedat, M. and Lazarus, S. 2011. Community psychology in South Africa: Origins, developments and manifestations. *Journal of Community Psychology* 39(3): 241-257, doi: 10.1002/jcop.20429.
8. Toro, P.A. 2005. Community psychology: Where do we go from here? *American Journal of Community Psychology* 35(1/2): 9-16, doi: 10.1007/s10464-005-1883-y.
9. Townley, G., Kloos, B., Green, E.P. and Franco, M.M. 2011. Reconcilable differences? Human diversity, cultural relativity and sense of community. *American Journal of Community Psychology* 47: 69-85, doi: 10.1007/s10464-010-9379-9.
10. Trickett, E.J. 1994. Human diversity and community psychology: Where ecology and empowerment meet. *American Journal of Community Psychology* 22(4): 583-592.

Related articles (0)

PSY300 – October (PSYC3013)

Topic

Cognitive neuropsychology: *“My smartphone and I: A critical reflection about the cognitive implications of multitasking and their repercussions in my everyday life.”*

In the current society of high-speed access and instant gratification, humans are attempting to get more done in less time. One example is smartphones, which enable you to be in constant contact with the world, 24 hours a day, through internet, social media and messaging. To this end, our use of multitasking in everyday life is increasing.

Multitasking has specific implications on our cognitive functioning, as one is dividing cognitive resources amongst the various tasks attempted simultaneously. Therefore one has to weigh the trade-off between spreading one’s cognitive resources, with the benefit of performing more tasks at the same time.

This essay will require you to examine multitasking from a neurocognitive perspective, and create an argument for or against the use of multitasking in everyday life. Relevant and contextual examples drawn from modern culture could help your argument.

Remember that a good argument will examine both points of view before coming to a conclusion from the evidence presented on both sides. It will be particularly important to discuss how everyday practices have very specific effects on the neuroanatomy and functionality (cognition) of the brain in different developmental stages (from birth to old age).

Prescribed reading (14)

1. Bowman, L.L., Levine, L.E., Waite, B.M. and Gendron, M. 2010. Can students really multitask? An experimental study of instant messaging while reading. *Computers and Education* 54: 927-931, doi: 10.1016/j.compedu.2009.09.024.
2. Dennis, B.C., Houff, S.A., Han, D.Y. and Schmitt, F.A. 2011. Development of neurocognitive disorders in HIV/AIDS. *Neurobehavioral HIV Medicine* 3: 9-18 doi: 10.2147/NBHIV.S7170.

3. Dreher, J.-C., Koechlin, E., Tierney, M. and Grafman, J. 2008. Damage to the fronto-polar cortex is associated with impaired multitasking. *PLoS ONE* 3(9): e3227, doi: 10.1371/journal.pone.0003227.
4. Foehr, U.G. 2006. Media multitasking amongst American youth: Prevalence, predictors and pairings. Retrieved from *The Henry J. Kaiser Family Foundation website*: www.kff.org.
5. Hembrooke, H. and Gay, G. 2003. The laptop and the lecture: The effects of multitasking in learning environments. *Journal of Computing in Higher Education* 15 (1): 46-64.
6. Junco, R. 2012. In-class multitasking and academic performance. *Computers in Human Behavior* 28: 2236-2243, doi: 10.1016/j.chb.2012.06.031.
7. Junco, R. and Cotton, S.R. 2012. No A 4 U: The relationship between multitasking and academic performance. *Computers and Education* 59: 505-514, doi: 10.1016/j.compedu.2011.12.023.
8. Lucas, M. 2013. Neuropsychological assessment in South Africa. In *Psychological assessment in South Africa: Research and applications*. eds Laher, S. and Cockcroft, K.: 186-200. Johannesburg: Wits University Press.
9. Ophir, E., Nass, C. and Wagner, A.D. 2009. Cognitive control in media multitaskers. *PNAS* 106(37): 15583-15587, doi: 10.1073/pnas.0903620106.
10. Prigatano, G.P. 1997. Learning from our successes and failures: Reflections and comments on 'Cognitive rehabilitation: How it is and how it might be'. *Journal of the International Neuropsychological Society* 3: 497-499.
11. Sanbonmatsu, D.M., Strayer, D.L., Madeiros-Ward, N. and Watson, J. 2013. Who multitasks and why? Multitasking ability, perceived multi-tasking ability, impulsivity, and sensation seeking. *PLoS ONE* 8(1): e54402, doi: 10.1371/journal.pone.0054402.
12. Shih, S-I. 2013. A null relationship between media multitasking and well-being. *PLoS ONE* 8(5): e64408, doi: 10.1371/journal.pone.0064508.
13. Watson, J.M. and Strayer, D.L. 2010. Supertaskers: Profiles in extraordinary multitasking ability. *Psychonomic Bulletin and Review* 17(4): 479-485, doi: 10.3758/PBR.17.4.479.
14. Wilson, B.A. 1997. Cognitive rehabilitation: How it is and how it might be. *Journal of the International Neuropsychological Society* 3: 487-496.

Related articles (0)

PSY300 – October (PSYC3022)

Topic

Employment relations: This essay is based on a movie called "Wall Street" (Stone, 1987). The movie is about a young stockbroker, called "Bud" (played by Charlie Sheen), who is highly ambitious. Bud manages to engineer a meeting with a successful business tycoon, called Mr Gekko (played by Michael Douglas) and takes him on as a client. Mr Gekko is very rich and powerful, and represents much that Bud strives for. To achieve his goals, Bud allows himself to be manipulated by Mr Gekko and is even

willing to break laws and get involved in insider trading. The movie shows many organisational political tactics, and how some of the ethical issues play out.

Based on the movie "Wall Street" (Stone, 1987), your task is to analyse the justice issues and power relations and organisational political tactics used by Mr Gekko and Bud. In your essay, you should address this by answering the following questions:

- What is Gekko's business philosophy and values, and how do these influence his interpersonal interactions?
- Identify and discuss the sources of power and political tactics that Gekko uses with Bud. Illustrate these with examples from the movie.
- Why is Bud receptive to Gekko's influence tactics?
- Why do you think that Gekko chooses Bud as a person to influence for his own purposes (as opposed to anyone else)?
- How do Bud's behaviours and values change as he gains more power? Compare his political tactics at the beginning and towards the end of the movie.
- Discuss the issues related to organisational justice that the movie raises.
- Discuss the ethical issues with respect to the use of power in the movie.
- Bud is clearly influenced by Gekko. To what extent is he responsible for his actions?

Prescribed reading (11)

1. Analoui, F. 1995. Workplace sabotage: Its styles, motives and management. *Journal of Management Development* 14(7): 48-65.
2. Ashforth, B.E. 1989. The experience of powerlessness in organisations. *Organizational Behavior and Human Decision Processes* 43: 207-242.
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Related articles (0)

Appendix B: HOD request for consent

To: Head of Psychology Department

Re: Background to research on student writing

Dear Professor Thatcher

I'm writing to request permission to approach the first-year students in your department as possible participants in a research study. This letter outlines the aims of the research and sets out what the participants will be asked to do.

For my doctorate, I'm investigating the writing skills and academic profiles of foreign language students in contrast to those of second language and first language speakers of English. I propose to look at students' performance on the writing and reading components of the IELTS test in addition to their performance on academic essays over the three years of their undergraduate studies. (IELTS is an internationally recognised language competence test. Wits University requires all international students to achieve a score of Band 7.0 on this test as part of the University's admission requirements.)

In order to pursue this study I need access to three subjects with comparatively high retention rates so that a significant proportion of the first year students continue on to third year. This applies in particular to the foreign language students. In addition to having international students, these subjects should also require students to submit a reasonable amount of written work. With the permission of the Head of Department, Coordinators and the students, the aim is to develop a corpus of student writing on the basis of these assignments.

Certain linguistic features of this learner corpus, such as the use of academic vocabulary and multi-word items, will then be analysed and compared with the IELTS test results as well as with the students' academic performance over the course of each year. The findings will be used to determine whether the IELTS test is a reliable predictor of performance, whether specific linguistic features in writing can be used to identify those students who would benefit from bridging courses, and what the significant lexical differences are in the writing of foreign language, second language and first language students.

Having examined statistics provided by AISU, it is clear that Psychology is one of the subjects which fulfils these requirements.

Would you please consider granting me the opportunity to work with your first year students? Initially I would require access to the students in order to request their consent as participants in this study. The research procedure therefore entails the following steps:

1. I would meet with all first year students to explain the research and obtain their permission. This could be done at the end of a lecture period early in the academic year, when the majority of students are together. I estimate that this explanation would take approximately 10 minutes. Any volunteers could then return the consent forms immediately or at the next lecture or tutorial session.
2. Participants then need to complete the reading and writing sections of the IELTS test⁶⁶, which would take two hours. Given that the IELTS test is internationally recognised, is required by Wits University as one of the admission criteria for international students and provides an excellent platform for many of the principles of academic writing, I would like to propose that it is administered to all first year students either during a lecture or during one or two tutorial sessions. In order to follow up on the assessment, I could arrange for an IELTS writing specialist to give one or two lectures on the principles of academic writing, with reference to the test. (This trainer is a qualified IELTS examiner, and has been running IELTS preparation courses in conjunction with academic writing courses for a number of years.) If this were permitted, then all the first year students would benefit, not only the participants.

⁶⁶ Students are required to complete both the reading and writing components of the IELTS test as both scores are necessary for an assessment of competence within the IELTS framework.

However, if you believe that this would not benefit the general body of first years or would disrupt the existing syllabus, I could then arrange for the participants to write the IELTS test at a time that suits them.

3. The second test is a 72-item vocabulary levels test. This test requires participants to match words to short definitions, and takes less than 35 minutes. I would make separate arrangements to meet the participants in their free time in order to conduct the vocabulary test.
4. Finally, all participants would be asked to complete a short questionnaire on their language and educational backgrounds. As this is not an assessment, it could be emailed to them so that they could complete it in their own time.

The IELTS test and the vocabulary test are the only tasks required of students that are not directly based on their Psychology course. However, these are crucial in identifying those aspects of language competence that correlate most closely to students' overall academic performance. I would also like to emphasise that the two tests are the only intrusive aspect of my research, as the collection of data does not require any additional input from participants.

In order to compare the test results with the students' academic performance, I would need access to the students' results over the course of the year, as well as the results of their final exams. I would also ask to be able to make copies of all written assignments and tutorials.

In order to be able to cross-reference the students' IELTS tests, assignments and exam results, I should stress that the data collection will not be anonymous. However, all names will be deleted from the written corpus.

Given that this is intended as a longitudinal study, and that the progress of those participants who continue with Psychology should be traced over the three years of their studies, would it be possible to continue gaining access to these students' written work and marks over the course of 2012 and 2013, given their consent to do so? As it would not be necessary to repeat either the IELTS test or the vocabulary levels test during the second or third year of their studies, I do not anticipate that the students would find this study intrusive after the completion of the initial tests and questionnaire. This research should therefore not impact directly on their studies.

In order to provide participants with feedback, I will ensure that all students involved in the study receive a summary of findings at the end of the first year.

Thank you for your consideration in this regard.

Yours sincerely

Trish Cooper
Email: trish.cooper@wits.ac.za

Appendix C: Signed HOD consent

Research consent form (Head of Department)

As Head of the Psychology Department, I give my consent for the 2011 first-year Psychology students to be involved in the study on lexical features, IELTS and academic performance being conducted by Trish Cooper.

In addition, I grant permission for Trish Cooper to be given access to the assignments and examination results of the following sets of students:

Psychology I	2011
Psychology II	2012
Psychology III	2013

In giving consent, I am not guaranteeing that my staff or students will participate. The participation of both staff and students is entirely voluntary, and their decision as to whether to participate or not in the study will have no bearing on their work or study.

