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MATURE STUDENTS
IN
OCCUPATIONAL THERAPY EDUCATION AND PRACTICE

Thesis submitted for Module PR4 –Doctorate in Education

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ABSTRACT

This research study investigated age as a predictor of success in the academic outcome and early professional performance of recent occupational therapy graduates. The study was divided into two parts. The analysis of age and academic performance in occupational therapy education initially provided a picture of mature student success when compared with the performance of younger students, but this finding was negated when the confounding variable of entry qualification was added to the analysis. The mature student data were strongly influenced by the superior academic performance of the students who had a previous degree on entry to occupational therapy education. When these degree-level entrants were removed from the age analysis, the academic performance of the remaining mature students did not differ significantly from that of the younger students. This result indicates that entry qualifications, in particular a previous degree, have a positive predictive affect on academic performance in occupational therapy education.

The second part of the study investigated the impact of age on the early professional performance of recent occupational therapy graduates using a competency questionnaire adapted from the curriculum framework document for occupational therapy in the UK (COT, 1998). The hypotheses that age is a value-added factor in the early professional performance and level of threshold competence after graduation was partially upheld in the graduate self-ratings of competence but not in the employer ratings of new graduates in practice. No age differences were observed in the employer ratings of graduate abilities but academic performance at university was related to perceived levels of competence. When graduates rated their self-perceived levels of competence, it was the mature graduates who consistently rated themselves as being more competent than their younger peers. The type of occupational therapy programme undertaken did not relate to either the employer or graduate ratings of competence. All respondents were provided with an opportunity to comment on the issue of professional competence. Mature students expressed high expectations of their professional competence yet were no different to all other new graduates in reporting stress when making the transition between being a student and qualified practitioner. A discrepancy in expectations of threshold competence was observed between the employer and the graduate comments.

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CHAPTER 1 INTRODUCTION

This doctoral thesis provides an in-depth exploration of age and its impact on the academic outcome and early professional performance of graduates from occupational therapy programmes in England and Wales. The study compares the performance of two age groups of university students at the point of exit from occupational therapy programmes and during the first year of professional practice as occupational therapists. In the United Kingdom (UK) the traditional age of students on entry to university ranges from 18 to 21 years of age. A student who enters university over the age of 21 is classified as a mature student. This subset of the student body now represents 26% of all undergraduate university entrants (Higher Education Funding Council for Education, 1999-2000). For clarification throughout this thesis, the group of students aged 18 to 21 will be referred to as the 'young students' and the older group aged more than 21 years - the 'mature students'.

RATIONALE FOR THE STUDY

The academic success of mature students in higher education has been consistently documented in the general education literature since the 1970s but there is a notable lack of published literature investigating the impact of age on the academic performance of students in healthcare education (Hartley, Trueman & Lapping, 1993; Hoskins, Newstead & Dennis, 1997; Lucas & Ward, 1985; Richardson, 1995; Simonite, 1997; Smithers & Griffin, 1986; Walker, 1975). This study will explore how mature students perform academically on occupational therapy programmes across England and Wales. Statistical data from the College of Occupational Therapists (COT) in London indicates that 51% of all applications to occupational therapy programmes are from mature students (COT, 2001a). If the results of this study show that mature students have a level of academic performance equivalent to or above the 18-year-old university entrant, then this evidence could be used to support a shift in emphasis of the national recruitment strategy to attract more mature applicants to occupational therapy. Educational outcomes at the point of exit from a programme are one way of determining the impact of age differences, but this study will also investigate the effect of age as graduates move from university to the world of professional work as occupational therapists. British government policy encourages life-long learning and strong links

between education, business, employers and trade unions (Department for Education and Employment, 1998). Many of these strategic initiatives arose out of the report of the National Committee of Inquiry into Higher Education (NCIHE) chaired by Sir Ronald Dearing (NCIHE, 1997). As relative newcomers to the university setting, those involved in the education of healthcare professionals in the UK are particularly keen to maintain strong links between universities and the world of work. Up until the late 1980s, much of the nation's healthcare education took place in hospital settings or mono-disciplinary colleges that awarded a diploma-level qualification (Blom-Cooper, 1989). The Blom-Cooper Commission of Inquiry into Occupational Therapy deduced that occupational therapy education at these colleges was of a bachelor's standard and urged the profession to foster links with local universities and polytechnics to attain degree recognition and status for occupational therapy students. By 1990, this goal had been universally achieved and occupational therapy programmes across the British Isles were fully integrated into university settings. However, the new degree status awarded to qualifying occupational therapists brought with it concern that the practical training approach to skills development would be compromised in the effort to achieve higher levels of knowledge and research skills in a degree curriculum. This resulted in a proliferation of articles in the professional literature expressing concern about fitness for practice (Baird & Ellis, 1982; Gape & Hewin, 1995; Wilson, 1982).

The issue of a degree qualification is now a well received and accepted move on the part of the profession but concerns still abide over competence and transitions into practice for occupational therapy graduates (Kenyon & Ilott, 1997; Parker, 1991). The NCIHE recommended a strategy of widening participation, to recruit students who would not otherwise have the opportunity to enter higher education (NCIHE, 1997). In adhering to this agenda, universities must continue to recruit more mature students, of whom some will enter higher education with significant life experience and familiarity with the world of work. Therefore one might deduce that the move into professional employment would be a seamless transition for the mature graduate.

The study will investigate whether employers perceive any differences in levels of professional competency between mature and young students during their first year of employment as occupational therapists. The results will then be compared with how graduates view their own levels of competency. The data collected will show whether age is a value-added factor in early professional performance of new graduates in

practice. The associated issues of academic performance at university and differing occupational therapy curricula will be explored in the results and in the supporting literature for the study.

AIMS OF THE STUDY

The study will investigate whether age is a predictor of success in the academic outcome and early professional performance of recent occupational therapy. The following research questions are derived from this overarching aim:

1. Do mature students in occupational therapy programmes across England and Wales perform better academically than younger students at the point of exit from the programme?
2. Do employers perceive a difference between mature graduates and young graduates, as measured by an occupational therapy graduate competency rating scale?
3. Does the age of the graduate have an impact on their perceived level of professional competence, as measured by the graduate competency rating scale?

PRESENTATION OF THE STUDY

The study is presented using the recognised format of thesis publication outlined in the British Standards (BS 4821, 1990). The referencing style adopted uses in-text citations that refer the reader to the alphabetical list at the end of the published document. The referencing style used is the American Psychological Association (APA) style, which concurs closely with the Harvard referencing system. References, according to the APA style are listed at the back of the text in alphabetical order. In-text citations are written in full on the first occasion and then abbreviated to 'et al' if there are more than two authors in the citation. The APA style was chosen because this style is commonly used in the occupational therapy literature and its use in the thesis will expedite dissemination of the body of work after successful completion of the degree. The thesis plan presented in this introductory chapter serves to open the text by outlining the aims and rationale for the study. It is followed by a literature review in Chapter 2.

This second chapter is divided into three discrete sections, each addressing a separate theme relevant to the research questions. The first section explores the general body of

literature relating to the academic performance of mature students in university education. The second section explores how and why competence has become the central thrust of healthcare education in the 21st century. The final section of the literature review serves to integrate the main themes of the review; age and its impact on academic performance and professional competence. The chapter concludes by summarising the key issues emerging from the literature review and highlights the gaps in the research evidence that underpin the need for the current study.

Chapter 3 presents the research method selected to collect data in this study. This choice of methodological paradigm is then defended against alternative methods of research.

Chapter 4 analyses, examines and interprets the data collected by the study. It begins by presenting the data collected from occupational therapy programmes at universities across England and Wales (Part 1), with the remainder of the chapter devoted to the analysis of the data collected through the competency questionnaires mailed to recent graduates and occupational therapy employers (Part 2). All the statistical output from the data analyses summarised in this chapter are presented in full in Appendix 5. The chapter concludes with a summary of the important findings of the research.

The discussion of these findings is presented in Chapter 5. The emergent results are evaluated in the context of the existing body of literature and the research evidence presented in Chapter 2. The discussion chapter concludes by critiquing the strengths and weaknesses of the research method used in the study.

The final chapter, titled 'Conclusions and Recommendations', closes the body of work by summarising the main findings of the study, and it identifies a number of key recommendations for future policy development and research in healthcare education

CHAPTER 2 LITERATURE REVIEW

INTRODUCTION

This review of the literature will focus on age and its impact on the academic attainment and early professional performance of new graduates in healthcare practice from the perspective of both the graduate and the employer. The literature review was informed by a combination of searching approaches. Electronic or web based databases such as Medline, Amed, CINHALL, Eric and International Eric were used along with hand searching strategies in local medical and university libraries. The search terms used in the overall search strategy were directly related to the theme of the study and so included terms such as 'mature students', 'academic performance' and 'professional competence'. However, the search terms were modified on a case-by-case basis to accommodate the different words used in the thesaurus of the various electronic databases. Boolean operators were also used to combine search terms. See Table 1 on the following page.

In selecting the literature for this study the following inclusion and exclusion criteria were used.

The inclusion criteria were studies and literature that related directly to the concept of student age and its influence on performance in either the academic or clinical setting. Many of the studies in the Medline search were specific to certain areas of medical education and so were excluded. Other excluded literature were studies that addressed mature students in the context of widening access initiatives, part time study courses or strategies that promoted more effective learning in the mature student body. Many articles were found under the heading professional competence however, many were related to specific aspects of clinical competence or not specific to entry-level practitioners. The year of publication was used as a discretionary exclusion criterion in then general education literature where older literature was used to support a historical argument. For the health related literature, no specified time limit for the date of publication was rigidly set but preference was given to literature published in the past 20 years, as this time frame reflects the introduction of degree status in the education of healthcare professionals.

TABLE 1. RESULTS OF ELECTRONIC DATABASE SEARCHING

Data base name and date context	Search terms	Number of hits
<p>AMED Years 1985-2000/01</p>	<p>Degree and professional education Professional competence Professional competence & education or students Students and professional competence Mature students Mature students & occupational therapy Occupational therapy & professional education New graduates</p> <p><i>Cited references</i></p>	<p>14 682 128 77 5 2 113 10</p> <p>25</p>
<p>ERIC International Eric 1984/2001 Australian Education Index 1985/2001</p>	<p>Mature students or adult students Cited references</p> <p>Mature students or adult students <i>Cited references</i></p>	<p>329 14</p> <p>101 3</p>
<p>British Nursing Index 1985-1996 1997-2000</p>	<p>Competence Professional competence and education Education and competence</p> <p><i>Cited references</i></p>	<p>319 4 90</p> <p>9</p>
<p>Medline 1980-2000</p>	<p>Mature students and medical education Medical education and student performance</p> <p><i>Cited references</i></p>	<p>3 80</p> <p>6</p>
<p>CINAHL 1982-1998 1999-2000 2000-2001</p>	<p>Student age and competence Mature students Mature students and competence</p> <p><i>Cited references</i></p>	<p>4 46 2</p> <p>3</p>

This chapter is divided into three sections, each addressing a separate theme relevant to the research questions. The first section of the literature review begins by briefly discussing definitions of maturity and explores why older students choose to enter or,

for some, re-enter higher education in later life. It then explores the general body of literature relating to the academic performance of mature students in higher education. This wide literature base provides a reference point from which to explore the narrower body of literature relating to the performance of mature students on professional healthcare education programmes. The subjective experiences of mature students in the university setting are also examined because these are seen to impact on levels of performance in higher education.

The second section of this literature review explores how and why competence in the workplace after graduation from university has become a central thrust of higher education in the 21st century. This is an issue of particular concern to those involved in educating healthcare professionals and thus health-related literature forms the main basis of this section of the literature review. Researchers working in this area agree that professional competence is a difficult concept to define and measure, so particular attention will be given in this chapter to a discussion of competence and how different authors have approached its measurement in health care (Hager, Gonczi & Athanasou, 1994; Ilott & Murphy, 1999). This section also includes literature relating to how frameworks of professional competence are designed and tested for validity, an important concept when discussing the measurement of competence.

The third and final section of the literature review integrates the main theme of the literature review – age and its impact on academic performance and professional competence. The association between the academic curriculum and the current and future needs of healthcare practice is explored here. The section looks at the relationship between academic performance in university and performance on the clinical or fieldwork component of healthcare education. This relationship between academic performance and clinical performance is discussed further by looking at factors that impact on the levels of competence. Issues relating to the transition from student to healthcare professional, and the employers' perceptions of the professional competence of recent graduates, are also reviewed in this final section. The chapter concludes by summarising the key issues emerging from the review and highlights the gaps in the research evidence that are being addressed by this original piece of research.

AGE CLASSIFICATIONS AND CONCEPTS OF MATURITY

In the UK a mature student is defined by the Higher Education Statistics Agency (HESA, 1995) as a person who is aged 21 or older on admission to university. It must be recognised, however, that life experience has an impact on maturity irrespective of chronological age, so classifications made purely on the basis of age may be erroneous (Yates, 1994). Yates explored definitions of maturity in the context of teaching in higher education and made extensive reference to Heath's taxonomy of maturity, which was developed in the 1960s, as well as Knowles's 15 polar dimensions of maturity. In combining these two approaches, Yates concluded that 'maturity is a complex and multivariate phenomenon which is dynamic and highly significant in a learning situation' (Yates, 1994, p. 117). This perspective recognises maturity as a trait that can be gained through experiential development and not just as a classification based on biological development. Although few would argue with the literature outlined above, British universities continue to use the biological classification to denote those entering university aged 21 or above as mature students. This well-recognised binary division of the student body into mature and young students is used to explore age and its impact on academic attainment in higher education and early professional performance in the current study. Due recognition will be given to other factors that influence performance such as motivation, personal development, and life and work experience.