All staff and students involved in the study may withdraw their consent at any time.



10 MARCH 2011

Date

Professor Andrew Thatcher

Head of Psychology

Appendix D: Ethics clearance certificate

UNIVERSITY OF THE WITWATERSRAND,
JOHANNESBURG

Division of the Deputy Registrar (Research)

HUMAN RESEARCH ETHICS COMMITTEE
(NON MEDICAL) R14/49 Cooper

CLEARANCE CERTIFICATE

PROTOCOL NUMBER H11 0212

PROJECT

Exploring the relationship between academic vocabulary and lexical bundles in student writing, IELTS scores and academic performance among university students

INVESTIGATORS Ms T Cooper

DEPARTMENT Linguistics

DATE CONSIDERED 11.02.2011


DECISION OF THE COMMITTEE* Approved unconditionally

NOTE:

Unless otherwise specified this ethical clearance is valid for 3 years and may be renewed upon application.

cars and may be renewed upon app

18.03.2011



CHAIRPERSON (Professor R. Thornton)

cc: **Supervisor:** Prof H Hubbard

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and ONE COPY returned to the Secretary at Room 10005, 10th Floor, Senate House, University.

We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee.

I agree to the completion of a yearly progress report.


Signature

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

Appendix E: Background to the study

Dear student

My name is Trish Cooper. I am conducting research for my PhD study on aspects of students' writing with the aim of finding out how the use of different vocabulary influences academic performance.

My area of focus is on the relationship between the use of certain words and expressions, and students' performance in assignments and essays at undergraduate level.

A secondary aim of this study is to investigate the relationship between aspects of the IELTS test and academic performance. The IELTS test is a measure of language competence that all international non-English speaking students must write to gain admission to Wits University. I would like to determine to what degree this test matches students' academic results for their first, second and third years of study, and also whether the vocabulary required for this test relates to the vocabulary expected by academic departments.

If you volunteer for this study, you will be asked to complete the reading and writing components of an IELTS test as well as a vocabulary test. In addition, you will be asked to complete a short questionnaire on your language and educational background.

I will also request your permission to collect all the written essays and assignments which you submit to the Psychology Department during your studies. The reason for this is to build up a large corpus or data-base of student writing. In each case, the names of all participants will be deleted from the written texts before they are included in the corpus. If you agree to this, you will not be asked to do any additional work in the submission of your essays and assignments. You will simply be giving me permission to gain access to all your written work which I will collect from the Department.

Finally, I will ask for your permission to access your results, including your final examination results. This information is necessary in order to compare features of your writing to your academic performance during your studies. I guarantee that these results will be kept confidential and that no names will be released in any report on the findings.

The Psychology Department has granted permission for this research to proceed. However, your participation in this study is voluntary. Your decision to participate or not will not affect your studies. You may choose to withdraw consent or discontinue participation at any time without prejudice.

The research will be conducted confidentially and the anonymity of all participants will be ensured. On completion of the research, I will make sure that all participants are informed of the findings of the research.

Thank you for taking the time to consider this request. I hope you will consent to become involved in this study as I believe it will be beneficial to undergraduate students in general.

Yours sincerely

Trish

Trish Cooper

Appendix F: Participant consent form

I agree to participate in the study on lexical features, the IELTS test and academic performance being conducted by Trish Cooper.

In giving consent, I agree to complete the two components of the IELTS test in addition to the vocabulary test. I also grant permission for the Psychology Department to release copies of my assignments and essays to Trish Cooper, and agree that she may have access to my results on the understanding that these will remain confidential.

I understand that

- participation in this study is voluntary and will have no bearing on my own studies.
- I am free to discontinue participation at any time without prejudice.
- my written work will be incorporated into a data-base of student writing.
- no information that could be used to identify me will be included in the research report.
- my participation in the research study will remain confidential.

Participant's name

Signature

Trish Cooper

Researcher's name

Signature

Date

Appendix G: Research application to Cambridge ESOL

To: Dr Ardeshir Geranpayeh - Research & Validation Group
University of Cambridge ESOL Examinations
1 Hills Road
Cambridge CB1 2EU
United Kingdom

From: Trish Cooper

Date: 26 January 2011

Re.: Permission to use specimen or retired IELTS test materials

Dear Dr Geranpayeh

I am writing to request permission to use specimen or retired IELTS test materials in the course of research for a doctoral study in the field of Applied Linguistics.

The aim of this research is to investigate the correlation between IELTS writing and reading scores, academic vocabulary, the use of lexical bundles and academic performance in undergraduate students over a period of three years.

Two secondary aims follow from this overall aim:

1. To compare the use of academic vocabulary and lexical bundles in student writing by EFL students against that of ESL and EL1 students.
2. To compare the use of academic vocabulary and lexical bundles in academic essays against their use in the written component of the IELTS test.

The research participants are first-year students registered for Psychology, Law and International Relations at the University of the Witwatersrand in Johannesburg.

I would like to be able to give participants the reading section of a specimen or retired IELTS test as well as the second task in an academic writing test. The results of this test would be used only for the research study and would not be released to the participants. I would agree to release any findings requested to Cambridge ESOL.

Publication of the results would be restricted to the research report and research publications in the relevant field, given the appropriate consent by Cambridge ESOL.

I have attached an abridged proposal as this presents the theoretical background of the study, the research questions and proposed methodology.

Please let me know if you have any questions with regard to this study.

Thank you for your consideration.

Trish Cooper
Email: trish.cooper@wits.ac.za

Appendix H: Letter from Cambridge ESOL

Dear Ms Cooper,

This is to acknowledge receipt of your letter dated 26 January.

Regarding your request for test materials, you can actually find sample IELTS tests in the public domain. These include the official practice materials, for which information can be found at http://www.ielts.org/test_takers_information/how_do_i_prepare.aspx, as well as several volumes of practice tests published by Cambridge University Press (search for "IELTS" at <http://www.cambridge.org>). As these tests are in the public domain, no special permission is required from us to use them in your research, though we would of course welcome seeing any results of your research.

As for engaging the services of an IELTS examiner to mark the writing component, we are unfortunately not in the position to grant your request, as examiners are not employed by us but by the other IELTS partners -- British Council and IDP Australia. In any event, your administration of the test necessarily being under incomplete and non-standard conditions (i.e., one writing task out of the whole test battery), results cannot be said to equate to their "true" IELTS scores, even if marked by a trained examiner.

In that regard, as only international students need take IELTS in reality, why not simply ask the international students in your study to self-report their IELTS scores, perhaps by giving you a photocopy of their official score report? These can still be correlated with your vocabulary test and with your lexical bundle measures. Differences between the three groups in your study can still be compared on the other measures (vocabulary, lexical bundles), including whichever components of the sample IELTS materials you choose to administer.

In general though, we would caution against saying IELTS predicts academic performance, as many non-linguistic factors are involved and can intervene, especially over a period of three years, which would preclude making any meaningful claims about prediction. This is an aspect of your study's design vis-a-vis what you want to claim that you may want to discuss with your supervisor.

We hope this is helpful, and our best wishes on your academic endeavours!

With kind regards,

Gad S. Lim
Research and Validation Officer
Research and Validation

University of Cambridge ESOL Examinations
1 Hills Road, Cambridge, CB1 2EU
Telephone: +44 (0) 1223 558878

www.cambridgeesol.org

Experts in Language Assessment

Appendix I: IELTS reading test

Name: _____ Wits person no.: _____

Email address: _____

Academic IELTS test

Reading section

READING PASSAGE 1

Early Childhood Education

New Zealand's National Pony spokesman on education, Dr Lockwood Smith, recently visited the US and Britain. Here he reports on the findings of his trip and what they could mean for New Zealand's education policy

A

'Education To Be More' was published last August. It was the report of the New Zealand Government's Early Childhood Care and Education Working Group. The report argued for enhanced equity of access and better funding for childcare and early childhood education institutions. Unquestionably, that's a real need; but since parents don't normally send children to pre-schools until the age of three, are we missing out on the most important years of all?

B

A 13-year study of early childhood development at Harvard University has shown that, by the age of three, most children have the potential to understand about 1000 words - most of the language they will use in ordinary conversation for the rest of their lives. Furthermore, research has shown that while every child is born with a natural curiosity, it can be suppressed dramatically during the second and third years of life. Researchers claim that the human personality is formed during the first two years of life, and during the first three years children learn the basic skills they will use in all their later learning both at home and at school. Once over the age of three, children continue to expand on existing knowledge of the world.

C

It is generally acknowledged that young people from poorer socio-economic backgrounds tend to do less well in our education system. That's observed not just in New Zealand, but also in Australia, Britain and America. In an attempt to overcome that educational under-achievement, a nationwide programme called 'Headstart' was launched in the United States in 1965. A lot of money was poured into it. It took children into pre-school institutions at the age of three and was supposed to help the children of poorer families succeed in school. Despite substantial funding, results have been disappointing. It is thought that there are two explanations for this. First, the programme began too late. Many children who entered it at the age of three were already behind their peers in language and measurable intelligence. Second, the parents were not involved. At the end of each day, 'Headstart' children returned to the same disadvantaged home environment.

D

As a result of the growing research evidence of the importance of the first three years of a child's life and the disappointing results from 'Headstart', a pilot programme was launched in Missouri in the US that focused on parents as the child's first teachers. The 'Missouri' programme was predicated on research showing that working with the family, rather than bypassing the parents, is the most effective way of helping children get off to the best possible start in life. The four-year pilot study included 380 families who were about to have their first child and who represented a cross-section of socio-economic status, age and family configurations. They included single-parent and two-parent families, families in which both parents worked, and families with either the mother or father at home.

The programme involved trained parent-educators visiting the parents' home and working with the parent,

or parents, and the child. Information on child development, and guidance on things to look for and expect as the child grows were provided, plus guidance in fostering the child's intellectual, language, social and motor-skill development. Periodic check-ups of the child's educational and sensory development (hearing and vision) were made to detect possible handicaps that interfere with growth and development. Medical problems were referred to professionals.

Parent-educators made personal visits to homes and monthly group meetings were held with other new parents to share experience and discuss topics of interest. Parent resource centres, Located in school buildings, offered learning materials for families and facilitators for child care.

E

At the age of three, the children who had been involved in the 'Missouri' programme were evaluated alongside a cross-section of children selected from the same range of socio-economic backgrounds and family situations, and also a random sample of children that age. The results were phenomenal. By the age of three, the children in the programme were significantly more advanced in language development than their peers, had made greater strides in problem solving and other intellectual skills, and were further along in social development. In fact, the average child on the programme was performing at the level of the top 15 to 20 per cent of their peers in such things as auditory comprehension, verbal ability and language ability.

Most important of all, the traditional measures of 'risk', such as parents' age and education, or whether they were a single parent, bore little or no relationship to the measures of achievement and language development. Children in the programme performed equally well regardless of socio-economic disadvantages.

Child abuse was virtually eliminated. The one factor that was found to affect the child's development was family stress leading to a poor quality of parent-child interaction. That interaction was not necessarily bad in poorer families.

F

These research findings are exciting. There is growing evidence in New Zealand that children from poorer socio-economic backgrounds are arriving at school less well developed and that our school system tends to perpetuate that disadvantage. The initiative outlined above could break that cycle of disadvantage. The concept of working with parents in their homes, or at their place of work, contrasts quite markedly with the report of the Early Childhood Care and Education Working Group. Their focus is on getting children and mothers access to childcare and institutionalised early childhood education.

Education from the age of three to five is undoubtedly vital, but without a similar focus on parent education and on the vital importance of the first three years, some evidence indicates that it will not be enough to overcome educational inequity.

Questions 1-4

This reading passage has six sections, **A-F**.

Which paragraph contains the following information?

Write the correct letter A-F next to questions 1 to 4 below:

- 1 details of the range of family types involved in an education programme _____
- 2 reasons why a child's early years are so important _____
- 3 reasons why an education programme failed _____
- 4 a description of the positive outcomes of an education programme _____

Questions 5-10

Classify the following features as characterising

- A the 'Headstart' programme
- B the 'Missouri' programme
- C both the 'Headstart' and the 'Missouri' programmes
- D neither the 'Headstart' nor the 'Missouri' programme

Write the correct letter A, B, C or D in the space provided.

- 5 was administered to a variety of poor and wealthy families _____
- 6 continued with follow-up assistance in elementary schools _____
- 7 did not succeed in its aim _____
- 8 supplied many forms of support and training to parents _____
- 9 received insufficient funding _____
- 10 was designed to improve pre-schoolers' educational development _____

Questions 11-13

Do the following statements agree with the information given in **Reading Passage 1**?

In the spaces provided, write

- YES* if the statement agrees with the writer's claims
- NO* if the statement contradicts the writer's claims
- NOT GIVEN* if there is impossible to say what the writer thinks about this

- 11 Most 'Missouri' programme three-year-olds scored highly in areas such as listening, speaking, reasoning and interacting with others. _____
- 12 'Missouri' programme children of young, uneducated, single parents scored less highly on the tests. _____
- 13 The richer families in the 'Missouri' programme had higher stress levels. _____

READING PASSAGE 2

Nature or nurture?

- A A few years ago, in one of the most fascinating and disturbing experiments in behavioural psychology, Stanley Milgram of Yale University tested 40 subjects from all walks of life for their willingness to obey instructions given by a 'leader' in a situation in which the subjects might feel a personal distaste for the actions they were called upon to perform. Specifically, Milgram told each volunteer 'teacher-subject' that the experiment was in the noble cause of education, and was designed to test whether or not punishing pupils for their mistakes would have a positive effect on the pupils' ability to learn.
- B Milgram's experimental set-up involved placing the teacher-subjects before a panel of thirty switches with labels ranging from '15 volts of electricity (slight shock)' to '450 volts (danger – severe shock)' in steps of 15 volts each. The teacher-subject was told that whenever the pupil gave the wrong answer to a question, a shock was to be administered, beginning at the lowest level and increasing in severity with each successive wrong answer. The supposed 'pupil' was

in reality an actor hired by Milgram to simulate receiving the shocks by emitting a spectrum of groans, screams and writhings together with an assortment of statements and expletives denouncing both the experiment and the experimenter. Milgram told the teacher-subject to ignore the reactions of the pupil, and to administer whatever level of shock was called for, as per the rule governing the experimental situation of the moment.

- C As the experiment unfolded, the pupil would deliberately give the wrong answers to questions posed by the teacher, thereby bringing on various electrical punishments, even up to the danger level of 300 volts and beyond. Many of the teacher-subjects balked at administering the higher levels of punishment, and turned to Milgram with questioning looks and/or complaints about continuing the experiment. In these situations, Milgram calmly explained that the teacher-subject was to ignore the pupil's cries for mercy and carry on with the experiment. If the subject was still reluctant to proceed, Milgram said that it was important for the sake of the experiment that the procedure be followed through to the end. His final argument was, 'You have no other choice. You must go on.' What Milgram was trying to discover was the number of teacher-subjects who would be willing to administer the highest levels of shock, even in the face of strong personal and moral revulsion against the rules and conditions of the experiment.
- D Prior to carrying out the experiment, Milgram explained his idea to a group of 39 psychiatrists and asked them to predict the average percentage of people in an ordinary population who would be willing to administer the highest shock level of 450 volts. The overwhelming consensus was that virtually all the teacher-subjects would refuse to obey the experimenter. The psychiatrists felt that 'most subjects would not go beyond 150 volts' and they further anticipated that only four per cent would go up to 300 volts. Furthermore, they thought that only a lunatic fringe of about one in 1,000 would give the highest shock of 450 volts.
- E What were the actual results? Well, over 60 per cent of the teacher-subjects continued to obey Milgram up to the 450-volt limit! In repetitions of the experiment in other countries, the percentage of obedient teacher-subjects was even higher, reaching 85 per cent in one country. How can we possibly account for this vast discrepancy between what calm, rational, knowledgeable people predict in the comfort of their study and what pressurised, flustered, but cooperative 'teachers' actually do in the laboratory of real life?
- F One's first inclination might be to argue that there must be some sort of built-in animal aggression instinct that was activated by the experiment, and that Milgram's teacher-subjects were just following a genetic need to discharge this pent-up primal urge onto the pupil by administering the electrical shock. A modern hard-core sociobiologist might even go so far as to claim that this aggressive instinct evolved as an advantageous trait, having been of survival value to our ancestors in their struggle against the hardships of life on the plains and in the caves, ultimately finding its way into our genetic make-up as a remnant of our ancient animal ways.
- G An alternative to this notion of genetic programming is to see the teacher-subjects' actions as a result of the social environment under which the experiment was carried out. As Milgram himself pointed out, 'Most subjects in the experiment see their behaviour in a larger context that is benevolent and useful to society – the pursuit of scientific truth. The psychological laboratory has a strong claim to legitimacy and evokes trust and confidence in those who perform there. An action such as shocking a victim, which in isolation appears evil, acquires a completely different meaning when placed in this setting.'
- H Thus, in this explanation the subject merges his unique personality and personal and moral code with that of larger institutional structures, surrendering individual properties like loyalty, self-sacrifice and discipline to the service of malevolent systems of authority.
- I Here we have two radically different explanations for why so many teacher-subjects were willing to forgo their sense of personal responsibility for the sake of an institutional authority figure. The problem for biologists, psychologists and anthropologists is to sort out which of these two polar explanations is more plausible. This, in essence, is the problem of modern sociobiology – to discover the degree to which hard-wired genetic programming dictates, or at least strongly

biases, the interaction of animals and humans with their environment, that is, their behaviour. Put another way, sociobiology is concerned with elucidating the biological basis of all behaviour.

Questions 14-19

This reading passage has nine paragraphs, **A-I**.
Which paragraph contains the following information?
Write the correct letter A-I next to questions 1 to 6 below:

- 14 a biological explanation of the teacher-subjects behaviour _____
- 15 the explanation Milgram gave the teacher-subjects for the experiment _____
- 16 the identity of the pupils _____
- 17 the expected statistical outcome _____
- 18 the general aim of sociobiological study _____
- 19 the way Milgram persuaded the teacher-subjects to continue _____

Questions 20-22

Circle the correct letter in each question: A, B, C or D.

- 20 The teacher-subjects were told that they were testing whether
 - A a 450-volt shock was dangerous.
 - B punishment helps learning.
 - C the pupils were honest.
 - D they were suited to teaching.
- 21 The teacher-subjects were instructed to
 - A stop when a pupil asked them to.
 - B denounce pupils who made mistakes.
 - C reduce the shock level after a correct answer.
 - D give punishment according to a rule.
- 22 Before the experiment took place the psychiatrists
 - A believed that a shock of 150 volts was too dangerous.
 - B failed to agree on how the teacher-subjects would respond to instructions.
 - C underestimated the teacher-subjects' willingness to comply with experimental procedure.
 - D thought that many of the teacher-subjects would administer a shock of 450 volts.

Questions 23-26

Do the following statements agree with the information given in this reading passage?
In the space next to each statement, write

TRUE if the statement agrees with the information
FALSE if the statement contradicts the information
NOT GIVEN if there is no information on this

- 23 Several of the subjects were psychology students at Yale University. _____
- 24 Some people may believe that the teacher-subjects' behaviour could be explained as a positive survival mechanism. _____
- 25 In a sociological explanation, personal values are more powerful than authority. _____
- 26 Milgram's experiment solves an important question in sociobiology. _____

READING PASSAGE 3

The truth about the environment

For many environmentalists, the world seems to be getting worse. They have developed a hit-list of our main fears: that natural resources are running out; that the population is ever growing, leaving less and less to eat; that species are becoming extinct in vast numbers, and that the planet's air and water are becoming ever more polluted.

But a quick look at the facts shows a different picture. First, energy and other natural resources have become more abundant, not less so, since the book 'The limits to Growth' was published in 1972 by a group of scientists. Second, more food is now produced per head of the world's population than at any time in history. Fewer people are starving. Third, although species are indeed becoming extinct, only about 0.7% of them are expected to disappear in the next 50 years, not 25-50%, as has so often been predicted. And finally, most forms of environmental pollution either appear to have been exaggerated, or are transient – associated with the early phases of industrialisation and therefore best cured not by restricting economic growth, but by accelerating it. One form of pollution – the release of greenhouse gases that causes global warming – does appear to be a phenomenon that is going to extend well into our future, but its total impact is unlikely to pose a devastating problem. A bigger problem may well turn out to be an inappropriate response to it.

Yet opinion polls suggest that many people nurture the belief that environmental standards are declining and four factors seem to cause this disjunction between perception and reality.

One is the lopsidedness built into scientific research. Scientific funding goes mainly to areas with many problems. That may be wise policy but it will also create an impression that many more potential problems exist than is the case.

Secondly, environmental groups need to be noticed by the mass media. They also need to keep the money rolling in. Understandably, perhaps, they sometimes overstate their arguments. In 1997, for example, the World Wide Fund for Nature issued a press release entitled: 'Two thirds of the world's forests lost forever'. The truth turns out to be nearer 20%.

Though these groups are run overwhelmingly by selfless folk, they nevertheless share many of the characteristics of other lobby groups. That would matter less if people applied the same degree of scepticism to environmental lobbying as they do to lobby groups in other fields. A trade organisation arguing for, say, weaker pollution control is instantly seen as self-interested. Yet a green organisation opposing such a weakening is seen as altruistic, even if an impartial view of the controls in question might suggest they are doing more harm than good.

A third source of confusion is the attitude of the media. People are clearly more curious about bad news than good. Newspapers and broadcasters are there to provide what the public wants. That, however, can lead to significant distortions of perception. An example was America's encounter with El Nino in 1997 and 1998. This climatic phenomenon was accused of wrecking tourism, causing allergies, melting the ski-slopes, and causing 22 deaths. However, according to an article in the Bulletin of the American Meteorological Society, the damage it did was estimated at US\$4 billion but the benefits amounted to some US\$19 billion. These came from higher winter temperatures (which saved an estimated 850 lives, reduced heating costs and diminished spring floods caused by meltwaters).

The fourth factor is poor individual perception. People worry that the endless rise in the amount of stuff everyone throws away will cause the world to run out of places to dispose of waste. Yet, even if America's trash output continues to rise as it has done in the past, and even if the American population doubles by 2100, all the rubbish America produces through the entire 21st century will still take up only one-12,000th of the area of the entire United States.

So what of global warming? As we know, carbon dioxide emissions are causing the planet to warm. The best estimates are that the temperatures will rise by 2-3°C in this century, causing considerable problems, at a total cost of US\$5,000 billion.

Despite the intuition that something drastic needs to be done about such a costly problem, economic analyses clearly show it will be far more expensive to cut carbon dioxide emissions radically than to

pay the costs of adaptation to the increased temperatures. A model by one of the main authors of the United Nations Climate Change Panel shows how an expected temperature increase of 2.1 degrees in 2100 would only be diminished to an increase of 1.9 degrees. Or to put it another way, the temperature increase that the planet would have experienced in 2094 would be postponed to 2100.