AN EXPLORATION OF AGE-RELATED SUCCESS IN HIGHER EDUCATION

Researchers have been investigating the performance of mature students in higher education for a considerable number of years. Some earlier work showed that mature students did not perform as well as 18-year-old university entrants (Barnett & Lewis, 1963; Kapur, 1972). But over the past 25 years the research has consistently shown that mature students performed as well or better than their younger peers in higher education (Hartley et al, 1993; Hoskins et al, 1997; Lucas & Ward, 1985; Richardson, 1995; Simonite, 1997; Smithers & Griffin, 1986; Walker, 1975). This may be as a result of the increased numbers of mature students recruited into higher education by the recent 'Widening Access' initiatives (NCIHE, 1997). More representation of mature students

in age group comparisons also increases the power of any statistical analyses of numerical scores.

Motivation

The academic success of mature students in higher education has been explained by a strong motivation to succeed (Hoskins et al., 1997; Richardson, 1995; Walker, 1975). The conspicuous success of mature female students at higher education institutions in Australia prompted Scott, Burns and Cooney (1998) to explore this phenomenon using the 64 item 'Continuing Education Women Questionnaire' on a sample of 150 female graduates. The factor analysis carried out in this study gave rise to five key drivers that motivated woman to enter higher education. They were listed as an altruistic drive for self-development, compensatory activity to overcome and divert thinking away from personal difficulties or even boredom, vocational or family advancement in order to secure higher-paying jobs, a questioning of life roles and an opportunity to discover a new inner potential. From a purely statistical point of view, the ratio of items in the questionnaire to the number of respondents in this study does raise some concern about the use of factor analysis. The authors acknowledge this issue but weakly defend their use of factor analysis by stating that the findings replicate those of US studies that used the same tool.

West (1995) also maintained that student success in higher education can be fully understood only after exploring why mature students enter higher education. West's qualitative research provided an insider perspective on why adults return to higher education and illustrated the dramatic effect that attending higher education had on the lives of students. Using life history methodology, the author explored why adults entered higher education at a particular stage in their lives. A key premise of the research was that a true understanding of motivation is limited by the way such data are collected. If adults are asked to make a choice between vocational and personal reasons, as may occur in large surveys using forced-choice questionnaires, then the vocational aspirations are the more commonly stated reasons for studying as a mature student. Qualitative research methodologies can, however, encourage participants to reflect, and, by using a less structured approach, can discover more private reasons as to why adults choose to do a degree in later life. For some respondents in West's study, higher education was seen as an opportunity to do something uniquely for themselves after a 'career' caring for small children or to redress a life imbalance. These findings are

echoed in the work of Dawson and Boulton (2000), who also used a qualitative study to explore why adults returned to higher education. Interestingly, Pascall and Cox (1993) found that mothers entered higher education as a chance to rewrite their life story, but they did express a sense of unease about putting their own lives first after taking care of others for such a long time.

The healthcare literature provides similar reasons as to why women are motivated to return to university to gain a professional healthcare qualification later on in life. Young (1990) found that mature women entered physiotherapy as a means to discover new roles as a result of difficult life circumstances, such as marriage breakdown or dissatisfaction with former employment. However, Craik and Alderman (1998), in a study that explored why mature female students in the UK wanted to become occupational therapists in later life, found that job satisfaction was the prime motivator, followed by a desire to help others and attain the job security offered by these types of professions. The desire to help others was found to be a key reason for students of all ages in North America to enter occupational therapy education (Cooperstein & Schwartz, 1992; Madigan, 1985). These Canadian and US findings may reflect the lower age range of students studying occupational therapy in North America than students at universities in the UK, this is discussed in more depth throughout the thesis.

Motivation to succeed may not always lead to successful qualification from university, as life circumstances can lead to high levels of attrition in this older age group of students (Higher Education Standards Agency, 1995). Therefore the subjective experience of mature students in the university setting needs to be examined as this may impact on academic performance and completion (Scott et al., 1998; Wong & Kwok, 1997).

Mature students' experiences of higher education

University life inflicts tremendous pressure on the mature student to succeed (MacDonald & Stratta, 1998). These students often have heavy demands on their time, with many roles to juggle in their lives: partner, mother, homemaker, friend, daughter and student (Arksy, Marchant & Simmill, 1994; Smith, 1993). Qualitative research methods can provide a rich insight into the lived experience of being a mature student in higher education. Shanahan (2000) used a phenomenological approach to gain an understanding of the lives of four mature female students on healthcare programmes at

two British universities. The study found that mature students saw education as a catalyst for change in their lives and felt a tremendous pressure to succeed. With the multiple roles they have to juggle there was not enough time in the day to complete all the tasks to the high standard they expected of themselves. These compromises left the women experiencing feelings of guilt that was frequently expressed as anxiety about meeting the academic demands of the programme. The literature clearly shows that mature students succeed academically, but many expressed doubt about their ability, even when provided with formative and summative feedback of their own successful progress (Burns, Scott & Cooney, 1993; Challis, 1976; Daines, Daines & Graham, 1993; Edwards, 1990; Pascall & Cox, 1993).

MEASURING ACADEMIC PERFORMANCE

Formative assessment or testing of student ability in the university sector can be traced back to the Middle Ages, when oral examinations were a popular form of assessment. It was not until the 1940s that the class-ranking model emerges in the historical literature, where Louvain University ranked students into one of four academic categories: *rigorosi* (honours), *transibiles* (satisfactory), *gratiosi* (charity passes), and failures (Popham, 2000). In the UK today the honours bachelor's degree is classified using a four-point scale: a first-class degree (1st = 70 to 100%), upper-second-class degree (2:i = 60 to 69%), lower-second-class degree (2:ii = 50 to 59%), third-class degree (3rd = 40 to 49%) and an ordinary or pass degree. Degree classifications are usually awarded using the numerical academic average aggregated from formative assessment results. A non-honours or ordinary degree is unclassified and is of a lower standard than an honours degree (Popham, 2000). Although this classification system for undergraduate degrees is widely used across the UK, Woolfe and Turner (1997) found that there are marked differences in how individual universities calculate student marks to determine the final classification. Their study found that 15% of students would receive a different degree classification if they were subjected to another university's aggregation system. This raises debate as to how a degree from one university can be compared to a degree awarded from another. A study that investigated academic standards across four institutions, for three discrete subject areas, found that student performance scores on an introductory quantitative research methods module showed marked differences in the distribution of grades across the universities (Yorke & Bourdillon, 1998). The study explored reasons why these differences might have arisen and found that assessment

methods and student profiles varied greatly across institutions. Other researchers have found differences in the profile of degree classifications between subjects within individual universities and between British universities (Chapman, 1994; Higher Education Quality Council, 1997; Jackson & Lund, 2000). These studies concluded that confounding variables such as student entry profiles, the subject area, and different assessment and marking traditions can all impact on the degree classification. Johnes and Taylor (1990) also cautioned researchers to be aware that extraneous factors can effect degree results and degree classifications. They found, for example, that degree results could be statistically predicted on the basis of A-level entry scores, but that student performance can also be influenced by other variables such as library expenditure and the experience of living away from home. The variable of student age has also been found to impact on academic performance in higher education.

The influence of age on academic performance

The performance of mature students in higher education was reviewed by Hartley et al. (1993). They evaluated the academic performance of mature and young students at various British universities from 1975 to 1993 and found that mature students did as well as or even better than younger students. Most studies cited in their analysis used the customary binary divide of under and over 21 years of age to define the student cohorts in their age-related research. The authors suggest a separation out of the mature student category into discrete age-bands to thereby discover previously unidentified differences in the academic performance within the mature student group itself. This approach to classifying age can provide a more sensitive measure in evaluating the relationship between age and performance in higher education and has been used by a number of researchers in more recent studies of age-related issues in higher education (Baxter & Hatt, 1999; Hoskins et al., 1997; Simonite, 1997).

In a study at Oxford Brookes University, Simonite (1997) examined the data for the cohort year of 1994, which included 1222 students. The sample was divided into five age bands encompassing one young age band for those entering the university under the age of 21, and four mature student age bands: 21–24, 25–29, 30–39 and the over 40s. While controlling for gender, entry qualification and subject studied, the results showed some interesting differences between the age groups. Students aged between 30 and 39 had the best performance in the first year of the degree, followed by those students aged over 40. The lowest performing group was the younger, under 21-year-old students.

Baxter and Hatt (1999) used age bands in their investigation of age and successful academic progress from the first year to the second year of a social science degree at the University of the West of England. The cohort was divided into three discrete age bands: under 21, 21–24 and those aged over 25. The cohort included 487 students, of whom only 18% were mature students. But this small proportion did not influence the power of the analysis because only descriptive statistics are presented in this study. Baxter and Hatt found that mature students over the age of 25 were the most likely to progress without difficulty from first year to second year of the degree. The group with the most academic difficulties were those aged between 21 and 25, who they named as the younger mature student group. The over 25-year-olds performed as well as younger students. Their study went on to explore the reasons for this age-related trend in academic performance. They found that 60% of the older mature students had recently participated in academic study, compared with an average three-year gap in academic endeavour among the younger mature student group. They concluded that this break from the routine of study could contribute to the lower academic performance in the 21–25-year-old group. The over 25-year-olds were more likely to have recently completed an Access course and were in the habit of making adjustments to their lives to meet the demands of academic work.

A larger study carried out at the University of Plymouth from the years 1991 to 1995 investigated the academic performance of 3653 students (Hoskins et al., 1997). Student age, entry qualifications, subject and gender were all compared with the final degree classification results. The study found that students aged from 21 to 25 had better degree results than the younger students, and the over 25-year-olds had the best degree results of all.

The studies cited above all differed in their conclusions about age-related performance. Therefore, it would seem that dividing the mature student group into discrete age bands has confused the issue more than clarifying it. There is consensus about the academic superiority, or at least equivalency, of mature students over younger students, but other factors have also emerged from these studies. Entry qualifications were seen to play an important role in age-related performance at university, an issue that is addressed later in this chapter. The studies also highlighted some interesting gender differences, with mature women outperforming men, except in Baxter and Hatt's study, where the

females in the young mature student group (aged 21 to 24) had the worst progression rates of all. The academic performance of women is of particular interest in this healthcare-focused study, because most occupational therapists are women (COT, 2001a).

The academic performance of women

In an Australian study, Burns et al. (1993) collected data on the academic performance of 185 single and married mothers at two metropolitan universities. Interestingly, the study also collected qualitative data on the student experience, which adds a certain depth to the study. The academic results of these women, in particular the married students, shows that they performed better academically than other students, including mature students in general. The qualitative nature of this study does mean, however, that the small sample size limits the external validity of the findings. Lucas and Ward (1985) compared the performance of 263 mature students and 3498 young students at Lancaster University and found that mature female students obtained higher degree classifications than a comparable group of mature male students. But the authors admit that other factors, such as entry qualifications, could affect academic performance. Hoskins et al. (1997), also cited above, found that females outperformed males, irrespective of age, but they also found that entry qualifications had a significant influence on academic performance. Their study found that mature students with non-traditional entry qualifications performed well in comparison with a lower standard of performance among the younger students who entered with non-traditional entry qualifications. This important finding warrants further exploration of the impact of entry qualifications on academic performance in higher education.

Entry qualifications and academic performance

Mature students differ from younger students not only on the basis of age, but entry qualifications can also vary considerably across the two age groups. More and more undergraduates are entering university with qualifications other than A-level awards (HESA, 1995). In the mature student group, entry to university can be achieved through successfully passing an Access course. The development of the Access course in the 1970s provided an opportunity for mature students to gain the necessary university entry qualifications at a college of further education rather than returning to a school or sixth-form college to attain A-level qualifications. Access courses are the most popular route into higher education for the older mature student because they provide A-level

equivalency as well as taught sessions on study skills, information technology and numeracy (Secretary of State for Education and Employment, 1998).

The choice for the under 21-year-old is also wider since the introduction of the General National Vocational Qualification (GNVQ) in 1995, which is now replaced by vocational A-levels. These vocational alternatives to the standard A-level qualification are assessed by coursework, written assessments and the production of a portfolio of evidence. However, Hyland and Weller (1996) identified a number of problems and issues associated with the implementation of the GNVQ awards, which prompted Swalies, Entwistle and Campkin (1998) to compare the university performance of 125 GNVQ entrants to those who entered with A-level qualifications. This study was located at the former Nene University College and explored the grades achieved and attrition rates from business and law degrees. No significant differences for these parameters were found between the GNVQ and A-level groups, but the small numbers in some of the comparison group data for each course meant that the study was lacking in statistical power. A ratio of 7 GNVQ students to 89 A-level students was not unusual in this study.

One of the larger studies of entry qualifications and their impact on academic performance collated data from 5258 graduates from an unspecified number of British higher education institutions in 1987 (Johnes, 1992). The study found that A-level results had a significant positive relationship with the degree classifications achieved by students across a broad range of subjects. When other factors were looked at, there was evidence that previous work experience had a significant impact on degree results in social science subjects. There was no discussion of any alternative entry qualifications, which reflects the time period of this study. The author also studied the effect of age on degree classifications and found that older students performed better in vocational subjects and languages but less well in engineering and agriculture.