So this does not prevent global warming, but merely buys the world six years. Yet the cost of reducing carbon dioxide emissions, for the United States alone, will be higher than the cost of solving the world's single, most pressing health problem: providing universal access to clean drinking water and sanitation. Such measures would avoid 2 million deaths every year, and prevent half a billion people from becoming seriously ill.

It is crucial that we look at the facts if we want to make the best possible decisions for the future. It may be costly to be overly optimistic – but more costly still to be too pessimistic.

Questions 27-32

Do the following statements agree with the information given in **Reading Passage 3**?

In the space next to each statement, write

- | | |
|-----------|--|
| YES | <i>if the statement agrees with the writer's claims</i> |
| NO | <i>if the statement contradicts the writer's claims</i> |
| NOT GIVEN | <i>if there is impossible to say what the writer thinks about this</i> |

- 27 Environmentalists take a pessimistic view of the world for a number of reasons. _____
- 28 Data on the Earth's natural resources has only been collected since 1972. _____
- 29 The number of starving people in the world has increased in recent years. _____
- 30 Extinct species are being replaced by new species. _____
- 31 Some pollution problems have been correctly linked to industrialisation. _____
- 32 It would be best to attempt to slow down economic growth. _____

Questions 33-37

Circle the correct letter in each question: A, B, C or D.

- 33 What aspect of scientific research does the writer express concern about in paragraph 4?
- A the need to produce results
 - B the lack of financial support
 - C the selection of areas to research
 - D the desire to solve every research problem
- 34 The writer quotes from the Worldwide Fund for Nature to illustrate how
- A influential the mass media can be.
 - B effective environmental groups can be.
 - C the mass media can help groups raise funds.
 - D environmental groups can exaggerate their claims.
- 35 What is the writer's main point about lobby groups in paragraph 6?
- A Some are more active than others.
 - B Some are better organised than others.
 - C Some receive more criticism than others.
 - D Some support more important issues than others.

- 36 The writer suggests that newspapers print items that are intended to
- A educate readers.
 - B meet their readers' expectations.
 - C encourage feedback from readers.
 - D mislead readers.
- 37 What does the writer say about America's waste problem?
- A It will increase in line with population growth.
 - B It is not as important as we have been led to believe .
 - C It has been reduced through public awareness of the issues.
 - D It is only significant in certain areas of the country.

Questions 38-40

Complete the summary with the most appropriate word in each case from the box below.

Write the letter A-I in each space.

GLOBAL WARMING

The writer admits that global warming is a **38** _____ challenge, but says that it will not have a catastrophic impact on our future, if we deal with it in the **39** _____ way. If we try to reduce the levels of greenhouse gases, he believes that it would only have a minimal impact on rising temperatures. He feels it would be better to spend money on the more **40** _____ health problem of providing the world's population with clean drinking water.

A unrealistic	B agreed	C expensive	D right
E long-term	F usual	G surprising	H personal
I urgent			

Appendix J: IELTS writing test

Name: _____ Wits person no.: _____

Email address: _____

Academic IELTS test

Writing section

You have 40 minutes for this writing task.

Write about the following topic:

*Some people believe that a university education should be available to all students.
Others believe that higher education should be available only to good students.
Discuss these views. Which view do you agree with? Explain why.*

Give reasons for your answer and include any relevant examples from your own knowledge or experience.

Write at least 250 words.

Appendix K: Receptive vocabulary test

Name: _____

Wits person no.: _____

Email address: _____

Vocabulary test

Match each test item to the most appropriate synonym given in 1 - 6:

The 2000 word level

- | | | | |
|-----------|-------------------------------------|-------------|---|
| 1. copy | | 1. accident | |
| 2. event | _____ end or highest point | 2. debt | _____ loud deep sound |
| 3. motor | _____ this moves a car | 3. fortune | _____ having a high opinion of yourself |
| 4. pity | _____ thing made to be like another | 4. pride | _____ something you must pay |
| 5. profit | | 5. roar | |
| 6. tip | | 6. thread | |

- | | | | |
|------------|--------------------------------------|------------|-------------------------------------|
| 1. coffee | | 1. arrange | |
| 2. disease | _____ money for work | 2. develop | _____ grow |
| 3. justice | _____ a piece of clothing | 3. lean | _____ put in order |
| 4. skirt | _____ using the law in the right way | 4. owe | _____ like more than something else |
| 5. stage | | 5. prefer | |
| 6. wage | | 6. seize | |

- | | | | |
|------------|----------------------|----------------|-------------------------|
| 1. clerk | | 1. blame | |
| 2. frame | _____ a drink | 2. elect | _____ make |
| 3. noise | _____ office worker | 3. jump | _____ choose by voting |
| 4. respect | _____ unwanted sound | 4. threaten | _____ become like water |
| 5. theatre | | 5. melt | |
| 6. wine | | 6. manufacture | |

- | | | | |
|----------------|------------------------------------|--------------|----------------------|
| 1. dozen | | 1. ancient | |
| 2. empire | _____ chance | 2. curious | _____ not easy |
| 3. gift | _____ twelve | 3. difficult | _____ very old |
| 4. tax | _____ money paid to the government | 4. entire | _____ related to God |
| 5. relief | | 5. holy | |
| 6. opportunity | | 6. Social | |

- | | | | |
|--------------|--------------------------------------|----------------|----------------------------|
| 1. admire | | 1. slight | |
| 2. complain | _____ make wider or longer | 2. bitter | _____ beautiful |
| 3. fix | _____ bring in for the first time | 3. lovely | _____ small |
| 4. hire | _____ have a high opinion of someone | 4. merry | _____ liked by many people |
| 5. introduce | | 5. popular | |
| 6. stretch | | 6. independent | |

The 3000 word level

- | | | | |
|-------------|---|---------------|----------------------------------|
| 1. bull | | 1. muscle | |
| 2. champion | _____ formal and serious manner | 2. counsel | _____ advice |
| 3. dignity | _____ winner of a sporting event | 3. factor | _____ female chicken |
| 4. hell | _____ building where valuable objects are shown | 4. hen | _____ a place covered with grass |
| 5. museum | | 5. lawn | |
| 6. solution | | 6. atmosphere | |
-
- | | | | |
|---------------|----------------------------------|------------|-----------------------------------|
| 1. blanket | | 1. abandon | |
| 2. contest | _____ holiday | 2. dwell | _____ live in a place |
| 3. generation | _____ good quality | 3. oblige | _____ follow in order to catch |
| 4. merit | _____ wool covering used on beds | 4. pursue | _____ leave something permanently |
| 5. plot | | 5. quote | |
| 6. vacation | | 6. resolve | |

1. comment
2. gown _____ long formal dress
3. imports _____ goods from a foreign country
4. nerve _____ part of the body which carries
5. pasture _____ feeling
6. tradition

1. pond
2. angel _____ group of animals
3. frost _____ spirit who serves God
4. herd _____ managing business and affairs
5. fort
6. administration

1. brilliant
2. distinct _____ thin
3. magic _____ steady
4. naked _____ without clothes
5. slender
6. stable

1. assemble
2. attach _____ look closely
3. peer _____ stop doing something
4. quit _____ cry out loudly in fear
5. scream
6. toss

1. drift
2. endure _____ suffer patiently
3. grasp _____ join wool threads
4. knit _____ together
5. register _____ hold firmly with your hands
6. tumble

1. aware
2. blank _____ usual
3. desperate _____ best or most important
4. normal _____ knowing what is happening
5. striking
6. supreme

Academic vocabulary

1. area
2. contract _____ written agreement
3. definition _____ way of doing something
4. evidence _____ reason for believing something
5. method _____ is or is not true
6. role

1. debate
2. exposure _____ plan
3. integration _____ choice
4. option _____ joining something into a whole
5. scheme
6. stability

1. access
2. gender _____ male or female
3. licence _____ study of language
4. linguistics _____ entrance or way in
5. orientation
6. implementation

1. edition
2. guarantee _____ collecting things over time
3. media _____ promise to repair a broken product
4. motivation _____ feeling a strong reason or need to do something
5. phenomenon
6. accumulation

1. explicit
2. sole _____ last
3. final _____ stiff
4. rigid _____ meaning 'no' or 'not'
5. negative
6. professional

1. adult
2. vehicle _____ end
3. schedule _____ machine used to move people or goods
4. exploitation _____ list of things to do at certain times
5. termination
6. infrastructure

1. alter
2. coincide _____ change
3. deny _____ say something is not true
4. devote _____ describe clearly and exactly
5. release
6. specify

1. correspond
2. diminish _____ keep
3. Emerge _____ match or be in agreement with
4. invoke _____ give special attention to something
5. retain
6. highlight

1. bond
2. channel _____ make smaller
3. estimate _____ guess the number or size of something
4. identify _____ recognising and naming a person or thing
5. mediate
6. minimize

1. abstract
2. adjacent _____ next to
3. neutral _____ added to
4. global _____ concerning the whole world
5. controversial
6. supplementary

The 5000 word level

- | | | | |
|----------------|--|----------------|--|
| 1. analysis | | 1. artillery | |
| 2. curb | _____ eagerness | 2. creed | _____ a kind of tree |
| 3. gravel | _____ loan to buy a house | 3. hydrogen | _____ system of belief |
| 4. mortgage | _____ small stones mixed with sand | 4. maple | _____ large gun on wheels |
| 5. scar | | 5. pork | |
| 6. zeal | | 6. streak | |
| | | | |
| 1. cavalry | | 1. chart | |
| 2. eve | _____ small hill | 2. forge | _____ map |
| 3. ham | _____ day or night before a holiday | 3. mansion | _____ large beautiful house |
| 4. mound | _____ soldiers who fight from horses | 4. outfit | _____ place where metals are made and shaped |
| 5. steak | | 5. sample | |
| 6. switch | | 6. volunteer | |
| | | | |
| 1. circus | | 1. revive | |
| 2. jungle | _____ musical instrument | 2. extract | _____ think about deeply |
| 3. trumpet | _____ seat without a back or arms | 3. gamble | _____ bring back to health |
| 4. sermon | _____ speech given by a priest in a church | 4. launch | _____ make someone angry |
| 5. stool | | 5. provoke | |
| 6. nomination | | 6. contemplate | |
| | | | |
| 1. shatter | | 1. decent | |
| 2. embarrass | _____ have a rest | 2. frail | _____ weak |
| 3. heave | _____ break suddenly into small pieces | 3. harsh | _____ concerning a city |
| 4. relax | _____ make someone feel shy or nervous | 4. incredible | _____ difficult to believe |
| 5. obscure | | 5. municipal | |
| 6. demonstrate | | 6. specific | |
| | | | |
| 1. correspond | | 1. adequate | |
| 2. embroider | _____ exchange letters | 2. internal | _____ enough |
| 3. penetrate | _____ hide and wait for someone | 3. mature | _____ fully grown |
| 4. prescribe | _____ feel angry about something | 4. profound | _____ alone away from other things |
| 5. resent | | 5. solitary | |
| 6. lurk | | 6. tragic | |

The 10 000 word level

- | | | | |
|---------------|--|----------------|--|
| 1. alabaster | | 1. throttle | |
| 2. tentacle | _____ small barrel | 2. convoy | _____ kindness |
| 3. dogma | _____ soft white stone | 3. lien | _____ set of musical notes |
| 4. keg | _____ tool for shaping wood | 4. octave | _____ speed control for an engine |
| 5. rasp | | 5. stint | |
| 6. chandelier | | 6. benevolence | |
| | | | |
| 1. bourgeois | | 1. scrawl | |
| 2. brocade | _____ middle class people | 2. cringe | _____ write carelessly |
| 3. consonant | _____ row or level of something | 3. immerse | _____ move back because of fear |
| 4. prelude | _____ cloth with a pattern or gold or silver threads | 4. peek | |
| 5. stupor | | 5. contaminate | _____ put something under water |
| 6. tier | | 6. Relay | |
| | | | |
| 1. alcove | | 1. blurt | |
| 2. impetus | _____ priest | 2. dent | _____ walk in a proud way |
| 3. maggot | _____ early release from prison | 3. dabble | _____ say suddenly without thinking |
| 4. parole | _____ medicine to put on wounds | 4. pacify | |
| 5. salve | | 5. strangle | _____ kill by squeezing someone's throat |
| 6. vicar | | 6. swagger | |
| | | | |
| 1. alkali | | 1. illicit | |
| 2. banter | _____ light joking talk | 2. lewd | _____ immense |
| 3. coop | _____ a rank of British nobility | 3. slick | _____ against the law |
| 4. mosaic | _____ picture made of small pieces of glass or stone | 4. temporal | _____ wanting revenge |
| 5. stealth | | 5. mammoth | |
| 6. viscount | | 6. vindictive | |

1. dissipate
2. flaunt _____ steal
3. impede _____ scatter or vanish
4. loot _____ twist the body about
5. squirm _____ uncomfortably
6. vie

1. indolent
2. nocturnal _____ lazy
3. obsolete _____ no longer used
4. torrid _____ clever and tricky
5. translucent
6. wily

Appendix L: Productive vocabulary test

Name: _____

Wits person no.: _____

Email address: _____

Vocabulary test⁶⁷

In each sentence below, the first few letters of a word have been given. Please complete each of these words in the space provided.

Thank you for your time,

Trish Cooper

⁶⁷ Laufer and Nation (1999)

The 5000 word level

1. Soldiers usually swear an oath_____ of loyalty to their country.
2. The voter placed the ballot_____ in the box.
3. They keep their valuables in a vault_____ at the bank.
4. A bird perched at the window ledge_____.
5. The thieves have forced an entrance_____ into the building.
6. The small hill was really a burial mound_____.
7. We decided to celebrate New Year's Eve_____ together.
8. This is a complex problem that is difficult to comprehend_____.
9. The angry crowd shouted_____ the prisoner as he was leaving the court.
10. Don't pay attention to this rude remark. Just ignore_____ it.
11. The management held a secret meeting. The issues discussed were not disclosed_____ to the workers.
12. We do not have adequate_____ information to make a decision.
13. She is not a child, but a mature_____ woman. She can make her own decisions.
14. The prisoner was put in solitary_____ confinement.
15. Some people find it hard to be independent. They prefer to be tied to their mother's apron_____ strings.
16. After finishing his degree, he entered a new phase_____ in his career.
17. The workmen cleaned up the mess_____ before they left.
18. I saw them sitting on stools_____ at the bar drinking beer.
19. The building is heated by a modern heating apparatus_____.
20. He received many compliments_____ on his dancing skills.
21. People manage to buy houses by raising a mortgage_____ from a bank.
22. At the bottom of the blackboard there is a ledge_____ for chalk.
23. After falling off his bicycle, the boy was covered with bruises_____.
24. The child was holding a doll in her arms and hugging_____ it.
25. We'll have to be inventive and devise_____ a scheme for earning more money.
26. The picture looks nice; the colours blend_____ really well.
27. Nuts and vegetables are considered wholesome_____ food.
28. Many gardens are full of fragrant_____ flowers.
29. Many people feel depressed and gloom_____ about the future of mankind.
30. He is so depressed that he is contemplating_____ suicide.

Academic vocabulary

1. There has been a recent tr_____ among prosperous families toward a smaller number of children.
2. The ar_____ of his office is 25 square metres.
3. According to the communist doc_____, workers should rule the world.
4. He usually read the sports sec_____ of the newspaper first.
5. Because of the doctors' strike, the cli_____ is closed today.
6. There are several misprints on each page of this te_____.
7. They insp_____ all products before sending them out to stores.
8. A considerable amount of evidence was accum_____ during the investigation.
9. He is irresponsible. You cannot re_____ on him for help.
10. It's impossible to eva_____ these results without knowing about the research methods that were used.
11. He's finally att_____ a position of power in the company.
12. The story tells about a crime and subs_____ punishment.
13. In a hom_____ class all students are of a similar proficiency.
14. The urge to survive is inh_____ in all creatures.
15. I've had my eyes tested and the optician says my vi_____ is good.
16. The anom_____ of his position is that he is chairman of the committee, but isn't allowed to vote.
17. In their geography class, the children are doing a special pro_____ on North America.
18. A true dem_____ should ensure equal rights and opportunities for all citizens.
19. The drug was introduced after medical res_____ indisputably proved its effectiveness.
20. These courses should be taken in seq_____, not simultaneously.
21. Despite his physical condition, his int_____ was unaffected.
22. Governments often cut budgets in times of financial cri_____.
23. The job sounded interesting at first, but when he realised what it involved, his excitement sub_____.
24. Research ind_____ that men find it easier to give up smoking than women.
25. In a lecture, a lecturer does most of the talking. In a seminar, students are expected to part_____ in the discussion.
26. The airport is far away. If you want to en_____ that you catch your plane, you'll have to leave early.
27. It's difficult to ass_____ a person's true knowledge by one or two tests.
28. The new manager's job was to res_____ the company to its former profitability.
29. His decision to leave home was not well thought out. It was not based on rat_____ considerations.
30. The challenging job required a strong, successful and dyn_____ candidate.

The 10 000 word level

1. The prisoner was released on par_____.
2. Second year university students in the US are called soph_____.
3. The insect causes damage to plants by its toxic sec_____.
4. The evacu_____ of the building saved many lives.
5. For many people, wealth is a prospect of unimaginable felic_____.
6. She found herself in a pred_____ without any hope of a solution.
7. Some coal was still smoul_____ among the ashes.
8. The dead bodies were mutil_____ beyond recognition.
9. She was sitting on a balcony and bas_____ in the sun.
10. For years waves of invaders pill_____ towns along the coast.
11. The rescue attempt could not proceed quickly. It was imp_____ by bad weather.
12. I wouldn't hire him. He is unmotivated and indo_____.
13. Computers have made type-writers old-fashioned and obs_____.
14. Watch out for his wil_____ tricks.
15. If your lips are sore, try lip sal_____, not medicine.
16. Much to his chag_____, he was not offered the job.
17. The actors exchanged ban_____ with the reporters.
18. The floor in the ballroom was a mos_____ of pastel colours.
19. She has contributed a lot of money to various charities. She is known for her generosity and bene_____.
20. This is an unusual singer with a range of three oct_____.
21. A thro_____ controls the flow of petrol into an engine.
22. Anyone found loo_____ bombed houses and shops will be severely punished.
23. The crowd soon disp_____ when the police arrived.
24. The wounded man squi_____ on the floor in agony.
25. The dog crin_____ when it saw the snake.
26. He imme_____ himself in a hot bubbly bath, forgetting all his troubles for a moment.
27. The approaching storm stam_____ the cattle into running wildly.
28. The problem is beginning to assume mam_____ proportions.
29. His vind_____ towards the thief was understandable.
30. He was arrested for illi_____ trading in drugs.

Appendix M: Demographic survey

Consent form

I agree to participate in the study on language and academic performance being conducted by Trish Cooper.

In giving consent, I agree to complete a questionnaire on my language and educational background with the understanding that all information provided will remain confidential.

I understand that

- participation in this study is voluntary and will have no bearing on my own studies.
- I am free to discontinue participation at any time without prejudice.
- no information that could be used to identify me will be included in the research report.

Participant's name (in full)

Signature

Wits person number

Date

Trish Cooper
Researcher's name

Signature

Questionnaire

Section A: Personal information

1. Name: _____
2. Wits person no. _____
3. Gender: Male Female *(Please tick ✓)*
4. Age: _____ years
5. Nationality: _____
6. Are you planning to continue with third year Psychology? Yes No

Section B: Language background

1. First language: _____
2. English is my _____ language. *(Please tick ✓ the appropriate box below)*
 first second third fourth other
3. Do you speak English at home? Yes No
4. What other language(s) are spoken in your home?

Section C: Educational background

1. What is your highest educational qualification?

Matric⁶⁸

Diploma

Undergraduate degree

Other (*please specify*) _____

2. In what year did you obtain your matriculation certificate / complete your last year of school? _____

3. At what school did you matriculate (complete your schooling)?

Name of school: _____

City / Town: _____ Country: _____

4. What was the language of learning and teaching at your primary / junior school?

5. What was the language of learning and teaching at your high / senior school?

6. What language(s) did you study at school?

⁶⁸ Matric is the final year of secondary school

The following questions should be answered only by students who are NON SA CITIZENS and who speak ENGLISH AS A FOREIGN LANGUAGE, for example, students from Angola, Mozambique, the DRC and China:

1. When did you come to South Africa? Month _____ Year _____

2. Did you live in an English-speaking country before SA? Yes No

If yes, where did you live and for how long?

3. How many years have you studied English? _____ years

4. Did you study English at school? Yes No

5. Did you study English after completing your final year of school? Yes No

If yes, where did you study and for how long?

6. Have you written the IELTS exam? Yes No

If yes, where did you write the exam? _____

What scores did you obtain for each of the following sections:

Reading Writing Listening Speaking

What was your overall score? _____

Did you attend IELTS preparation classes before writing the exam? Yes No

Thank you for your time and input. 😊

Appendix N: Email request for an interview

From: Trish Cooper <Trish.Cooper@wits.ac.za>

Date: Tue, 15 Oct 2013 15:56:09 +0000

To: 000000@students.wits.ac.za<550420@students.wits.ac.za>

Subject: closing interview

Dear _____

I'd like to thank you for all your support over the last three years. It's thanks to all your contributions to my PhD that I have made significant progress, and I would definitely not be hoping to finish within the next two or three years without all the help you've given.

I'm writing with a last request before you leave Wits or move on to postgraduate studies. Could you please let me have about 45 minutes of your time for a final vocabulary test and short interview? If you can come to Wits Language School at the Professional Development Hub (on the edge of the Wits campus, corner of Jan Smuts avenue and Empire Road – Gate 06), I will provide you with coffee, tea or fruit juice and something to eat (a sandwich, muffin or piece of cake).

The research that you have helped me with is going to be extremely valuable to students in the future, and I would be very grateful indeed if I could meet you for the last time. I know you're writing exams soon and are currently busy with the final deadlines for the year, but if you think you'd like a break at any stage, this would give you an opportunity to get some exercise walking down to the PDH and a chance for a snack.

If you can come at any stage before Friday, 6 December, please let me know what date and time would suit you. I'll do my best to make sure I'm available and will send you clear directions on how to walk or drive here. (I'm away on 4 and 5 November, but will otherwise be here.)

I hope to hear from you soon.

I wish you all the very best for the remainder of the academic year,

Trish

Appendix O: Semi-structured interview with model answers

Questionnaire consent form

I agree to participate in the study on writing and academic performance being conducted by Trish Cooper.

In giving consent, I agree to complete the tests and be interviewed based on the understanding that all information provided will remain confidential.

I understand that

- participation in this study is voluntary and will have no bearing on my own studies.
- I am free to discontinue participation at any time without prejudice.
- no information that could be used to identify me will be included in the research report.