The studies presented in this review have, in general, used a retrospective approach to analysing the impact of age, gender or entry qualifications on the academic performance of students in higher education. Peers (1994), however, designed a statistical prediction model of degree performance based on A-level results on entry, age and gender using national admissions data and the admissions data from the University of Manchester for the year 1988. This large data set of more than 25,000 university entrants represents one

of the largest recent studies of its kind, but caution must be observed given the data were collected over 13 years ago. Logistic regression analysis of the data found that, for all subjects except humanities, the A-level entry point score predicted a significant but variable relationship with degree performance. Peers suggested that age and gender, as well as more complex factors such as modes of study and the learning context, need to be included in any subsequent prediction analysis. He concurred with Johnes (1992) in concluding that student motivation and work experience are particularly related to higher degree classifications in the social sciences. Peers also found that mature students did not perform as well as young students in engineering and technology subjects.

Age-related performance differences between academic subjects

Subject differences have been found in a number of older research studies that investigated the impact of age on student performance. Walker (1975) and Woodley (1984) both found that student performance in the 1970s was affected by the nature of the discipline, with mature students usually doing better in the arts and social sciences, but doing less well in science and maths. Sear (1983), who examined university data from across the UK in 1979, found that younger students performed particularly well in engineering and medicine. Bourner and Hamed's (1987) more inclusive study has the advantage of using data on all graduates from universities, colleges and polytechnics for the year 1983. The mature students in this study gained more first-class honours degrees (39%) than the young students (34%) across a range of subjects. In healthcare subjects and engineering technology, the mature students had lower academic performance than the young students. However, given the age of this study, the healthcare course referred to in this article is more than likely to be medicine and unlikely to include occupational therapy, physiotherapy and nursing, because these healthcare subjects did not achieve full university integration and degree status until the late 1980s. With the exception of Walker (1975), all the studies cited above have used data from more than one university, thus lending some measure of external validity to the findings, although caution is advised when making generalisations from the more dated studies.

THE RELEVANCE FOR HEALTHCARE EDUCATION

In summary, the general body of literature reviewed so far has looked at the impact of age, entry qualification, gender and subject speciality, and has found that, in most cases, mature students perform as well as and frequently better than the students entering higher education at the age of 18. Mature students over the age of 25 who enter with non-traditional entry qualifications, recent academic endeavour and work experience perform particularly well. These findings have implications for healthcare programmes that attract a significant number of mature female students with alternative entry qualifications who are highly motivated and have relevant work experience. The next part of this section of the chapter looks at the literature from an allied health perspective to determine whether age and associated factors have an impact on performance in these professional courses. The central focus of this thesis is the education of the allied health professional, in particular occupational therapists, but, for purposes of comparison, reference is made to nursing and medical education literature where appropriate.

Age-related success in the education of healthcare professionals

A review of healthcare literature reveals a paucity of research that looks directly at the link between age and performance in university. For the North American and Australian literature, this gap in the research evidence can be explained by recruitment patterns that translate into few mature students on healthcare courses (Strickland, 1987). However, in the UK the number of mature students on such courses is more significant (COT, 2001a). Thus an exploration of age as the primary focus of a study that investigates academic and professional performance is long overdue. A number of studies have investigated the impact of entry criteria on academic performance and some have included age as one of those criteria.

One study looked directly at the number of mature students accepted into physiotherapy programmes across the UK for the year 1987. Young (1990) examined admissions data relating to older applicants, which comprised 21% of the total applicant pool. This percentage was mirrored in the number of mature students accepted on to physiotherapy programmes for that year. Although wide differences across individual physiotherapy schools existed in the final data, the study found that mature male applicants were more likely to be accepted than younger men. No reasons were provided to explain this finding. This age difference was not observed for female applicants.

Other studies have investigated age and academic performance, but only as one of a number of admission variables in researching outcomes of healthcare education. Two studies looked at the impact of A-level biology on academic performance in occupational therapy education. Tyldesley (1986) analysed seven cohorts of occupational therapy student data (n=357) from 1977 to 1984 to see whether those students who entered with A-level biology gained higher grades in anatomy and physiology courses compared with students admitted with an O-level in this subject or those with no qualifications in biology at all. The results showed no consistent advantage to having an A-level in biology on entry, although the statistical analysis of these data was very cumbersome. Tyldesley had three categories of students in the study, but only examined differences between the two groups who had some school biology on entry. The third 'no biology' group was not included in the data analysis, which was surprising because many mature students enter occupational therapy without this subject and their performance on the course would have been interesting to explore.

Howard and Watson (1998) also explored the potential influence of A-level biology. Their sample of 47 occupational therapy graduates showed that the age and entry qualification, with or without biology, had no impact on the final academic award. But an interesting finding of this study is the correlation between age and the grade achieved on a first-year physiology assignment and then the subsequent relationship between these marks and the final degree performance. Student age as a separate factor was not fully analysed in this study owing to the limited two-variable approach to the statistical analyses. A partial correlation analysis or multiple regression analysis could have been a useful tool to examine the effect of age on both the first-year physiology scores and the final degree scores. Howard, in a later study investigated the impact of all types of academic entry qualifications on subsequent academic performance in occupational therapy and physiotherapy education at the University of East Anglia (Howard & Jerosch-Herold, 2000). Students entering the programmes with A-levels were awarded an A-level entry score. In this later study no correlational relationship ($r = 0.04$) between this A-level score and the final degree academic average was found in the data. The final occupational therapy academic averages were then compared between the A-level group and the non-A-level group, which included those with Access courses, BTec qualifications and degrees. No statistically significant difference was found between the two groups. However, a statistical difference was found when the same analysis was carried out with physiotherapy students. The academic performance of a previous

degree holder might be expected to supersede an A-level student, but categorising the degree holders with all other non A-level entrants negated any academic edge that could be shown by the students who entered with a previous degree. Although Howard's two studies do not fully address the variable of age, they do highlight the impact of entry qualifications on levels of academic performance in physiotherapy; a potential confounding variable in any analysis of age-related success in healthcare education. Kerr (1985) also found a significant relationship between A-level entry grades and the subsequent performance of 49 students on a BSc (Hons) Physiotherapy in Northern Ireland. In medical education, A-level grades were not seen to be predictive of individual student performance, but could be used to predict success or failure to complete the course (McManus & Richards, 1986). Interestingly, their study of medical students also found that mature students performed better than school leavers on the course.

The effect of entry qualifications on occupational therapy educational outcomes was the subject of a master's-level thesis. Stoneley (1995) investigated the hypothetical effect of raising the entry criteria for an existing cohort of students. The results found that a number of students on their current BSc (Hons) Occupational Therapy degree course would no longer be eligible for entry on to the programme if the new raised criteria were introduced, even though they were performing well academically on the degree programme. The author concluded that entry qualifications do not always predict success in occupational therapy education. Although Green and Waterfield (1997) reached the same conclusion in their study of physiotherapy students, they found that mature students were highly represented in those that achieved a first-class honours degree. Further analysis of this mature student group showed that those students who had entered with a degree were more likely to achieve a higher degree classification than other mature students. They conclude that 'previous experience in higher education has a greater value than maturity alone' (p. 479). This trend was also seen in medical education, where Montague and Odds (1990) found that having a degree on entry to medicine correlated with superior performance in the early years of medical school where the focus was more academic than clinical.

Several North American researchers have investigated the impact of entry qualifications on university performance in healthcare programmes across the US and Canada (Birdle, 1987; Nayer, 1992; Payton, 1997; Posthuma & Sommerfreund, 1985; Scott, Chase,

Lefkowitz, Morton-Rias, Chambers, Joe, Holmes, & Bloomberg, 1995). These studies differ greatly from British research as they use the high school or junior college grade point average (GPA) as a basis for entry to university. They do, however, contribute a significant amount of research relevant to student performance on healthcare courses.

The physiotherapy literature presents a comprehensive meta-analysis of the literature from 1983 to 1994, which examined the predictive effect of admission variables on the academic performance in physiotherapy education in the US and Canada (Payton, 1997). The 22 papers analysed in this study suggest that the entry GPA was the only valid and reliable predictor of academic success in physiotherapy education. Only two studies included age in the statistical analyses, and this variable was found to be non-significant in predicting academic performance. Payton calls on therapy researchers to carry out further research across schools to investigate predictors of academic performance as well as clinical competence and job satisfaction in the first few years after qualification. Nayer (1992), who surveyed all 13 Canadian physiotherapy schools, found that 11 schools consider previous academic achievement in the form of a GPA as the most important screening tool to select candidates to physiotherapy programmes.

The relationship between selection criteria and subsequent academic performance in occupational therapy has also been investigated in the US and Canada. A study of the performance of occupational therapy students at Queen's University in Canada found that those students that were selected on the basis of their previous academic grades alone achieved significantly better academic averages and clinical fieldwork scores at completion than students selected by interview, essays and psychometric tests (Birdle, 1987). Posthuma and Sommerfreund (1985) examined the records of 48 students who entered the occupational therapy programme direct from school and compared them with 13 occupational therapy entrants who had some experience in university by taking prerequisite courses or by completing a non-professional degree. Previous academic ability coupled with performance at interview were found to be strong predictors of academic ability in year one for the younger age groups, but, for those students who had some university experience, who were by definition older, previous academic ability alone was the strongest predictor of academic success. These students with university experience may also have had experience in the work environment and life experience, which are considered to be an asset in vocational-type degree programmes that involve significant periods of practice experience or fieldwork (MacDonald & Stratta, 1998).

Alternatively, they may just be familiar with the type and level of academic work required in the university setting. This deduction is confirmed by the findings of a recent study by Kirchner and Holm (1997). They evaluated the performance of 75 occupational therapy students on a master's-level degree and concluded that academic performance in occupational therapy can be predicted by the academic performance observed during their previous undergraduate degree.

North American universities often use essays as a one of range of selection tools for entry to healthcare programmes, leading Scott et al. (1995) to conclude that the GPA and essay scores were the only objective and reliable predictors of academic performance. Berchulc, Wade and Seidner (1989) found that the entry essay scores were the greatest predictors of year one success, contributing 34% of the variance in the regression equation. The end of year one assessment was not described, but if essay-format examinations were used then this would explain why students with high entry essay scores had the best overall performance at the end of the first year. Leonard and Niebuhr (1986) also examined scores achieved on various admission variables in predicting academic success in occupational therapy education at another US institution. Their results found that 46% of the variance in the grades achieved on a first year human anatomy and physiology course were predicted by the admissions variables of GPA and other psychological tests. They conclude that student motivation and maturity must also influence performance on this basic science course, but there was no further discussion on these issues in the paper. Only one study directly analysed the impact of age, with other predictive variables, on the likelihood of successfully graduating from an occupational therapy programme between 1984 and 1986 at the University of Texas (Schmaltz, Rahr & Allen, 1990). Age was not found to be a strong predictor of student success in this US occupational therapy programme but this could be due to the low power of the analysis in a sample of only 82 students. The study concluded that the GPA was found to be predictive of success in the occupational therapy programme, along with the admissions essays scores and results on a psychometric test of cognitive ability.

CONCLUSION OF SECTION 1

The healthcare educational literature has investigated the impact of a number of entry variables on the academic performance of students enrolled on professional degree programmes. The GPA or A-level scores are seen to be the greatest predictors of success in health-related education, but this does not preclude age from having a

significant impact because only a few studies directly assessed age as a predictor variable. In the few studies where it was included, it was not seen to be as strong a predictor of academic performance as was seen in the general education literature. Johnes (1992) found that mature students performed particularly well in vocational-type courses. These types of courses frequently provide a sustained period of supervised work in the field or vocational setting, which may give an advantage to the mature student with life and work experience because the grades achieved during this period of apprenticeship may make an overall contribution to the final degree classification.

Healthcare courses are mandated by their accrediting bodies to provide students with a significant proportion of their education located in the clinical workplace. In this setting, the age-related variables of life and work experiences of the mature student, coupled with high levels of motivation, may have a greater impact on performance. Research has been carried out that investigated performance or levels of competence shown by students in this clinical setting. The findings of these studies are presented in section three but, before this research can be reviewed, the construct of professional competence, plus its definition and measurement, must be discussed.

SECTION 2 PROFESSIONAL COMPETENCE AND HEALTHCARE PRACTICE

This next section of the literature will explore the construct of competence. It aims to define the concept within a framework of higher education – in particular, the field of healthcare education. The section will discuss how competence can be measured and demonstrated in the clinical workplace. This will include literature relating to how frameworks of professional competence are designed and tested for validity.

DEFINITIONS OF COMPETENCE IN THE CONTEXT OF HIGHER EDUCATION

Although many people have written about competence, there is no general consensus concerning its definition. The Unit for the Development of Adult Education saw competence as what people can do rather than what they know, a definition that reflects a behavioural approach to competence that started in the US during the late 1960s (Wolf, 1995). Competence, using this perspective, was described as measurable performance set against quantifiable behavioural objectives, whereas, for other researchers, competence was seen as ‘knowing’ as well as ‘doing’, shown as skilled performance in the context of the real world (Benner, 1982). In Benner’s work, which relates to nursing, competence was defined as the ability to perform a task, with a desired outcome, in the varied circumstances of the real world. This is echoed by Black and Wolf (1990), who defined competence as the effective performance of a role on different occasions, dealing with unexpected events, and in a variety of contexts. Messick (1984), however, differentiated between competence and performance, where behaviours carried out in the real world were classified as skilled performance, whereas competence was the potential to execute skilled performance in unforeseen circumstances. Norman (1991) offered a simpler ‘Know, Can, Do’ hierarchical model of competence. At the lowest ‘know’ level, the professional is aware of the best course of action to take, based on knowledge gained through education. The ‘Can’ level of competence is the ability to translate that knowledge into purposeful action when required to do so. The ‘Do’ level of competence is the daily execution of the task or job, combining the personal attributes and critical thinking required to execute the action in the real and ever-changing world of professional practice. Eraut (1994) describes this type of critical thinking as the necessary meta-processes of professional action and behaviour. Considering competence as a set of personal attributes rather than as a behaviour in itself is seen in the work of Burgoyne (1993) who defined competence as a

personal characteristic that leads to skilled performance. This perspective on competence as a personal trait, or set of traits, is echoed in the work of Mentkowski and Rogers (1993), whose ability-based nursing curriculum at Alverno College in the US aims to develop students' abilities into skilled performance in the workplace and the wider community. These competencies or abilities are the skills, knowledge, motivation, attitudes and values, developed through the curriculum, that cannot be observed directly but that are inferred from skilled performance. Over time, we can see that definitions of competence have moved away from purely behavioural origins and now embrace the personal attributes and critical thinking required for integrated and effective performance on the job (Ilott & Murphy, 1999).

Competence, higher education and the workplace

The importance of personal skills in defining competence in the workplace was highlighted in a study funded in part by the Department for Education and Employment (Harvey, Moon & Geall, 1997). The authors identified a list of desirable graduate attributes, important for success in the workplace, from 184 face-to-face interviews with employers across the UK. Although recognising the importance of the degree qualification, employers from across the public and private sector considered the personal abilities of intellect and a willingness to learn as being more important than subject expertise. These abilities, coupled with communication, teamwork and effective interpersonal skills, were seen as the competencies that enabled new recruits to be successful in the workplace. Australian educational researchers also found that employers stressed the need for universities to focus on developing generic life and work skills as well as the disciplinary expertise (De La Harpe, Radoff & Wyber, 2000). These studies present an employer perspective of 'fitness for purpose' as generic life skills, coupled with subject-specific knowledge, that new graduates can contribute to the workplace and society in general.

While recognising the importance of working in partnership with employers to define competence, caution must be exercised in defining competence as work-based skills similar to those used by employers and industry to award national vocational qualifications (NVQ). Competence achieved through an NVQ qualification uses a system of assessments based on competency statements concerning work, and it focuses on attaining specified outcomes presented in the form of evidence by the trainee.

Barnett (1994) argued that this behavioural approach to competence relies purely on assessing skills performed in the workplace, without a link to thoughts, understanding, reflection and subsequent action, is not a suitable model for higher education to adopt. He clearly states that 'the business of higher education is to develop critical capacities which must include evaluation and possible repudiation of contemporary competencies' (p. 81). Tarrant (2000) was also concerned that the NVQ approach to competence would subvert the learner to the position of future employee equipped with the practical knowledge and skills that are omnipotent in the subject area at that current time. Tarrant warns that a curriculum generated by employers and national quangos may meet the demands of the current economy, but this approach denies the student the opportunity to question knowledge, develop conceptually in their own right or analyse the world around them from a position of theoretical questioning. Using universities to prepare graduates purely for the world of work is, in his view, illiberal and unethical practice in higher education. Bocock and Watson (1994) and Barnett (1994) both expressed serious concerns about any shift towards occupational competence where students are educated for the here and now but may not develop a true understanding of their subject, the deeper skills of critical enquiry, or the confidence to innovate for the future. Maudsley and Strivens (2000) also highlighted the need for a broader interpretation of competence and its relationship to critical thinking in the education of medical students.

Chappell and Hager (1994) suggested that a richer and more integrated understanding of competence could be the link between those that argue for educational freedom, free from occupational influences, and those that advocate an operational, outcomes-based vocational education focus in universities. Ilott and Murphy (1999) also suggest an integrated approach to professional competence in healthcare practice defined by the knowledge and skills of practice and an ability to recognise and operationalise the shared attitudes and values of the profession in the complex realities of the clinical work environment. Stengelhofen (1993) likewise, sees competence as knowledge, skills and attitudes, which encompasses the systematic, reflective and critical thinking required for effective action in a busy clinical environment.

Integration of these attributes into any future definitions of competency would firmly move away from narrow, behaviourist methods that rely only on demonstrable skills and attributes in practice. Definitions of competence that have direct relevance to occupational therapy are not easily found in the literature but the Australian Association

of Occupational Therapists (AAOT) have embraced all the criteria for an integrated definition of competence in stating that:

Competence in professional practice is much more than the accomplishment of a number of discreet and separate tasks. It is a complex interaction and integration of knowledge, judgement, higher-order reasoning, personal qualities, skill, values and beliefs. In their everyday work competent professionals will recall and apply facts and skills, evaluate evidence, create explanations from available facts, formulate hypotheses and synthesise information from a rich and highly organised knowledge base. Professional competency also embodies the ability to generalise competence or transfer and apply skills and knowledge from one situation and environment to another. As such it is a construct, which is both abstract and tangible. (AAOT, 1994, p. 2)

DERIVING A FRAMEWORK OF COMPETENCE IN HEALTH CARE

A clear framework of competence is essential before judgements can be made as to a persons' level of competence. The framework should include statements or standards of competence and be derived from an analysis of everyday employment requirements using a variety of methods such as functional analysis approach, the Delphi approach, nominal group technique or job analysis (Jessup, 1991).

Functional analysis methodology is an approach commonly used to investigate the content of an occupation with a view to clarifying standards and deriving competency statements (Winter & Maisch, 1996). Using this approach, an expert panel is convened to identify the key purpose of the discipline and to generate individual units of professional competency that are defined by performance criteria, range statements and cues. The functional analysis approach provides a time-efficient and cost-efficient way of generating a framework of competent practice in a profession, but it does rely heavily on expert opinion and can be very reductionistic in its approach. It has been used by the Australian Association of Occupational Therapists to develop the association's competency standards for entry-level occupational therapists in Australia and by the Canadian Association of Occupational Therapist in developing the profile of occupational therapy practice in Canada (AAOT, 1994; CAOT, 1996).

An expert panel is also used to elicit consensus opinion in the Delphi method, albeit from a distance. This approach was used to elicit common and shared conceptions of professional mastery in occupational therapy (DePoy, 1990), to identify the role of the occupational therapist in one setting of care (Dawson & Barker, 1995), and as part of

the European Network of Occupational Therapy in Higher Education project to define the curriculum guidelines for education of occupational therapists in Europe (Howard & Lancee, 2000). It was also used to elicit a national consensus on desirable attributes for physiotherapy undergraduates on clinical placement and to compare these findings with the framework for physiotherapy education as published by the Chartered Society of Physiotherapists and the Council of Professions Supplementary to Medicine (Cross, 2001). The main advantages of the Delphi approach is the questionnaire method of deriving expert opinion, which can minimise the 'domination of vociferous' members of an expert panel that can occur in face-to-face meetings (Hollis & Clarke, 1993, p. 105). The Delphi approach gives respondents time to consider their responses to initial questions and to consider in isolation from the other members of the panel the consensus opinion arising from earlier responses.

The key aspect of the functional analysis and the Delphi approach is the use of a convened expert panel to reach consensus on an issue of concern. Using an expert panel to decide competency framework, however, also brings with it the risk of exclusivity if the panel is selected on the basis of narrow or skewed selection criteria. In a practice-based profession, such as occupational therapy, the dilemma is that expert status can be bestowed on diverse and very separate groups within the professional community (Sumsion, 1998). Jessup (1991) recommended that the expert panel include members of training establishments or educators, along with representatives of professional organisations, and employers and employees currently working in the profession. Percival, Anderson and Lawson (1994), in a study that investigated the level of competence display by Australian nurse graduates on entering professional practice, advise researchers to provide a clear rationale for the inclusion of personnel on an expert panel. The panel in their study was chosen for their expertise in State or Territorial law in relation to nursing or their proven ability to define standards and competencies in nursing.

The nominal group technique is an alternative approach that brings groups of interested participants together to discuss and debate issues in a highly formalised procedure that elicits consensus opinion through the mathematical ranking of decisions. The advantage of this approach is that group membership is not limited to designated experts. The nominal group can be ordinary members of the professional groups, but this group technique can give rise to similar issues of status and power in determining group

consensus encountered in group debates (Steward, 2001). The ranking required to generate consensus opinion means that discussion must eventually stop and decision making must take place, and this concession to the formality of the technique can be frustrating to group members, as was experienced by the participants in the occupational therapy studies that used this technique to derive frameworks of competence (AAOT, 1994).

A job analysis approach was used to look at occupational therapy practice in the US (Dunn & Cada, 1998). This study was based on the overarching assumption that analyses of what practitioners do, each and every day, can yield a good indication of the competencies required for practice. A survey instrument was designed using a research and documentary literature review and consultation with 100 occupational therapists nominated from special-interest groups from within the profession. The resulting survey questionnaire was mailed out to 4000 licensed occupational therapists and 3000 occupational therapy assistants across the US. Respondents were asked to describe their practice and to rate the frequency of tasks performed and knowledge used. The results show that 75% of the 96 knowledge and skill statements in the questionnaire were rated as at least 'moderately critical' to occupational therapy practice, thus affirming the content validity of the competency framework that arose from the job analysis. This large-scale study of practice, which had more than a 50% response rate, served as a valid reflection of current practice. The authors state that findings could also be used to inform the development of other measures of professional competency such as global rating scales of competence or the updating of a national certification examination.

In methodological contrast to the analytical approaches outlined above, Benner (1982) suggested a hermeneutic approach to competency analysis using narrative methodology, whereby practitioners are observed and also asked to narratively explain the thinking involved in carrying out their daily role as a professional. Although time consuming and labour intensive, this approach has some advantages because it goes beyond observable behaviour towards an analysis of the underlying cognitive process required for effective and competent clinical practice. This integrated approach also has the added advantage of being able to discern marked differences in levels of competence across the various grades of professionals, as was found in the occupational therapy clinical reasoning study carried out by Mattingly and Fleming (1994). To this end, competency framework developers would be more readily able to discern what constitutes novice practice as

opposed to advanced practice and thereby acknowledge the beginning-level abilities of the newly qualified practitioner.

In summary, different methods have been used to generate frameworks of professional competency across the world. Some relied heavily on the opinion of experts whereas others took a more 'bottom-up' approach and analysed practice from the perspective of practitioners in the clinical field. There are inherent risks associated with the latter approach if frameworks of professional competency evolve from and reflect only current practice. As frameworks of professional competency are used to inform university curricula they need to reflect future practice as well as current practice. The significant advantage of the expert panel approach in standards development implies a representation from the seminal leaders and creative thinkers in a profession, who can influence an emerging conceptual model of competency with their vision and research into new professional knowledge (Yerxa, 1994). The expert panel approach was used to develop the Benchmarking Academic and Practitioner Standards in Health Care Subjects discussed below (QAA, 2001).

COMPETENCE AND THE EDUCATION OF HEALTHCARE PROFESSIONALS

The NCIHE recommended a broad range of measures that continue to have an impact on the delivery and quality of higher education. One of these recommendations was that the Quality Assurance Agency (QAA) establish 'subject expert teams' to develop benchmarking statements for the main subject areas in higher education (NCIHE, 1997). They were given the task of developing statements that best represented the general intellectual outcomes and attributes expected of a new graduate in a given subject area. These statements would specify the nationally agreed threshold standards against which individual institutions would set their own qualifications framework and programme specifications to meet the standards set for awarding a degree. Institutions could thus provide intending students, employers and significant others with a clear and precise statement of the intended learning outcomes of the programme that sets out the standards that might be expected of graduates in that subject area. This external quality-assurance mechanism should provide the public with the reassurance that a graduate of any British university has the knowledge, skills and attributes commensurate with a nationally recognised qualification which has been benchmarked to externally agreed standards in that subject area.

Healthcare benchmarking statements

For most subject areas at university these benchmarking statements represent the agreed national academic standards that signify 'graduateness' from a higher education establishment. But in healthcare education, where fitness for award is coterminous with fitness for professional practice, these benchmarking statements are much more than academic standards. Therefore, the 11 healthcare subject expert groups included nominated representatives from the appropriate professional associations, as well as the statutory regulatory authorities for the healthcare professions. The subject benchmarking statements for healthcare provide higher education institutions with the minimum academic and practice capabilities that must be achieved in order to achieve the academic award and the licence to practise. They outline the threshold standards of competence expected of a healthcare professional on entering their first post immediately after qualification. Although the benchmarking statements for occupational therapy now provide a framework of professional competence in occupational therapy in the UK, the issue of how these theoretical constructs and operational definitions of

threshold competence can be actually measured is still left unresolved. It is incumbent on the professions in the UK to take the next step and develop nationally agreed measures of professional competence to avoid the tenuous conclusions of Burrows (1989), who stated that competence 'is recognisable more by its absence than by readily available measurable behaviours' (p. 222). Although the process of developing a framework of competency is an exacting task for any professional group, a framework can serve as a blueprint for a professional curriculum and form the basis for the entry-level assessment required to show professional competency (Searle, 2000).

The Australian Association of Occupational Therapists identified and validated competency standards for entry-level occupational therapists in Australia, but added a second phase to the project to develop and pilot a number of competency assessment measures (AAOT, 1994). Although the study tested nine different approaches to measuring competency, there was no conclusive decision as to which method provided the best means of assessment. The challenge to the healthcare professions in the UK is how to use benchmarking statements to develop valid and reliable measures of professional competence.