Name and surname

Signature

Wits person number

Date

Trish Cooper
Researcher's name

Signature

Questionnaire

Section A: Personal information

7. Name: _____
8. Wits person no. _____
9. Gender: Male Female (Please tick ✓)
10. Age: _____ years
11. Nationality: _____
12. First language: _____
13. English is my _____ language. (Please tick ✓ the appropriate box below)
- first second third fourth other

Interview procedure

Introduce myself and provide a broad outline of the study:

My name is Trish Cooper. You will have met me before as I've been working with your cohort of psychology students from your first year in 2011. As you know, in addition to asking you to complete the IELTS reading and writing tests and some vocabulary tests, I've been collecting the psychology assignments produced by all the students in your group and so have built up a collection of student writing. I'm comparing the writing in these assignments to professional writing in psychology journals in order to see how student writing differs from professional writing. The aim is to be able to give advice to students on the basis of the differences found so that they can improve their writing skills. The focus of this study is on aspects of vocabulary.

I would like to ask you to complete a few short test questions on aspects of vocabulary below, and then to answer a few interview questions. It should not take longer than 45 minutes.

Section B: Vocabulary test

A In each sentence below, the first few letters of a word have been given. Please complete each of these words in the space provided.

1. There has been a recent trend among prosperous families toward a smaller number of children.
2. The area of his office is 25 square metres.
3. According to the communist doctrine, workers should rule the world.
4. He usually reads the sports section of the newspaper first.
5. Because of the doctors' strike, the clinic is closed today.
6. There are several misprints on each page of this text.
7. They inspect all products before sending them out to stores.
8. A considerable amount of evidence was accumulated during the investigation.
9. He is irresponsible. You cannot rely on him for help.
10. It's impossible to evaluate these results without knowing about the research methods that were used.
11. He's finally attained a position of power in the company.
12. The story tells about a crime and subsequent punishment.
13. In a homogeneous class all students are of a similar proficiency.
14. The urge to survive is inherent in all creatures.
15. I've had my eyes tested and the optician says my vision is good.
16. The anomaly of his position is that he is chairman of the committee, but isn't allowed to vote.
17. In their geography class, the children are doing a special project on North America.
18. A true democracy should ensure equal rights and opportunities for all citizens.
19. The drug was introduced after medical research indisputably proved its effectiveness.
20. These courses should be taken in sequence, not simultaneously.
21. Despite his physical condition, his intellect was unaffected.
22. Governments often cut budgets in times of financial crisis.
23. The job sounded interesting at first, but when he realised what it involved, his excitement subsided.
24. Research indicates that men find it easier to give up smoking than women.
25. In a lecture, a lecturer does most of the talking. In a seminar, students are expected to participate in the discussion.
26. The airport is far away. If you want to ensure that you catch your plane, you'll have to leave early.
27. It's difficult to assess a person's true knowledge by one or two tests.
28. The new manager's job was to restore the company to its former profitability.
29. His decision to leave home was not well thought out. It was not based on rational considerations.
30. The challenging job required a strong, successful and dynamic candidate.

B Complete each of the following sentences with the most suitable phrase from the box. There are more phrases in the box (i.e. 16) than sentences requiring completion (i.e. 8). Each phrase can only be used once.

in the sense that	in the case of	in the absence of	in the face of
due to the fact	at the end of	on the basis of	one of the most
in the context of	the nature of the	the rest of the	it is possible that
is based on the	it has been found	as a result of	in addition to the

1. Traditional gender ideology defines a woman's responsibilities mainly _____ being a mother and housewife rather than occupational roles. [on the basis of] **framing**
2. For those young people who flee to new cultures and countries _____ conflict or disaster, acculturation and language skills have been linked to better adaptation over time. [as a result of] **resultative**
3. Resilience is the successful coping with or overcoming risk and adversity, development of competence _____ severe stress and hardship, and success in developmental tasks or meeting societal expectations, as reflected in overt, behavioural indices. [in the face of] **framing**
4. These deaths, which are associated with the use of firearms or sharp objects and fighting between men, occur _____ entertainment linked to alcohol consumption. Alcohol-related violence frequently occurs in public spaces and peaks over recreational periods, including weekends and festive periods. [in the context of] **framing**
5. Human society does not function well _____ a sense of moral purpose and a cooperative stance toward others. [in the absence of] **framing**
6. Family economic status, family structure, parents' educational levels, and ethnic group are not only correlated in the population; they are also causally interrelated _____ they affect one another. [in the sense that] **framing**
7. Trauma-related difficulties pertain to the intricate manner in which individuals interpret or construct events. It is not necessarily _____ event which determines vulnerability to symptomology, but its meaning for the individual. [the nature of the] **description**
8. Cigarette smoking among adolescents remains _____ important public health challenges. [one of the most] **quantification**

C Complete each of the following sentences with the most suitable phrase from the box. There are more phrases in the box (i.e. 16) than sentences requiring completion (i.e. 8). Each phrase can only be used once.

in the case of	is based on the	in the presence of	there is evidence that
due to the fact	to the extent that	in line with the	when it comes to
as part of the	it is responsible for	the way in which	on the other hand
as well as the	it is important to	are less likely to	is consistent with the

1. Collectively, factors such as opportunities and intentions represent people's actual control over behaviour. _____ a person has the required opportunities and resources, and intends to perform the behaviour, he or she should succeed in doing so. [to the extent that] **framing**
2. Schools should incorporate cultural competence in their prevention strategies by addressing the issues of culture _____ intervention, so that culture becomes an asset to be enhanced. [as part of the] **location**
3. Previous research has shown that European American teens _____ be the target of ethnic bias than are African American or Latino teens. [are less likely to] **description**
4. There is also evidence that the attitudes displayed towards eating behaviours and body image in one's community will affect _____ one views the self. [the way in which] **procedure**
5. Cognitive theories that account for eating disorders seem to stem from the fact that anorexics and bulimics have distorted mental cognitions _____ body image, weight and shape. [when it comes to] **framing**
6. Because the collectivist culture places greater importance on the welfare of the group than the individual, _____ focus on self-issues in therapy, such as self-development and independence. [it is important to] **engagement**
7. The theory of planned behaviour is a useful model as it incorporates the individual's beliefs _____ influence of the social world on these beliefs. [as well as the] **transition**
8. In line with theory and research, one might expect women to be more extroverted than men. _____, extroversion is related to greater sexual promiscuity, which should be more adaptive for men than for women according to evolutionary theories. [on the other hand] **transition**

D In each of the following sentences, a word or phrase is underlined. Each of these underlined words or phrases contains one or more mistakes. Give the correct form in each case.

1. The 72 hour period is the maximum that a person can be admitted on an involuntary basis for purposes of psychiatric examination.

for the purpose of

2. All interviews were videotaped throughout the cause of the study so that interrater reliability could be could be monitored.

the course of the

3. We appreciate that there is a large political constituency in the United States that embraces a robust military budget because it believes that the best way to ensure peace is through military strength. In the same time, militarism produces enormous profits for weapons developers and drains resources from other sectors of the economy that could satisfy human needs more productively and equitably.

At the same time

4. In South Africa, there are various ways in which one could describe oneself to another person on the terms of the following attributes: age; gender; being South African; being Zulu, English, Sotho, Afrikaans, or Xhosa; being Black, White, Indian, or Coloured; and so on.

in terms of the

5. Our findings are silent respecting to the question of whether gender differences in the variables we studied are caused primarily by biological factors or experience.

with respect to the

6. One of the dimensions of openness about sex and sexuality is an acceptance that over the course of a lifetime most people will have multiple sexual partners. Concurrency has a special place in traditional African society in the shape of polygamous marriage, but the practice clearly extends well beyond marriage.

in the form of

7. The challenge then is how to maintain a balance between concerns about the suffering of others on the first hand, and professional integrity on the other.

on the one hand

8. These findings suggest that in addition to characterizing relative rates of violent acts, researchers should attempt to understand how such rates may change as functions of age, duration, status of relationship, and the relation of gender identity to these characteristics.

as a function of

9. Health locus of control is the measure to which people believe that they themselves, powerful others or chance influence their health and sickness.

the degree to which

10. Not surprisingly, positive family relationships have been found to associate with reduced alcohol use and reduced violent victimization.

to be associated with

Section C: Interview questions

Did you find writing assignments challenging when you first started your university studies?

[If yes] What was particularly difficult about writing assignments?

Was there anything about writing that you did not find difficult?

Has writing assignments become easier? If yes, in what way?

You have been required to read both text books and articles from psychology journals. Which aspects of the language of journal articles present comprehension problems when you read?

Are there certain words or phrases you find difficult to understand?

If yes, are these words or phrases usually technical terms or more general, academic terms?

Do you think that the way in which you write has been influenced in any way by your reading of textbooks and journal articles? If yes, in what way?

One of the things that I'm focusing on is phrases or clusters of words such as '*on the other hand*', '*as well as the*' and '*as a result of*'. Are you aware of using such phrases in your writing?

[If yes] Are you aware of a difference in the use of such phrases in your own writing and the texts written by professionals, such as textbooks and journal articles?

[If yes] In what way do you think your use of such phrases has developed from your first year to your third year?

In terms of your academic experience, how do you feel now as a third year student as opposed to your first year? What do you think you've learnt in terms of writing?

Have you enjoyed your university experience? [If yes] What in particular have you enjoyed about it?

Thank you for your time and input. ☺

Appendix P: Average percentage of AWL tokens in each essay

PSY100 essays	No. of essays in corpus	Addition of AWL percentages	Average percentage of AWL items per essay
PSY100 May	155	1 346.33	8.69
PSY100 Aug	157	1 624.74	10.35
PSY100 Sep	159	2 105.88	13.24
Overall average for PSY100			10.76
PSY200 Mar	157	1 775.09	11.31
PSY200 May	159	1 290.64	8.12
PSY200 Aug	159	1 724.56	10.85
PSY200 Oct	144	1 421.54	9.87
Overall average for PSY200			10.04
PSY3001	77	736.68	9.57
PSY3013	52	617.09	11.87
PSY3015	54	523.98	9.70
PSY3016	40	440.72	11.02
PSY3017	52	575.37	11.06
PSY3018	38	425.75	11.20
PSY3019	21	272.59	12.98
PSY3020	36	373.72	10.38
PSY3021	49	583.10	11.90
PSY3022	44	333.36	7.57
PSY3023	47	602.57	12.82
PSY3034	75	787.42	10.50
Overall average for PSY300			10.88

Table A-4.1: Percentage of academic vocabulary items used in the PSY100, PSY200 and PSY300 essays (§4.2.1.1)

Appendix Q: Complete results of the independent samples t-test for density of academic vocabulary use by L1 and AL students

	Levene's Test for Equality of Variances ⁶⁹		t-test for Equality of Means					
	F	Sig.	t	df	Sig. (2-tailed)	Mean difference	95% Confidence interval of the difference	
							Lower	Upper
AWL averages for PSY100*	.690	.407	1.023	158	.308	.273	-.254	.799
AWL averages for PSY200*	.087	.769	3.328	158	.001	1.160	.472	1.849
AWL averages for PSY300*	.013	.910	2.856	158	.005	.752	.232	1.273

* Equal variances assumed

Table A - 4.2: Results of the independent samples t-test for density of academic vocabulary use by L1 and AL students within first year, second year and third year (§4.2.2.1)

⁶⁹ According to Field (2005:736) Levene's test "tests the hypothesis that the variances in different groups are equal (i.e. difference between the variances is zero). A significant result indicates that the variances are significantly different – therefore, the assumption of *homogeneity of variances* has been violated." Homogeneity of variance relates to the assumption that "the variance of one variable is stable (i.e. relatively similar) at all levels of another variable". (Field, 2005:733)