The measurement of competence in the healthcare professions

Current healthcare literature is in agreement that competence includes the knowledge, skill, judgement and behaviours required of effective practice. Norman's integrated 'Know, Can, Do' model of competence is mirrored by a hierarchical assessment structure for the measurement of this construct (Norman, 1991). Written examinations or multiple-choice examinations can be used to assess 'knowledge' but may be heavily reliant on recall rather than providing evidence of critical thinking, particularly if the questions require factual answers. Examinations can be predictive of performance in clinical settings (Elstein, 1993; Markert, 1993; Van der Vleuten, van Luyk & Beckers, 1989) but they can infer ability only at the 'can' or 'do' level of competence because clinical performance is not directly measured. Direct observation in practice is required before judgements can be made at the 'can' level of competence, but these are often based on one-off observations carried out with real or simulated clients. The fully integrated 'do' level of competence is practice in the real world where the practitioners are assessed for consistent levels of ability in the knowledge, thinking, skills and behaviours of professional practice on a day-to-day basis. Norman suggests that the 'do' level of competence can be measured by trained assessors using a critical incident

technique or a behavioural event interview or by combining the personal interview with a chart review in the chart simulated recall method developed for use in peer review of physicians in Canada (McClelland, 1978). Although acceptable levels of inter-rater reliability can be achieved by using trained assessors, these interview-based methods are very time intensive and expensive to implement as they endeavour to uncover the critical thinking that guides professional action and decision making. Therefore, Norman suggests that global rating scales can be used to assess this highest 'do' level of competence, where supervisors rate the level of ability or competence of their employees on all domains of competence over an extended period of time.

Hager et al. (1994) also presented a framework by which competence can be measured. They also viewed the assessment of competence as an ongoing process and not as a one-off event or test. They suggested the use of a data-gathering tool derived from a priori competency standards. The data should be collected using systematic observation and should be used solely for the purpose of making a decision about the individual's performance in relation to the set standards. They admit that this criterion approach to measurement, which relies on the judgement model rather than on a purely objective measurement paradigm, 'has led some people to worry that professional judgement may not be objective enough and hence that the resulting assessment may be unreliable and/or invalid' (Hager et al., 1994, p. 13). But support for use of judgmental ratings of competence using global rating scales is provided by Eisner (cited in Keynan, Friedman, & Benbassat, 1987), who argues that subjective expert opinion is a superior approach to use when competence incorporates both the science and art of practice. Mitchell (1989) concurred with this view, by acknowledging that the assessment of professional competence relies more on the notion of expert judgement than on the scientific measurement of performance. Nevertheless, Ashworth and Saxton (1992) acknowledged the human problems of stereotyping, biases, prejudices and judgement errors that can arise when assessing the performance of others.

Global Rating Scales – issues of reliability and validity

There is growing support for the use of supervisor ratings using global rating scales in the measurement of professional practice, but it is recognised that these are subjective in nature and prone to observer bias (Streiner & Norman, 1995). The reliability of these global rating scales has been a cause for concern and has thus prompted some medical educators to systematically compare supervisor ratings of ability against more objective

measures of the clinical performance of medical students (Keynan et al., 1987; Norcini, Webster, Grosso, Blank & Benson, 1987; Pearson, Rolfe, & Henry, 1998). These studies all found that ratings on a global rating scale were moderately correlated with performance on other measures of clinical ability such as written and practical examinations; the correlation coefficients varied from 0.23 to 0.37. The strength of this relationship may, however, highlight that the global rating scale can assess the 'know' level of competence as effectively as an examination, but it does not provide evidence that they can truly assess at the 'do' level of competence. Any checklist of ability is only as good as the list of items included on that list, so it is imperative that a global rating scale be inclusive of all the knowledge, skills, attitudes and critical thinking required of profession-specific practice (Hager & Gonczi, 1996). Clear identification of the dimensions of professional practice is therefore an essential first step in designing a valid global rating scale to measure competence in professional practice. A nationally agreed framework of professional competence can provide detail on the domains of knowledge, skill, judgements and behaviours required for that job or profession and can thus be used as the basis to design and select the items to be included in a global rating scale. But the investigator must ensure that the framework truly reflects the scope of practice at the time and place in which the measurement is being carried out. The importance of using existing frameworks or standards for practice instead of developing new domains of competence in each research study cannot be understated. If an existing framework is not available, then it is incumbent on the tool developers to clearly specify the knowledge, skill, judgement and behaviour domains at the onset of the study and thus verify the content validity of the assessment tool.

Measuring competence in healthcare practitioners – methods, reliability and validity

Cotrell (1990) investigated the perceived competence of occupational therapists practising in mental health in Canada by designing a questionnaire using a four-point rating scale to measure competence in this specific area of practice. The content was derived from a review of the relevant literature followed by verification by an expert panel of occupational therapists with at least 5 years' experience in this clinical setting. If the study were to be repeated, the author could now use the Canadian guidelines for client-centred occupational therapy practice in mental health that were rigorously tested before publication to ensure high face value and content validity (CAOT, 1993). Nurse researchers have measured the competency of nurses by adapted an existing of

competency tool- the Schwirian 6-D Scale, to form the basis of a more up to date measure of nurse competency (Bartlett, Simonite, Westcott & Taylor, 2000; Battersby & Hemmings, 1991; Kawczak- Hagerty, 1992; McCloskey, 1983).

The Schwirian 6-D Scale was developed in the late 1970s and has been rigorously tested for reliability and validity (Schwirian, 1978). It consists of a 52-item questionnaire developed from a literature review of nursing practice, consultation with deans of nursing schools and experienced and knowledgeable nurses from a range of settings. The Schwirian 6-D Scale was tested for content validity in 1978 but nursing practice has changed significantly since that time. Bartlett et al. (2000) used the Schwirian 6-D Scale to inform the development of their global rating scale of nurse competence, but they also confirmed the current content validity of their tool by consulting with a expert panel of nurse academics and senior nurse practitioners. This also served to contextualise the new rating scale within the culture of British nursing as opposed to the US nursing practice model from which the Schwirian 6-D Scale was developed.

The competence and fitness to practice of occupational therapists and physiotherapists was explored in a study commissioned by the Department of Health in the UK (Barnitt & Salmond, 2000). The results reached consensus opinion that competence was not an easy concept for employers to describe. The authors urged prompt discussion with regard to threshold or entry-level competencies within professional groups, this has now been met by the publication of the QAA subject benchmarking statements for the healthcare professions (QAA, 2001). Prior to this the only standards available for occupational therapy were those outlined in the curriculum framework of the College of Occupational Therapists (COT, 1998). The curriculum framework of the College of Occupational Therapists was published as the culmination of a literature review, documentary analysis and the opinions of an expert panel. The framework defines the abilities required of an occupational therapy student to be eligible for state registration as an occupational therapist, and it therefore delineates the threshold competencies required for entry into the profession of occupational therapy. The guidelines were not subjected to content validity testing as they were seen merely as a source of reference for educational establishments (V. Hollis, personal communication, 18 January 2000). The limitations of a framework derived solely from documentary analysis and expert opinion, but without field-testing must be acknowledged.

CONCLUSION OF SECTION 2

This section of the literature review explored definitions of competence and saw that early descriptions were behavioural in approach having become more integrated over time, by encompassing the less observable traits of critical thinking, attitudes and values of a professional group. Frameworks of professional competence in healthcare were seen to be a necessary precursor to the development of contextually valid measurement tools to assess competency in clinical settings. The professional judgement of supervisors using global rating scales emerged as one of the more time-efficient means by which the integrated, 'do' level of competence could be measured. The next section of the review will return to the construct of age, and will explore differences in levels of clinical competence in students and novice practitioners using a range of competence measures cited in the literature.

SECTION 3 FACTORS INFLUENCING LEVELS OF PROFESSIONAL COMPETENCE

This final section of the literature review looks at the relationship between academic performance in university and performance in clinical settings. Age-related issues will be explored when discussing the transition between the academic world of the university and the realities of professional employment for these new practitioners as the process of transition may impact on levels of threshold competence. Employers' perceptions of the professional competence of recent healthcare graduates will also be reviewed in this final section of the literature review. The review will also look at other factors or confounding variables that may influence levels of academic performance or clinical competence. The chapter concludes by summarising the key issues emerging from the review and highlights the gaps in the research evidence that will be addressed in the research study presented in this thesis.

LINKING ACADEMIA WITH PRACTICE TO PROMOTE COMPETENCE

The importance of the university curriculum in ensuring competence in the graduate healthcare professional cannot be understated. The literature highlights the need for closer links between university-based education and education in the clinical setting. Richardson (1992), along with Hunt, Adamson, Higgs and Harris (1998), called for a review of current physiotherapy teaching so that physiotherapy graduates have the skills for professional survival in a healthcare environment that is constantly changing. They urged universities to explore any discrepancies that may exist between the taught curriculum and the competencies required in professional practice. Peloquin and Abreu (1996), on the other hand, placed the responsibility at the staff or faculty level in their US University system. They proposed a number of practical strategies to establish meaningful connections between the worlds of academia and clinical practice, such as collaborative research and consultant role positions – a theme that is echoed on this side of the Atlantic by *Meeting the Challenge: A Strategy for the Allied Health Professions* (Department of Health, 2000). This UK government strategy paper outlines a commitment to stronger partnerships between universities and clinical practice by suggesting more joint appointments and the expansion of practice placement opportunities in all sectors of healthcare. This recent government directive for the allied healthcare professions is set in the context of national reform of nurse education through publication of *Fitness for Practice* (UKCC, 1999) and *Making a Difference*

(Department of Health, 1999), two strategy documents that urge stronger links between the university curriculum and the nursing skills required to function competently in the clinical environment.

THE RELATIONSHIP BETWEEN ACADEMIC & CLINICAL PERFORMANCE

Healthcare courses are mandated to provide students with a significant proportion of their education located in the clinical workplace. This has prompted researchers to investigate student performance in these practice-based or fieldwork settings as well as in the academic setting of the university. Although the studies reviewed do not separate mature students from students entering under the age of 21, they do provide an insight into how levels of performance in the clinical setting can be related to life experience.

Those involved in the education of occupational therapists are required by the World Federation of Occupational Therapists (WFOT) to provide 1000 hours of assessed practical experience to ensure that students' fitness for academic award truly equates with fitness for practice so that they demonstrate an acceptable level of professional competence on qualification (WFOT, 2002). Students are assessed in both settings, but not every British university includes these fieldwork grades when determining the final academic average and subsequent degree classification (Westcott & Rugg, 2001). For some universities, academic outcome is based on academic merit alone, but other universities include performance in practice in the final degree average. The impact of fieldwork grades on the final academic average has been investigated at Oxford Brookes University. Analysis of the occupational therapy data showed that 15% of graduates would have been awarded a lower degree classification if their fieldwork grades were removed from the aggregation process, and only 0.9% would attain a higher degree classification in these circumstances (Shanahan, 1995).

A number of occupational therapy researchers have investigated the relationship between academic performance at the university and performance on student fieldwork placements. Although this research is rather dated, the consistently weak relationship between the grades achieved in these two separate educational settings is shown across numerous US studies (Anderson & Jantzen, 1965; Ford, 1979; Mann & Banasiak, 1985). Only Katz and Mosey (1980) found a moderate correlation ($r = 0.4$) between academic and fieldwork grades at New York University between 1974 and 1979. It must

be noted that the academic curriculum taken at that time would have little resemblance to current trends in occupational therapy education. A more recent study found that academic course grades were poor predictors of fieldwork performance and suggests that variables such as the students' learning style, motivation and personality traits could all have an impact on how students perform on the fieldwork component of US occupational therapy programmes (Best, 1994). Kramer and Stern (1995) also found no correlation between academic and clinical performance in a review of six studies carried out since the 1950s.

Posthuma and Noh (1990) focused their study on entry qualifications and found the Canadian occupational therapy students who attained higher fieldwork grades were those selected by interview as opposed to those selected on the basis of the high school GPA alone. However, this finding might be a reflection of the tool used to rate fieldwork performance, because a fieldwork rating scale biased towards an assessment of interpersonal skills is more likely to assess the same traits demonstrated at an admissions interview. A recent British study (Howard & Jerosch-Herold, 2000) investigated the impact of academic entry qualifications on the scores achieved by 168 occupational therapy and physiotherapy students on both the academic and fieldwork components of their degree. No correlational relationship was found between entry qualifications and rating scores of clinical competence in fieldwork, but they did find a moderate relationship ($r = 0.56$) between academic performance at the university and fieldwork ratings. This finding may suggest that, whereas in the past different attributes and abilities were assessed in the two settings, professional education today has been successful in achieving greater integration between theory and practice. Despite this recent study, the limited body of research evidence in this area demonstrated a weak relationship between academic performance at the university and performance in clinical settings.

An investigation into results on various assessments at the Newcastle University Medical School in Australia and the performance of medical doctors during their internship year (the first year after graduation) produced findings worthy of comment (Pearson et al., 1998). Newcastle University uses a problem-based medical curriculum and, therefore, a number of non-traditional measures were assessed in the undergraduate education programme. However, it was only the more traditional domain of illness identification, prevention and management that were seen to relate to performance in

the clinical workplace. The study thus recommended a full review of the assessment procedures used at the university so that they equated more closely with the real world of medical practice. With regards to age-related issues, two earlier studies carried out at the Newcastle medical school found no relationship between the age of the applicant and their subsequent performance in medical school or ratings of clinical performance during the internship year (Neame, Powis & Bristow, 1992; Rolfe, Pearson, Powis & Smith, 1995).