Appendix R: Keyness of select vocabulary items in the IELTS corpus

Key word	Frequency in core corpus ⁷⁰	Percentage in core corpus	Frequency in reference corpus ⁷¹	Percentage in reference corpus	Keyness value*
should	516	1.18	2 551	0.07	1858.23
good	414	0.94	2 277	0.06	1414.78
I	432	0.99	2 900	0.08	1329.51
everyone	157	0.36	353	0.01	770.06
believe	196	0.45	1 075	0.03	669.89
all	367	0.84	6 009	0.17	589.18
you	142	0.32	2 437	0.07	217.20
to	1989	4.54	116 992	3.22	214.08
agree	51	0.12	188	0.005	208.54
every	93	0.21	1 108	0.03	196.11
get	95	0.22	1 517	0.04	155.83
bad	60	0.14	545	0.02	153.50
my	66	0.15	992	0.03	114.49
everybody	21	0.05	61	0.002	94.19
we	158	0.36	6 270	0.17	67.08
during	7	0.02	2 875	0.08	-32.73
with	214	0.49	25 682	0.71	-33.19
individual	49	0.11	10 276	0.28	-58.61
between	12	0.03	5 135	0.14	-60.11
this	267	0.61	35 404	0.97	-69.32
social	18	0.04	6 901	-.19	-74.90
of	887	2.02	122 591	3.38	-282.64
the	1 593	3.63	211 497	5.82	-434.36

*Significant at $p < .001$

Table A-4.3: Keyness of select vocabulary items in the IELTS corpus in reference to the student corpus (§4.2.4.1)

⁷⁰ Core corpus = IELTS corpus

⁷¹ Reference corpus = student corpus

Appendix S: List of target bundles derived from published corpus

N	Word	Freq.	Range	%
1	ON THE BASIS OF	276	108	38.57
2	THE EXTENT TO WHICH (THE)	217	90	32.14
3	ON THE OTHER HAND	212	104	37.14
4	IN THE CONTEXT OF	201	102	36.43
5	AT THE SAME TIME	165	93	33.21
6	ARE MORE LIKELY TO	153	76	27.14
7	IT IS IMPORTANT TO	152	94	33.57
8	AS WELL AS THE	147	91	32.50
9	THE DEGREE TO WHICH	134	58	20.71
10	THE NATURE OF THE	122	67	23.93
11	IN THE CASE OF	117	68	24.29
12	IT IS POSSIBLE THAT	110	72	25.71
13	AS A RESULT OF	106	68	24.29
14	MORE LIKELY TO BE	106	56	20.00
15	IN TERMS OF THE	103	61	21.79
16	WERE MORE LIKELY TO	92	51	18.21
17	AS A FUNCTION OF	90	48	17.14
18	THE END OF THE	84	53	18.93
19	AT THE END OF	83	49	17.50
20	IN THE ABSENCE OF	83	52	18.57
21	TO THE EXTENT THAT	80	51	18.21
22	THAT THERE IS A	79	47	16.79
23	AT THE LEVEL OF	77	41	14.64
24	THE RESULTS OF THE	77	53	18.93
25	IN THE FORM OF	75	55	19.64
26	IS CONSISTENT WITH THE	71	43	15.36
27	IN THE FACE OF	67	44	15.71
28	ARE LIKELY TO BE	66	51	18.21
29	A GREAT DEAL OF	65	45	16.07
30	TO THE DEVELOPMENT OF	64	47	16.79
31	FOR EACH OF THE	62	49	17.50
32	IN ADDITION TO THE	62	52	18.57
33	AT THE TIME OF	60	39	13.93
34	IS LIKELY TO BE	60	41	14.64
35	A WIDE RANGE OF	58	47	16.79
36	OF THE VARIANCE IN	58	39	13.93
37	THE FACT THAT THE	58	45	16.07
38	TO BE ASSOCIATED WITH	56	41	14.64
39	ONE OF THE MOST	55	44	15.71
40	THE BASIS OF THE	55	43	15.36
41	THE SIZE OF THE ⁷²	55	24	8.57
42	THE WAYS IN WHICH	55	33	11.79
43	HAVE BEEN SHOWN TO	54	38	13.57
44	RESEARCH IS NEEDED TO	54	39	13.93
45	WITH RESPECT TO THE	54	36	12.86
46	HAVE BEEN FOUND TO	53	35	12.50
47	IN THE DEVELOPMENT OF	53	34	12.14

⁷² Those highlighted in blue have a range of greater than 5%, but less than 10%.

48	WITH REGARD TO THE	51	27	9.64
49	BEEN SHOWN TO BE	50	33	11.79
50	IT IS LIKELY THAT	50	39	13.93
51	THE RELATIONSHIP BETWEEN THE	50	31	11.07
52	TO BE ABLE TO	50	41	14.64
53	HAS BEEN SHOWN TO	49	33	11.79
54	THE IMPORTANCE OF THE	48	42	15.00
55	IT SHOULD BE NOTED	47	34	12.14
56	OF INDIVIDUAL DIFFERENCES IN	47	22	7.86
57	THE DEVELOPMENT OF A	47	33	11.79
58	BE MORE LIKELY TO	46	23	8.21
59	RESEARCH HAS SHOWN THAT	46	32	11.43
60	CAN BE USED TO	45	37	13.21
61	(IS) IMPORTANT TO NOTE THAT	45	34	12.14
62	IN A NUMBER OF	45	33	11.79
63	IS ONE OF THE	45	38	13.57
64	THE CONTEXT OF THE	45	33	11.79
65	THE WAY IN WHICH	45	30	10.71
66	ON THE PART OF	44	34	12.14
67	THE RESULTS OF THIS	44	30	10.71
68	A FUNCTION OF THE	43	29	10.36
69	A LARGE NUMBER OF	43	31	11.07
70	FOR THE DEVELOPMENT OF	43	35	12.50
71	IT IS DIFFICULT TO	43	35	12.50
72	OF THE RELATIONSHIP BETWEEN	43	28	10.00
73	ON THE ONE HAND	43	35	12.50
74	THE ROLE OF THE	43	34	12.14
75	A WIDE VARIETY OF	42	28	10.00
76	IT IS NECESSARY TO	42	34	12.14
77	IT IS CLEAR THAT	41	28	10.00
78	OVER THE COURSE OF	41	27	9.64
79	APPEARS TO BE A	40	32	11.43
80	IN A STUDY OF	40	29	10.36
81	BEEN FOUND TO BE	39	29	10.36
82	IN A VARIETY OF	39	34	12.14
83	IT IS POSSIBLE TO	39	32	11.43
84	IT MAY BE THAT	39	31	11.07
85	STUDIES HAVE SHOWN THAT	39	26	9.29
86	AS WELL AS IN	38	29	10.36
87	IN A WAY THAT	38	28	10.00
88	IN THE NUMBER OF	38	28	10.00
89	IN THE SAME WAY	38	28	10.00
90	THE TOTAL NUMBER OF	38	21	7.50
91	WERE INCLUDED IN THE	38	28	10.00
92	WITH THE EXCEPTION OF	38	29	10.36
93	AND THE NUMBER OF	37	27	9.64
94	AS PART OF THE	37	32	11.43
95	AT THE UNIVERSITY OF	37	24	8.57
96	CAN BE FOUND IN	37	26	9.29
97	IN THE AREA OF	37	26	9.29
98	SHOULD BE NOTED THAT	37	28	10.00
99	THERE IS EVIDENCE THAT	37	28	10.00

100	AS PART OF A	36	32	11.43
101	IS MORE LIKELY TO	36	24	8.57
102	TO ACCOUNT FOR THE	36	25	8.93
103	TO THE FACT THAT	36	29	10.36
104	WITHIN THE CONTEXT OF	36	27	9.64
105	ARE CONSISTENT WITH THE	35	25	8.93
106	AT THE BEGINNING OF	35	24	8.57
107	THE PURPOSE OF THE	35	27	9.64
108	THE PURPOSE OF THIS	35	30	10.71
109	A NUMBER OF STUDIES	34	25	8.93
110	ARE LESS LIKELY TO	34	28	10.00
111	AT THE EXPENSE OF	34	22	7.86
112	IN TERMS OF THEIR	34	27	9.64
113	IN THE FIELD OF	34	27	9.64
114	DESPITE THE FACT THAT	33	25	8.93
115	IN THE PRESENCE OF	33	25	8.93
116	THE MAJORITY OF THE	33	28	10.00
117	THE POSSIBILITY THAT THE	33	29	10.36
118	THE REST OF THE	33	27	9.64

Appendix T: Structures and functions of the target bundles in the published corpus

Lexical bundle	Structures	Functions
ON THE BASIS OF	prep phrase + of	FRAMING
THE EXTENT TO WHICH (THE)	noun phrase + post-nominal clause	QUANTIFICATION
ON THE OTHER HAND	prep phrase	TRANSITION
IN THE CONTEXT OF	prep phrase + of	FRAMING
AT THE SAME TIME	prep phrase	LOCATION
ARE MORE LIKELY TO	verb phrase + to-clause	STANCE
IT IS IMPORTANT TO	anticipatory <i>it</i> + vb + adj + to-clause	STANCE
AS WELL AS THE	OTHER: adverbial phrase	TRANSITION
THE DEGREE TO WHICH	noun phrase + post-nominal clause	QUANTIFICATION
THE NATURE OF THE	noun phrase + of	DESCRIPTION
IN THE CASE OF	prep phrase + of	FRAMING
IT IS POSSIBLE THAT	anticipatory <i>it</i> + vb + adj + comp	STANCE
AS A RESULT OF	prep phrase + of	RESULTATIVE
MORE LIKELY TO BE	OTHER: adjectival phrase	STANCE
IN TERMS OF THE	prep phrase + of	FRAMING
WERE MORE LIKELY TO	verb phrase + to-clause	STANCE
AS A FUNCTION OF	prep phrase + of	RESULTATIVE
THE END OF THE	noun phrase + of	LOCATION
AT THE END OF	prep phrase + of	LOCATION
IN THE ABSENCE OF	prep phrase + of	FRAMING
TO THE EXTENT THAT	prep phrase + comp	FRAMING
THAT THERE IS A	that-clause fragment	DESCRIPTION
AT THE LEVEL OF	prep phrase + of	FRAMING
THE RESULTS OF THE	noun phrase + of	RESULTATIVE
IN THE FORM OF	prep phrase + of	DESCRIPTION
IS CONSISTENT WITH THE	verb phrase + prep phrase frag	DESCRIPTION
IN THE FACE OF	prep phrase + of	FRAMING
ARE LIKELY TO BE	verb phrase + to-clause	STANCE
A GREAT DEAL OF	noun phrase + of	QUANTIFICATION
TO THE DEVELOPMENT OF	prep phrase + of	DESCRIPTION
FOR EACH OF THE	prep phrase + of	QUANTIFICATION
IN ADDITION TO THE	prep phrase	TRANSITION
AT THE TIME OF	prep phrase + of	LOCATION
IS LIKELY TO BE	verb phrase + to-clause	STANCE
A WIDE RANGE OF	noun phrase + of	QUANTIFICATION
OF THE VARIANCE IN	prep phrase	DESCRIPTION
THE FACT THAT THE	noun phrase + complementizer	STANCE
TO BE ASSOCIATED WITH	verb phrase + prep phrase frag	DESCRIPTION
ONE OF THE MOST	noun phrase + prep phrase	QUANTIFICATION
THE BASIS OF THE	noun phrase + of	FRAMING
THE SIZE OF THE ⁷³	noun phrase + of	DESCRIPTION
THE WAYS IN WHICH	noun phrase + post-nominal clause	PROCEDURE
HAVE BEEN SHOWN TO	verb phrase + to-clause	RESULTATIVE
RESEARCH IS NEEDED TO	noun phrase + verb phrase	STANCE
WITH RESPECT TO THE	prep phrase	FRAMING
HAVE BEEN FOUND TO	verb phrase + to-clause	RESULTATIVE
IN THE DEVELOPMENT OF	prep phrase + of	DESCRIPTION

⁷³ Those highlighted in blue have a range of greater than 5%, but less than 10%.