Three US-based studies of medical students found closer links between performance in medical school and subsequent supervisor ratings of clinical competence. Blacklow, Goepf and Hojat (1993) analysed student position on a class-ranking model of medical students with their subsequent position on a ranked evaluation of their clinical competence completed by residency directors. They observed a considerable overlap (85% concordance) in the positions of the students in the top and bottom quarters of the university ranks and their relative position on the ranked list of postgraduate competence. Norcini et al. (1987) looked at the relationship between clinical competence and academic ability from a different perspective, and found a moderate correlation ($r = 0.35$) between physician supervisors' ratings and the performance of the new graduate on Medical Board Examinations. Markert (1993) found that medical school performance was not strongly correlated with physician supervisors' ratings during residency but was related to graduate performance on National Board Medical Examinations taken one year after graduation. This statistical relationship between performance on examinations taken after leaving university and supervisors' rating of competence underscores the validity of the post-qualifying registration examination in assessing the true skills and knowledge demanded of practice. Likewise, the absence of any consistent relationship between undergraduate achievement and clinical performance after graduation does raise concern over the validity of curricula in some medical schools. Student self-ratings of clinical competence were not related to external measures of academic ability. Woolliscroft, TenHaken, Smith and Calhoun (1993) found that medical students' self-ratings of clinical performance in the practice setting were not correlated with their academic performance prior to or during medical school. An interesting phenomenon occurred in this study, whereby the medical students who rated themselves with the highest clinical skills were those with the lowest levels of academic performance. The authors interpret this inverse relationship as a possible defence mechanism used by students who have lower levels of academic achievement

than their peers. They also acknowledge that self-ratings questionnaires may be interpreted by students as a measure of their perceived effort or potential performance rather than a true reflection of their ability.

The nursing literature also compared levels of academic achievement in nursing school examinations and the US nurse licensure examinations to supervisor ratings of competence using the Schwirian-D scale scale (McCloskey, 1983). No relationship was found between examination performance and the competency ratings but the length of time spent in nurse education was strongly related to nurse performance in the clinical setting. Those nurses who had completed associate nurse training followed by a baccalaureate degree were perceived to be the most competent nurses in this study. Although not discussed in the study, these nurses would be older and this age-related effect and the potential confounding effect of extended years in formal nurse education with extensive practice-related experience on the wards should have been explored in this study. Williams and Snider (1992) studied nursing graduates after four to six years of working in professional practice. Differences were found between those who qualified with honours nursing degrees and those with non-honours awards. Honours graduates were statistically more likely to be involved in research, to have registered for graduate studies and to be in positions of leadership after four years in practice. The route to qualification and level of education taken are thus seen to impact on levels of professional competence after graduation.

TYPES OF UNIVERSITY EDUCATION & THEIR IMPACT ON COMPETENCE

Various modes of study and routes to achieve state registration as an occupational therapist exist in the UK. Most English and Welsh students graduate from three-year full-time honours degree programmes, whereas Scottish and Northern Irish students complete a four-year full-time honours degree. The primary reason for this difference is NHS funding arrangements. The in-service route provides an opportunity for those working as occupational therapy assistants to undertake a four-year honours degree on a part-time basis, usually a two-day release from their employment. Two-year accelerated courses for graduates, either at the BSc (Hons) Occupational Therapy and postgraduate diploma level, are also available. One graduate master's-level entry route exists in

Scotland. Currently all occupational therapy programmes in the US are offered only at master's graduate entry-level, and from 2008 this will also apply in Canada (CAOT, 2002; Steib, 1999).

Prior to the introduction of master's level only education for occupational therapy entry, US researchers were interested in comparing graduates by the different routes to occupational therapy qualification that existed at that time. Although the education of occupational therapists in the US differs from the British model, it is still interesting that research has explored the impact of differing routes to professional qualification on professional outcomes. Rogers, Brayley and Cox (1988) surveyed 227 experienced occupational therapists on their levels of engagement in a range of professional activities. Even when controlling for length of work experience, their results found no significant differences in the clinical practice activities, product development or awards for professional recognition among those that took a bachelor's degree, master's degree or post-baccalaureate certificate route to qualification as an occupational therapist. But differences were noted between the bachelor's and master's groups, where master's graduates were more likely to be involved in administration, leadership, research and publications. Although it was not highlighted in the study, these master's graduates were also likely to be older than the other students.

Similar results were found by Hayes-Fleming and Piedmont (1989) in a survey of 2000 occupational therapists working in the US. They found that those graduates with bachelor's degrees felt significantly less prepared in management, critical thinking and aspects of professionalism than those educated by the occupational therapy master's-level route. Interestingly, when asked what areas of occupational therapy education needed more emphasis in the curriculum, the bachelor's and associate degree-level graduates indicated clinical practice skills, but this was considered the least important professional skill for the master's-level and doctoral-level graduates. All respondents, irrespective of education route, indicated no area in which they felt especially prepared on entering practice for the first time, with the bachelor's degree group feeling the least prepared of all. This finding was not discussed in Allen, Strong and Polatajko's (2001) opinion paper of the perceived benefits of occupational therapy master's programmes. They see the master's route as producing graduates who have 'an increased competency to provide for the health-care needs of clients' and 'be better equipped to meet the professional challenges of the 21st century' (p. 575, 576). The CAOT position statement

on entry-level education of occupational therapy also sees greater accountability for decision making and professional autonomy as the advanced-level skills expected on graduation from a master's-level programme in Canada. But Waters (2000) contends that entry-level master's degrees in the US can be seen to equate with a BSc (Hons) degree in occupational therapy in the UK. A true master's-level education, she argues, should provide the opportunity for depth and breadth of study, alongside the development of mastery in specific topic areas. But are these sophisticated conceptual skills what employers expect of new graduates in the UK? Occupational therapists in Iceland valued academic skills over technical skills, but this was not found to be the case in the UK (Asmundsdottir & Kaplan, 2001; Barnitt & Salmond, 2000).

Employer opinion was explored by Kenyon and Ilott (1997) when evaluating the effectiveness of one in-service programme in the UK. In-service students study part-time at university while maintaining their jobs as occupational therapy assistants. Data were collected after one year in qualified practice from 23 in-service graduates, their current line managers and the sponsoring authorities. Fitness to practice was measured using a four-point Likert scale derived from the curriculum framework document of the College of Occupational Therapists (COT, 1993). Comments from the stakeholders referred to differences in levels of competence between the in-service graduates and those from full-time educational programmes. In-service graduates were considered well prepared for entry into the profession, being more confident and having more clinical knowledge than graduates from full-time programmes. Confidence on entering practice was also highlighted in the graduates' self-ratings of competence. The authors attributed this enhanced level of confidence to the previous life and work experience of the in-service graduates, who are, by definition, mature students. However, caution in interpreting concepts of confidence and competence is advised by Stewart, O'Halloran, Barton, Singleton, Harrigan and Spencer (2000). They looked at perceptions of confidence and competence in medical graduates and found that negative expressions of confidence are not always directly related to lower levels of competence. They conclude that any form of self-evaluation will be influenced by beliefs in one's self that may or may not equate with ability. Indeed, Woolliscroft et al. (1993) found that medical students' self-ratings of clinical performance did not correlate with residents' ratings of their ability. This led the authors to conclude that self-perceptions of ability are influenced by a number of factors and do not always equate with external measures of

competence. Interestingly, this study also found that mature medical students rated their ability as lower than the under 21-year-olds for independent learning, which highlights the link between levels of confidence and self-ratings of ability in the mature student group. This finding relates to an earlier discussion in this chapter where mature students were seen to have low levels of confidence in academic work, but are able draw on their previous life and work experience to enhance their performance in new work settings (Challis, 1976; Burns et al, 1993; Daines et al, 1993; Edwards, 1990; MacDonald & Stratta, 1998; Pascall & Cox, 1993). Self-perceived levels of knowledge and skills can thus influence feelings of confidence, and this can have a major impact on the transition between university and workplace for a new healthcare graduate. Alsop (1996) warns how confidence and familiarity with occupational therapy service delivery could mean that in-service students are given responsibility beyond their level of ability and are subsequently overwhelmed. Alsop was writing in the context of the in-service student moving from the university to the fieldwork component of their degree, but newly qualified in-service graduates may experience similar levels of anxiety in an unfamiliar clinical setting.

STUDENT PERCEPTIONS OF THEIR TRANSITION INTO PRACTICE

This transition between university and professional practice is an important issue that has been researched from both the quantitative and qualitative perspective in the healthcare literature. Two Australian studies at the University of Sydney highlight the issue for occupational therapy graduates. Adamson, Hunt, Harris and Hummell (1998) surveyed 502 occupational therapy graduates in the years 1991 to 1993. When asked whether they felt prepared for their professional role after qualifying, the graduates indicated that they felt confident in the clinical role and in the essential tasks of occupational therapy service delivery as well as communicating with clients/carers. But they felt less prepared to communicate with other health professionals, implement management skills in the workplace and did not have a clear understanding of the health industry. The response rate was very low in the study, at 28%, and might be biased by those respondents who felt less prepared for practice, wanting to give this feedback to their university. The mean age of respondents was 24.9, with a standard deviation of 3.5, which reflects the demography of occupational therapy students at programmes in Australia (Allen et al., 2001). In a later study, Hummell and Koelmeyer

had a higher response rate (62%). This study specifically addressed issues such as orientation and induction, supervision and the transition process. The 74 occupational therapy graduate respondents stated that their transition into work was challenging and would have been assisted by having more knowledge and skills taught at university. The authors stress the importance of supervision during the initial six-month period of adjustment, where effective support can enable the new graduate to feel confident in their role and achieve job satisfaction (Hummell & Koelmeyer, 1999).

Parker (1991) investigated the initial perception of occupational therapy graduates from all three Scottish universities in 1986. No sample size was provided in this study. Graduates had been working, on average, for a period of six months. Fifty-four per cent responded to the survey, which is an acceptable response rate for a postal survey (Stein & Cutler, 2000). Results showed that graduates were apprehensive about their perceived lack of practical experience and the need to take sole responsibility for making decisions. As far as could be ascertained, the graduates were all from full-time programmes, but even in Kenyon and Ilott's (1997) study of in-service students cited above, graduates indicated that taking responsibility is daunting when newly qualified, even if you are familiar with the clinical role of an occupational therapist. The transition from student to therapist was also seen as a source of stress among newly qualified occupational therapists in a survey of Welsh occupational therapy graduates in 1995 (Leonard & Carr, 1998).

Although somewhat dated, the approach taken by Allen and Cruickshank (1977) suggested how to translate the daily dilemmas of this transition period into a positive learning experience for both the new graduate and the university curriculum developer. In their study, 100 randomly selected recent graduates completed a problem checklist for occupational therapy practice over a period of five clinical workdays. The problems identified resulted in the development of a 96-item problem identification checklist that was mailed to a random sample of 2300 newly qualified therapists across the US. The findings of this nationwide study indicated that new graduates felt competent in basic treatment planning and implementation but that they had difficulties with time management, self-confidence, collaborative working and communication. This tool provided the new therapists with a purposeful and positive means by which to voice their opinions about the realities of practice. However, the response rate for this study was low at 26%, and any modifications made to the occupational therapy curriculum

based on these results could be biased and not reflect the problems experienced by the non-respondents.

Atkinson and Steward (1997) found that new occupational therapy graduates felt adequately prepared for their role as occupational therapists, but that they identified deficits in self-management skills and specific areas of practice where they felt less confident, such as specialised assessments or dealing with atypical clinical situations. The graduates felt equipped to seek out necessary information and take responsibility for personal professional development. This confidence in information-seeking skills reflects the move away from technocratic to post-technocratic education, where students are equipped with the skills for life-long learning (Bines & Watson, 1992). The issue of confidence is also reflected in Rugg's (1996) study of recently qualified occupational therapists, where graduates felt more competent than they expected to when treating clients. This finding implies a certain lack of confidence on entering clinical practice, which has reverberated across all the quantitative studies cited above and is explored in depth in a qualitative study by Tryssenaar (1999). In this Canadian single case study, the new graduate was worried about her lack of practical knowledge and hoped that she projected an aura of confidence in the workplace. In a later study, Tryssenaar and Perkins (2001) explored this issue further with six recent therapy graduates, who provided rich qualitative data in reflective journals written during their final fieldwork placement and their first year as graduates in practice. The themes that arose from the data related to perceptions of competence and educational preparation. These six graduates also felt lacking in competence initially, particularly for some clinical skills, but felt that their education had equipped them with responsibility for their own learning. The shock of the reality of practice was also echoed in this study. It was expressed as anxiety about carrying out specific treatments as well as concerns about the speed and pace of practice. The participants had expected practice to be less stressful than student life and were thus surprised by the added stress of interpersonal dynamics in the workplace. Tryssenaar and Perkins observed through the diaries the process of adaptation that occurred during the first year of practice. They witnessed how the new graduates ultimately overcame some of the difficulties associated with the transition from student to qualified practitioner. The huge advantage of the diary method of data collection used in this study was that personal growth and development could be observed in the reflective accounts over time as opposed to the one-off questionnaire-type data collected in the quantitative studies reviewed above. This

richness in data is also reflected in a British qualitative study (Spalding, 2000). The professional development of two newly qualified occupational therapists was explored over a period of one year. The findings of unstructured interviews were matched to a well-established model of skill acquisition (Dreyfus & Dreyfus, 1980). Results indicated that the graduates developed over the period of 12 months, and showed proficiency in some of the early skill areas of the model. This 12-month period of acclimatisation is suggested by Waters (2001) as a period of internship for newly qualified occupational therapists in the UK.

These qualitative studies have highlighted the importance of using a longitudinal approach in studying the transition process, but, to gain true representation, a larger number of subjects would be needed. Sutton & Griffin (2000) have endeavoured to achieve this aim by investigating student expectations and then their subsequent experiences of entering practice. To date, the initial findings of the study report that the 295 final-year students aged between 20 and 23 hold what the authors perceive as inflated expectations of their first jobs. They expect regular supervision, respect from their peers, good working relationships, and to feel competent in practice. The second phase of the study will explore the realities of practice as a qualified practitioner. From the evidence in the literature cited above, it could be projected that new graduates will feel competent in the execution of frequently used assessment and treatment techniques, but feel less competent with atypical situations. They may well experience problems with collaborative working and have communication difficulties with members of other professional groups. The burden of decision making and the level of responsibility may cause stress for some, which, coupled with poor self-management skills, may result in low levels of confidence. On a more positive note, the evidence, both from the UK and internationally, does indicate that recent occupational therapy graduates feel highly skilled in seeking out new information, and are comfortable to take responsibility for their own learning and professional development. They relate well with clients and can provide effective occupational therapy intervention that, with experience, will develop into skilled and competent professional performance. The literature associated with early professional performance raises many issues around the transition to the work role and puts the onus on universities to prepare graduates for the realities of the workplace. The graduate's perceived lack of skills might be due to a lack of confidence expressed as anxiety when confronted with the responsibility of decision making and the

professional autonomy expected of the title state registered practitioner (Parker, 1991; Kenyon & Ilott, 1997).