WITH REGARD TO THE	prep phrase	FRAMING
BEEN SHOWN TO BE	verb phrase + to-clause	RESULTATIVE
IT IS LIKELY THAT	anticipatory <i>it</i> + vb + adj + comp	STANCE
THE RELATIONSHIP BETWEEN		
THE	noun phrase + prep phrase	DESCRIPTION
TO BE ABLE TO	verb phrase + to-clause	DESCRIPTION
HAS BEEN SHOWN TO	verb phrase + to-clause	RESULTATIVE
THE IMPORTANCE OF THE	noun phrase + of	STANCE
IT SHOULD BE NOTED	anticipatory <i>it</i> + VP	ENGAGEMENT
OF INDIVIDUAL DIFFERENCES		
IN	prep phrase	DESCRIPTION
THE DEVELOPMENT OF A	noun phrase + of	DESCRIPTION
BE MORE LIKELY TO	verb phrase + to-clause	STANCE
RESEARCH HAS SHOWN THAT	noun phrase + verb phrase	RESULTATIVE
CAN BE USED TO	verb phrase + to-clause	PROCEDURE
(IS) IMPORTANT TO NOTE THAT	OTHER: adjectival phrase	ENGAGEMENT
IN A NUMBER OF	prep phrase + of	QUANTIFICATION
IS ONE OF THE	verb + noun phrase	QUANTIFICATION
THE CONTEXT OF THE	noun phrase + of	FRAMING
THE WAY IN WHICH	noun phrase + post-nominal clause	PROCEDURE
ON THE PART OF	prep phrase + of	FRAMING
THE RESULTS OF THIS	noun phrase + of	RESULTATIVE
A FUNCTION OF THE	noun phrase + of	PROCEDURE
A LARGE NUMBER OF	noun phrase + of	QUANTIFICATION
FOR THE DEVELOPMENT OF	prep phrase + of	DESCRIPTION
IT IS DIFFICULT TO	anticipatory <i>it</i> + vb + adj + to-clause	STANCE
OF THE RELATIONSHIP		
BETWEEN	prep phrase	DESCRIPTION
ON THE ONE HAND	prep phrase	TRANSITION
THE ROLE OF THE	noun phrase + of	PROCEDURE
A WIDE VARIETY OF	noun phrase + of	QUANTIFICATION
IT IS NECESSARY TO	anticipatory <i>it</i> + vb + adj + to-clause	STANCE
IT IS CLEAR THAT	anticipatory <i>it</i> + vb + adj + comp	STANCE
OVER THE COURSE OF	prep phrase + of	LOCATION
APPEARS TO BE A	verb phrase + to-clause	STANCE
IN A STUDY OF	prep phrase + of	DESCRIPTION
BEEN FOUND TO BE	verb phrase + to-clause	RESULTATIVE
IN A VARIETY OF	prep phrase + of	DESCRIPTION
IT IS POSSIBLE TO	anticipatory <i>it</i> + vb + adj + to-clause	STANCE
IT MAY BE THAT	anticipatory <i>it</i> + VP	STANCE
STUDIES HAVE SHOWN THAT	noun phrase + verb phrase	RESULTATIVE
AS WELL AS IN	OTHER: adverbial phrase	TRANSITION
IN A WAY THAT	prep phrase + comp	PROCEDURE
IN THE NUMBER OF	prep phrase + of	QUANTIFICATION
IN THE SAME WAY	prep phrase	PROCEDURE
THE TOTAL NUMBER OF	noun phrase + of	QUANTIFICATION
WERE INCLUDED IN THE	verb phrase + prep phrase frag	DESCRIPTION
WITH THE EXCEPTION OF	prep phrase + of	FRAMING
AND THE NUMBER OF	OTHER: conj + NP	QUANTIFICATION
AS PART OF THE	prep phrase + of	DESCRIPTION
AT THE UNIVERSITY OF	prep phrase + of	LOCATION
CAN BE FOUND IN	verb phrase + prep phrase frag	DESCRIPTION
IN THE AREA OF	prep phrase + of	LOCATION

SHOULD BE NOTED THAT	OTHER: modal + VP	ENGAGEMENT
THERE IS EVIDENCE THAT	OTHER: dummy subject + VP	RESULTATIVE
AS PART OF A	prep phrase + of	LOCATION
IS MORE LIKELY TO	verb phrase + to-clause	STANCE
TO ACCOUNT FOR THE	verb phrase + prep phrase frag	RESULTATIVE
TO THE FACT THAT	prep phrase + comp	FRAMING
WITHIN THE CONTEXT OF	prep phrase + of	FRAMING
ARE CONSISTENT WITH THE	verb phrase + prep phrase frag	DESCRIPTION
AT THE BEGINNING OF	prep phrase + of	LOCATION
THE PURPOSE OF THE	noun phrase + of	PROCEDURE
THE PURPOSE OF THIS	noun phrase + of	PROCEDURE
A NUMBER OF STUDIES	noun phrase + of	QUANTIFICATION
ARE LESS LIKELY TO	verb phrase + to-clause	STANCE
AT THE EXPENSE OF	prep phrase + of	FRAMING
IN TERMS OF THEIR	prep phrase + of	FRAMING
IN THE FIELD OF	prep phrase + of	LOCATION
DESPITE THE FACT THAT	prep phrase + comp	FRAMING
IN THE PRESENCE OF	prep phrase + of	FRAMING
THE MAJORITY OF THE	noun phrase + of	QUANTIFICATION
THE POSSIBILITY THAT THE	noun phrase + complementizer	STANCE
THE REST OF THE	noun phrase + of	QUANTIFICATION

Appendix U: Structures and functions of the most frequent bundles in the student corpus

Word	Structures	Functions
AS A RESULT OF	prep phrase + of	RESULTATIVE
AS WELL AS THE	OTHER: adverbial phrase	TRANSITION
THE WAY IN WHICH	noun phrase + prep phrase	PROCEDURE
ON THE OTHER HAND	prep phrase	TRANSITION
TO THE FACT THAT	prep phrase + comp	FRAMING
IT IS IMPORTANT TO	anticipatory <i>it</i> + vb + adj + to-clause	STANCE
AT THE SAME TIME	prep phrase	LOCATION
TO BE ABLE TO	verb phrase + to-clause	DESCRIPTION
ARE MORE LIKELY TO	verb phrase + to-clause	STANCE
DUE TO THE FACT	OTHER: adjectival phrase	RESULTATIVE
THE END OF THE	noun phrase + of	LOCATION
IN THE DEVELOPMENT OF	prep phrase + of	FRAMING
CAN BE DEFINED AS	verb phrase + prep phrase frag	DESCRIPTION
IN THE CASE OF	prep phrase + of	FRAMING
IN THE FORM OF	prep phrase + of	DESCRIPTION
THAT THERE IS A	that-clause fragment	DESCRIPTION
IS ONE OF THE	verb + noun phrase	QUANTIFICATION
TO THE DEVELOPMENT OF	prep phrase + of	RESULTATIVE
IN TERMS OF THE	prep phrase + of	FRAMING
CAN BE SEEN AS ⁷⁴	verb phrase + prep phrase frag	DESCRIPTION
WHEN IT COMES TO	WH-clause fragment	FRAMING
DEVELOP A SENSE OF	verb + noun phrase	DESCRIPTION
THE DEVELOPMENT OF THE	noun phrase + of	DESCRIPTION
IT IS EVIDENT THAT	anticipatory <i>it</i> + vb + adj + comp	STANCE
BETWEEN THE AGES OF	prep phrase + of	DESCRIPTION
A RESULT OF THE	noun phrase + of	RESULTATIVE
WILL BE ABLE TO	verb phrase + to-clause	DESCRIPTION
ONE OF THE MOST	noun phrase + other post modification	QUANTIFICATION
THE BACK OF THE	noun phrase + of	LOCATION
NOT BE ABLE TO	verb phrase + to-clause	DESCRIPTION
AT THE AGE OF	prep phrase + of	DESCRIPTION
THEY ARE ABLE TO	noun phrase + verb phrase	DESCRIPTION
AN EXAMPLE OF THIS	noun phrase + of	DESCRIPTION
THE WAYS IN WHICH	noun phrase + prep phrase	DESCRIPTION
IT IS CLEAR THAT	anticipatory <i>it</i> + vb + adj + comp	STANCE
IN RELATION TO THE	prep phrase	FRAMING
THE FACT THAT THE	noun phrase + other post modification	STANCE
THE BEGINNING OF THE	noun phrase + of	LOCATION
IS BASED ON THE	verb phrase + prep phrase frag	FRAMING
AT THE BACK OF	prep phrase + of	LOCATION
IS DEFINED AS THE	verb phrase + prep phrase frag	DESCRIPTION
BE DEFINED AS THE	verb phrase + prep phrase frag	DESCRIPTION
THE MANNER IN WHICH	noun phrase + prep phrase	PROCEDURE
IT WAS FOUND THAT	anticipatory <i>it</i> + vb + adj + comp	RESULTATIVE
(IS) IMPORTANT TO NOTE THAT	verb phrase + to-clause	ENGAGEMENT

⁷⁴ Those highlighted in green have a range of greater than 5%, but less than 10%.

AT THE END OF	prep phrase + of	LOCATION
CAN BE SEEN IN	verb phrase + prep phrase frag	ENGAGEMENT
IS DUE TO THE	verb phrase + prep phrase frag	RESULTATIVE
AND AS A RESULT	OTHER: conj. + PP	RESULTATIVE
CAN BE USED TO	verb phrase + to-clause	PROCEDURE
IS REFERRED TO AS	verb phrase + prep phrase frag	DESCRIPTION
THROUGH THE USE OF	prep phrase + of	PROCEDURE
AS WELL AS A	OTHER: adverbial phrase	TRANSITION
IN THE SENSE THAT	prep phrase + comp	FRAMING
IS SAID TO BE	verb phrase + to-clause	DESCRIPTION
IS MADE UP OF	verb phrase + prep phrase frag	DESCRIPTION
WITH REGARDS TO THE	prep phrase	FRAMING
IN ORDER TO BE	prep phrase + to-clause (frag)	RESULTATIVE
AS A FORM OF	prep phrase + of	DESCRIPTION
PLAY A ROLE IN	verb + noun phrase	PROCEDURE
BE SEEN AS A	verb phrase + prep phrase frag	DESCRIPTION
IS KNOWN AS THE	verb phrase + prep phrase frag	DESCRIPTION
MORE LIKELY TO BE	OTHER: adjectival phrase	STANCE
THIS IS DUE TO	noun phrase + verb phrase	RESULTATIVE
THE PURPOSE OF THIS	noun phrase + of	PROCEDURE
AN IMPORTANT ROLE IN	noun phrase + prep phrase	STANCE
THE EXTENT TO WHICH	noun phrase + prep phrase	QUANTIFICATION
THIS CAN BE SEEN	noun phrase + verb phrase	ENGAGEMENT
THIS ESSAY WILL DISCUSS	noun phrase + verb phrase	STRUCTURING
IN ORDER TO UNDERSTAND	prep phrase + to-clause (frag)	PROCEDURE
STUDIES HAVE SHOWN		
THAT	noun phrase + verb phrase	RESULTATIVE
TO MAKE SENSE OF	verb + noun phrase	PROCEDURE
FOR THE PURPOSE OF	prep phrase + of	PROCEDURE
IN THE CONTEXT OF	prep phrase + of	FRAMING
IN A WAY THAT	prep phrase + comp	DESCRIPTION
IN ACCORDANCE WITH THE	prep phrase	FRAMING
THE DEVELOPMENT OF A	noun phrase + of	DESCRIPTION