The findings of the occupational therapy literature cited above are also echoed in the medical, nursing and midwifery literature. New graduates in these professions also felt that they lacked confidence initially and expressed difficulty in making decisions and showing leadership but, with time, these deficits were less prevalent (Bartlett et al., 2000; Clack, 1994; Fraser, Murphy & Worth Butler, 1997). None of these studies in the occupational therapy and nursing literature looked at age-related issues in making the transition from student to qualified practitioner.

EMPLOYER PERCEPTIONS OF NEW GRADUATES IN PRACTICE

Canvassing the views of new graduates in practice provides a very one-sided, albeit highly relevant perspectives on entering practice as a new graduate. The literature indicates that poor levels of self-confidence are experienced by new graduates, which might lead to an underestimation of their true performance (Allen & Cruickshank, 1977; Atkinson & Steward, 1997; Rugg, 1996; Tryssenaar, 1999) or, more dangerously, an overconfident and thus 'unconsciously incompetent practitioner' (Carlisle, 2000, p. 886). To counteract these misconceptions in ability, Hummell and Koelmeyer (1999), along with Atkinson and Steward (1997), recommended that the perceptions of employers or supervisors form part of any research that investigates new healthcare practitioners in practice.

A small number of occupational therapy studies have canvassed employer opinions in investigating whether new graduates were fit for purpose on entry to practice. Kenyon and Ilott (1997) as cited earlier, surveyed funding authorities and line managers using a questionnaire. Their study found that in-service graduates were perceived to be competent practitioners, adapting well to the workplace and showing confidence in practice. Although in-service graduates were resourceful and assertive, they were seen to have lower analytical skills and present with lower standards of written work than graduates of full-time courses. This study provided a rich insight into the competence of new graduates from one type of programme but was limited in scope, having a sample of 23 line managers and graduates of only one occupational therapy educational

institution. Huebler (1994) interviewed a range of employers of new healthcare graduates across the US and found that they were dissatisfied with the levels of practical clinical skills and interdisciplinary working skills shown by newly qualified allied health professionals. The study urged closer liaison between universities and the healthcare employment sector to redress these problems. Adamson, Harris & Hunt (1997) shared this view and saw interdisciplinary education as resolving deficits in collaborative working on graduation. The Department of Health commissioned study, also cited earlier, found that although employers and supervisors perceived the newly qualified therapists to be lacking in hands-on practical skills, they were satisfied with the levels of competence shown by new graduates (Barnitt & Salmond, 2000).

The nursing literature provides evidence of a long history of employer involvement in assessing the competency of newly qualified nurses (McCloskey, 1983; Schwirian, 1978). Ryan and Hodson (1992) saw employer feedback as an essential element of programme evaluation. In this study the terminal objectives or learning outcomes of the nursing programmes were also used to design a competency measure. Although US-based and focused on nurse education, the findings are surprisingly similar to British studies of occupational therapy new graduates in practice. Ryan and Hodson found that recently qualified nurses lacked confidence and leadership skills, as well as deficits in clinical nursing skills but had a positive attitude, a strong knowledge base and showed professionalism in the workplace. Poor leadership skills were also found when Bartlett et al. (2000) sought the opinion of mentors or work supervisors in a study that compared nurses who qualified from two different levels of nurse education programmes in the UK.

SUMMARY OF THE CHAPTER

This chapter was divided into three discrete sections, each addressing a separate theme relevant to an investigation of the performance of mature students in education and practice settings. As the profession of occupational therapy is relatively small, literature from across the globe was included in this review. However, significant differences in the age-range of students on occupational therapy programmes has limited the transferability of the Australian and North American literature to the UK context.

Within the general education literature, mature students were seen to be a highly motivated sub-group of the student body and it would seem that dividing the mature student group into discrete age bands did not add any additional evidence to the debate. There was consensus in the literature about the academic superiority or at least equivalency of mature students over younger students. Other factors in the literature influenced levels of academic performance. Entry qualifications were seen to play an important role in academic performance at university. Close inspection of the research evidence showed mature female students outperforming male students. Subject differences were also noted, with mature students consistently performing less well in subjects relating to engineering and technology, but outperforming their younger peers in social sciences and vocational subjects.

There was a significant lack of published studies investigating the impact of age on academic performance in health-related education. This literature was reviewed for a number of entry variables and although age was included in only a small number of studies, it was not seen to be as strong a predictor of academic performance as was seen in the general education literature.

The issue of competence was discussed, as this concept relates directly to any investigation into early threshold levels of ability in the clinical workplace. The chapter explored definitions of competence and saw how the more dated literature had descriptions that were behavioural in approach. However, definitions have become more integrated over time, encompassing the less observable traits of critical thinking, attitudes and values of a professional group. The literature showed how the expert panel was by far the most common way to develop a framework or standards of competency in professional groups. Global rating scales were explored in some depth, as this approach emerged from the literature as one of the more time-efficient tools by which

the ongoing real-life abilities of a healthcare professional could be assessed in the clinical setting.

The search strategy used to inform this review gave rise to a number of quantitative and qualitative studies that explored the link between university and world of work, both from the new graduates' perspective and, to a lesser extent, the employers' perspective. Common findings were feelings of low confidence on entering practice, coupled with an anxiety about taking responsibility. Although no studies differentiated for age, the literature did address different routes to qualification, finding differences between the three-year full-time graduate and the in-service graduate. The in-service graduate showed more confidence but also found decision making difficult initially. As these students were by definition older, this offers some insight into the possible benefits of previous work experience in the mature student group. However, the in-service students' experience is directly related to occupational therapy, and it cannot be assumed that more general work experience of other mature students would have the same impact on standards of professional practice after graduation. The review finds a dearth of research that canvasses the employer perspective or that investigates other factors, such as age, which may impact on this transition into practice for the recently qualified occupational therapist. Furthermore, no studies were found that looked at the performance of occupational therapists after graduation and related it back to their performance in university or the degree classification achieved. The following chapter outlines original research that serves to fill these identified gaps in the research.

CHAPTER 3 RESEARCH METHOD

The chapter begins by describing the background to the chosen research design. The choice of design is then defended against alternative paradigms of research. The research methods selected to collect the data are presented in diagrammatic form in Figure 1. Each aspect of the overall design is then discussed in detail in the subsequent text. The chapter also considers the ethical issues arising from the research proposed and discusses how they were addressed and approved by both an internal university ethical approval committee and an external NHS ethical approval committee.

BACKGROUND TO THE RESEARCH DESIGN

The general body of education literature reviewed in the previous chapter found evidence that age was a factor in the academic performance of mature students in higher education. In the more specialised healthcare literature however, entry qualifications were seen to play the predominant role in predicting academic performance. Few healthcare studies included age in their analysis. This study proposed in this chapter will investigate whether the age-related success found in the general body of education literature is mirrored in healthcare education by exploring the impact of age on academic performance at the point of exit from occupational therapy programmes. It aims to answer the first research question of the study;

1. Do mature students in occupational therapy programmes across England and Wales perform better academically than younger students at the point of exit from the programme?

The literature review also sought to explore perceptions of competence in the first year of healthcare practice but the research evidence showed a notable lack of studies that canvassed the employer perspective on the levels of competence demonstrated by new graduates in practice. Furthermore, no studies were found that looked at the performance of occupational therapists after graduation and related it back to their academic performance at university or the degree classification achieved. This chapter outlines a study that serves to fill these identified gaps in the research and answer the final two research questions of the study.

2. Do employers perceive a difference between mature and young graduates, as measured by an occupational therapy graduate competency rating scale?

3. Does the age of the graduate have an impact on their perceived level of professional competence, as measured by the graduate competency scale?

JUSTIFICATION OF CHOSEN METHODOLOGY

The research questions arise from a measurement paradigm of research and thereby use constructs such as academic performance and competence that are measurable concepts, albeit using different theoretical approaches. The literature review showed, how in North American universities, the GPA is a universally accepted measure of academic performance but in the UK, the final degree classification, which is calculated from a similar academic average is used. Both of these measures of academic averages used norm-referenced measurement approaches to differentiate one graduate from another. However, the literature suggested a criterion-based approach for the assessment of competence. The professional judgement of supervisors, using global rating scales, was identified in the literature review as an effective measurement tool to capture the wide range of knowledge, skills, critical thinking, attitudes and values of a professional working in healthcare setting.

This study used a global rating scale of integrated competence to measure levels of competence in new graduates. A global rating scale, using systematic observation, can be used for the purpose of making a decision about the individual's performance against a pre-determined set of standards. This criterion approach to measurement relies on the judgement of the skilled assessor to measure competence (Ashworth & Saxton, 1992). The assumption underpinning the research questions is the belief that age, with its associated life and work experience, might be a predictor of success in the academic outcome and early professional performance of graduates from occupational therapy programmes. The research hypotheses are thus based on a nomothetic approach to science, which looks for general laws or principles that can predict behaviour, rather than an idiographic approach, which seeks to understand the phenomena from the unique perspective of an individual (Stein & Cutler, 2000). Consequently, the measurement focus of the study has guided the research methodology, where quantitative methods are best suited to a nomothetic approach and qualitative methods to an idiographic approach. As discussed above, this study seeks to predict outcomes from constructs that are quantifiable and measurable. Academic performance can be measured by the final degree academic average and competence measured by ratings on

a global rating scale of competence. The decision over which research method to use was determined by the nature of the data collected and therefore a qualitative or case based approach would not fully serve the nomothetic needs of the study. Gitlin, Seagal and Boru (1993) summarise the debate over the choice of research methods by saying 'if the educational problem is such that a qualitative approach gives the best data, use a qualitative approach; if the problem is such that a quantitative approach gives better data, use that approach' (p.205). Meanwhile, De Poy and Gitlin (1994) also highlight the importance of the position of the researcher in the choice of research method by acknowledging the impact of the researcher's preferred way of knowing on the chosen method. This study thus concedes to the researcher's preference for quantitative methods, which has influenced the formulation of the research questions and the concepts of measurement therein. The study presented in the remaining part of this chapter is predominately nomothetic and quantitative in approach. But the subjective opinion of the participants is acknowledged by asking employers and graduates to provide comments in an open free-text box at the end of the competency questionnaires. This narrative-type data provides an opportunity for triangulation and an insight into the respondents' personal views on the professional competence of new graduates in practice.

RESEARCH PROCESS

The research design of this study used a survey approach to collect descriptive information from a sample of the population under investigation. This descriptive information was used to make comparison between subsets of the sample and draw inferences about the relationships existing within the characteristics of the population. The study was non-experimental in design, as the researcher did not manipulate the data and all of the events had occurred prior to the point of data collection. Figure 1 on the next page highlights the essential aspects of the research study presented in this thesis. The corresponding text in the remainder of the chapter will then guide the reader through the research methods using the research design diagram.

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RESEARCH AIM

The study aimed to investigate if age is a predictor of success in the academic outcome and early professional performance of recent occupational therapy graduates. The study therefore addressed two separate aspects of graduate ability; academic performance and performance in the workplace. Part 1 of the study collected data on academic performance from occupational therapy educational programmes across England and Wales. Part 2 used a graduate competency global rating scale as part of a questionnaire sent to a sample of head occupational therapists in Southern England. Both parts of the study were carried out simultaneously in May and June 2000.

RESEARCH DESIGN

A survey approach was considered the most suitable method to answer the research questions outlined above, as this design lends itself to collecting data that may be associated but not have a cause-effect relationship. Thus, the independent variables such as age, type of occupational therapy degree are not experimentally induced but pre-existed for the subjects under investigation. The purpose of the study was to compare the existing relationship between these variables and the dependent variables of academic performance and competence by measuring differences within age groups by statistical tests. The data were collected using a postal-survey approach as this permitted access to a geographically wide population. The survey tools were self-administered questionnaires, thus ensuring consistency of approach to all respondents irrespective of location.

PARTICIPANTS

The study collected data from a number of sources thus providing a method of triangulating the findings to provide a more valid perspective on the phenomena of graduate ability in occupational therapy. Part 1 of the study collected data on the academic performance of graduates of the year 1999 from occupational therapy schools across England and Wales. Part 2 of the study collected data on perceived levels of professional competence from employers of recent occupational therapy graduates in Southern England and also from the new graduates directly. The sampling procedures for each part of the study differ and are therefore discussed separately.

Part 1 – Postal survey to occupational therapy schools

To investigate academic performance, the total population of 19 occupational therapy schools that offer a full time degree in occupational therapy in England and Wales were invited to participate in the research study. Schools in Scotland and Northern Ireland were excluded, as their undergraduate programmes are four years in length and thus their graduates would, by definition, be older on graduation from their programmes of study than those completing three-year degrees. Graduates in the Scottish schools also have the option to qualify with state registration but without an honours degree after the third year. This fact would have introduced another confounding variable into the analysis of academic outcome. Also excluded from the study were the 4 occupational therapy schools that offer a two-year accelerated occupational therapy postgraduate diploma programme for mature graduates only.

An estimated 1300 occupational therapists graduate in the UK each year (COT 2001a). However, for a statistically robust sample of this population, the level of significance, the power and effect size must be pre-determined at the onset of the study. The statistical level of significance is the probability of rejecting a true null hypothesis (Type I error) referred to as alpha and was set at the 0.05 level (α), as is usual for studies of this nature (Munro, 1997). Power is the likelihood of rejecting the null hypothesis (avoiding a Type II error) where an 80% level is acceptable (β). The effect size cannot be foreseen at the onset of a study and is usually projected in advance from previous research. In this study, the effect size was estimated from a pilot study that measured the statistical difference in academic averages between mature and younger occupational therapy graduates in nine year-cohorts of data from Oxford Brookes University. These values were extrapolated into the present study to calculate the expected effect size, which together with the power and level of significance were entered into a sample size estimation formula (Bourke, Daly & McGilvray, 1985). This calculation estimated that a sample size of at least 170 mature subjects and 170 younger subjects was required. Part 1 therefore, needed to recruit 340 subjects overall for the study to be statistically robust.

Part 2 - Postal survey to clinical occupational therapy departments

The sample size for the second part of this study was not easy to estimate in advance because a previous pilot study had used a different rating scale to measure competence. It is difficult, therefore, to calculate a meaningful effect size from this small pilot study

to apply to the current study. Nevertheless, the significance level was set at 0.05 at the onset of research and it was hoped to obtain as large a sample as possible to avoid making a Type II error.

Part 2 of the study was targeted at clinical occupational therapy departments located within NHS hospital and community trusts located in regional boundaries four NHS Regional Health Authorities in Southern England. This geographical region includes four out of the nine NHS Regional Health Authorities listed in Binley's Directory of NHS Management (NHS Confederation, 2000). These four NHS regions were selected as the non-probability sample for the study because their hospital and community trusts they have a direct relationship for fieldwork placements with the researcher's host university. The strength of the relationship between the University and these NHS Trusts was also seen as an important factor in enhancing the response rate of this survey. Therefore, all 190 NHS hospital and community trusts located in the four NHS regions were selected for the sample, this included;

- ❖ 36 NHS Trusts in the Eastern NHS Region
- ❖ 33 NHS Trusts in South West NHS Region
- ❖ 62 NHS Trusts in the South East NHS Region
- ❖ 59 NHS Trust in the London NHS Region

Each of the 190 NHS hospital and community trusts within the geographical boundaries of the four regional confederations were sent a questionnaire pack that include one copy of the graduate and employer questionnaire. One hundred larger hospital trusts were sent duplicate copies of the questionnaires because these larger trusts they were likely to have employed more than one recent occupational therapy graduate. A total number of 580 questionnaires were posted in May 2000, this included 290 graduate questionnaires and 290 employer questionnaires.

Stein and Cutler (2000) predict a response rate in the region of 30 to 40% for postal surveys in general, therefore, it could be estimated that the sample for this study would be expected to produce at least 100 questionnaires returned from employers and 100 from graduates themselves. All employer respondents were instructed in the covering letter to return the pack even if there were no recent graduates working in the occupational therapy department.

DATA COLLECTION PROCEDURES

A postal survey approach was used to implement Part 1 and Part 2 of this research study. The different procedures of distribution and reminders are outlined for each part of the study separately.

Part 1- Postal survey to occupational therapy schools

The questionnaire to schools was addressed to the director of the occupational therapy programme in each school according to a list provided by the validations officer at the College of Occupational Therapists in London. Each school was requested to provide anonymous data on the graduating class of 1999. Directors of schools were informed that their consent to participate in the study was inferred by the school's completion of the questionnaire. This data collection procedure was totally anonymous, and was approved by ethical review committees as meeting the requirements of the Data Protection Act 1998. A reminder letter was sent six weeks after the initial mailing to all schools in the sample. See Appendix 1 for a copy of the questionnaire to occupational therapy schools and relevant letters.

Part 2 –Postal survey to clinical occupational therapy departments

Each of the clinical occupational therapy departments in the sample were sent an envelope that included a covering letter and one or more copies of an employer questionnaire, stamped addressed envelope and one or more sealed envelopes labelled 'graduate questionnaire'. The covering letter instructed the occupational therapy managers to complete the employer questionnaire by providing anonymous demographic data and rating the competence of any recent graduate(s) working in the department. They were provided with a stamped addressed envelope to return their questionnaire. The covering letter requested that employers distribute the envelope(s) labelled 'graduate questionnaire' to any recent graduates in the department. Employers were also informed that the graduate would be returning their questionnaire independently to the researcher. See Appendix 2 for a copy of the questionnaire to employers in clinical occupational therapy departments and the covering letter.

The 'graduate questionnaire' envelope included its own covering letter addressed to the recent occupational therapy graduate, along with a self-rating competency questionnaire and a stamped addressed envelope. Graduates were asked to identify their age at the start of their occupational therapy education, their final degree title and level of award plus the year of graduation - no names were requested. Graduates were then instructed to rate their level of skill in relation to each of the items on the final pages of the questionnaire. See Appendix 3 for a copy of the questionnaire to new graduates and relevant covering letter.

Graduates and employers were informed in the covering letter that their consent to participate in the study was inferred by their completion and return of the questionnaire. The questionnaires were not coded thus ensuring total anonymity in the survey. However, this meant that the researcher was unaware of who had or had not responded to the survey hence no follow-up or reminder letters were sent for this part of the study. It is important to note that the employer and recent graduate questionnaires were not matched as both were returned independently of each other in separate stamped addressed envelopes. This procedure ensured total impartiality and independence in the ratings provided by both groups.

DESIGN OF THE APPARATUS

The data collection tools used in this study were postal questionnaires so the general principles of questionnaire design were adhered to in their design (Oppenheim, 1992).

General principles of questionnaire design

All questionnaires were printed on white paper and by way of contrast, the covering letters were printed on the buff, headed notepaper of the University. All questionnaires included clear instructions on how to complete the questionnaire. The questionnaires used closed fixed response type questions that enabled numerical coding and efficient data entry for statistical analysis. A free-text box was available at the end of the competency questionnaires to enable respondents to make comments. Both questionnaires were piloted and this important stage of the research process will be discussed for both parts of the study separately.

Part 1- Pilot phase and the definitive questionnaire to occupational therapy schools

The format of this questionnaire to occupational therapy schools was piloted in 1995 as part of a study relating to the academic performance of seven cohorts of occupational therapy students of Oxford Brookes University. This study was submitted as the assessed component of a double module on the Doctorate in Education (EdD) and served as a pilot of both the variables and some of the analysis procedures for this larger national study of academic performance of occupational therapy students (Shanahan, 1995). No changes were made to the questionnaire for the current study.

The 19 directors of the selected occupational therapy schools were sent a questionnaire asking them to provide anonymous data on the graduating cohort of 1999. For each unnamed graduate, the questionnaire requested data on the age at entry, entry qualifications and the numerical average used to calculate the final degree classification. A column was reserved for additional comments on each graduate, which could be used to indicate a delayed qualification or other such remarks. The questionnaire also asked schools to provide general information relating to the entry qualifications for the year of entry -1996; the title of the academic award, e.g., BSc (Hons). The questionnaire also asked if the fieldwork component was included in the final average and if so, its percentage weighting.

Part 2 – Pilot phase and the definitive competency questionnaires.

The design of the competency questionnaires for this current study was also informed by a pilot study carried out in 1995 as part of Oxford Brookes University funded project to examine learning outcomes in higher education (Shanahan, 1996). The rating scale was derived from the 20 competencies listed the 1993 version of the curriculum framework for occupational therapy (COT, 1993). The researcher was responsible for the general layout, scaling and format of the questions. The pilot questionnaire was administered to 87 newly graduated occupational therapy students from Oxford Brookes University. The level of competence was determined using a four-point Likert scale based on the principle of measuring the levels of guidance required in the first year of professional practice. Respondents were asked to rate the level of guidance they required to meet the 20 identified competencies on a four-point scale ranging from 'little or no guidance' through to 'total guidance'. The responses were added together and a summed rating of overall competence was thus extrapolated from the levels of

guidance. Results of this pilot study were presented at an international occupational therapy conference in Madrid (Shanahan, 1996).

The College of Occupational Therapists launched a new and expanded curriculum framework for occupational therapy document in 1998 outlining 46 core-skills, behaviours and abilities required of a graduating occupational therapy student to be eligible for state registration as an occupational therapist in the UK (COT, 1998). This latest version of the curriculum framework informed the content of the competency questionnaire used in the current study. The scaling procedures were modified to ease completion of the questionnaires and facilitate clearer interpretation of the findings. However, the principle that competence is a concept that can be measured was retained, so that a resultant score on the measure or sub-scales could distinguish between individuals for the construct of professional competence.

The final questionnaires to clinical occupational therapy departments comprised of an employer questionnaire and a graduate questionnaire. The format of both questionnaires were alike, with demographic questions on the first page followed by a global rating scale of professional competency. Employers were asked to rate the ability of the new graduate in relation to each of the 46 positively worded competency statements using a four-point rating scale. The polar ends of this Likert scale were worded as 'strongly agree' and 'strongly disagree'. There was also provision to tick a box saying that a skill was not applicable in that clinical setting. The graduate questionnaire differed only in its grammatical focus. The questions on the questionnaire were reworded in order that the 46 competency statements related to 'self' and the Likert scale could thus be used as a self-reporting competency measure. All statements now began with 'I'. Both questionnaires were four pages long and included a free text box where respondents were invited to make comments in relation to professional competency and new graduate ability. Instructions for date of return and a thank-you comment were used to close the questionnaires. See Appendix 2 and 3 for a copy of these questionnaires.

Reliability and validity issues in the design of new measurement tools

Kirshner and Guyatt (1985) suggested that item selection is an important stage in the development of any new discriminative measure. They suggest the inclusion of items that have relative stability over time and are not just current trends or fads in practice.

The items should also be universally acceptable in professional practice and not represent one specialist area. The curriculum framework for occupational therapy was developed using expert opinion and documentary analysis (COT, 1998). Although no formal testing of content validity was carried out on the document it did provide the only national perspective on the expected standards and outcomes of British occupational therapy education at the time of this study. As such, its use as a baseline measure from which to devise a rating scale of competence in the year 2000 is justified. The QAA subject-benchmarking statements for occupational therapy were not available until 2001 (QAA, 2001).

When scaling a discriminative measure, Kirshner and Guyatt (1985) also suggest that item responses be scaled in a manner that can discriminate effectively between different levels of ability. When designing the competence measure for this study the two-point categorical scale of 'competent' versus 'not competent' was an attractive consideration, but greater sensitivity is achieved with a wider scale. However, Steiner and Norman (1995) advise a maximum of seven categories. A more important consideration is the descriptors used to label the scale. The respondent should be provided with clear labelling for each end-point on the scale and be facilitated to make prompt decisions without the potential for ambiguity. For this reason, the more traditional 'strongly agree' to 'strongly disagree' statements were used in the competency questionnaires in order that the Likert scale would provide a more direct measure of competence than used in the pilot questionnaire.

ANALYSIS

The methodological paradigm underpinning this research study was primarily quantitative, therefore the data were collected from closed, fixed-response type questions that enabled numerical coding and data entry on SPSS for two-tailed statistical analysis using a 5% level of probability (α) and a power of 80% (β). The strength of association between the independent and dependent variables are presented as Eta Squared indices of effect size ($\eta^2 =$) (Green, Salkind & Akey, 2000). The conventional values of $\eta^2 = 0.01, 0.06,$ and 0.14 represent small, medium and large effect sizes respectively. The comments provided at the end of the competency questionnaires were coded into themes and analysed manually using content analysis to

highlight the frequency and magnitude of opinion within and across each of the emergent themes (Robson, 1994).

Part 1- Questionnaires to occupational therapy schools

Data from the questionnaire to occupational therapy schools were analysed initially with descriptive statistics, followed by inferential statistics so that differences in the dependent variables of academic average and degree classifications could be determined on the basis of the independent variable of age. Hypothesis testing of the first research question was facilitated by the use of t-tests. The impact of potential confounding variables, such as modes of study and entry qualifications, were also examined with statistical techniques.

Part 2- Questionnaires to clinical occupational therapy departments

Data from the competency questionnaire were subjected to factor analysis, a statistical technique that explains the variation and relationship amongst items in the questionnaires to underlying factors or sub-constructs of competence. Factor analysis thereby reduced the data into discrete sub-scales of competency, which in turn became the dependent variables for subsequent inferential analysis and hypothesis testing. The potential confounding variables; such as type of degree, level of award and year of qualification were then considered in the analysis.

Tests for homogeneity and discriminant validity were carried out on the recommendation of Kirshner and Guyatt (1985) who suggest that any new discriminative measure or scale be statistically tested for internal consistency and reliability in order to determine if the sub-scales truly measure different aspects of the same overall construct. The uniqueness of each of the sub-constructs of competence was also assessed to determine the discriminant validity of the scale.

RESEARCH APPROVAL PROCESS

A research proposal outlining the study was submitted to the Professional Doctorates Sub-Board of the Research Degrees Board of Oxford Brookes University in December 1999 and the study was successfully ratified to proceed by this committee on January 10th 2000.

ETHICAL APPROVAL PROCESS

Applications for the ethical approval of the research study were made to the ethics committee at the School of Health Care and to the Oxford Radcliffe NHS Trust 'Applied and Qualitative Research Ethics Committee' (AQREC) on February 2nd 2000. The latter was a necessary component of the study because ethical approval is required for primary research involving patients or employees in the NHS. The Ethical Committee Research Application Form forwarded to AQREC outlined that participation of occupational therapists in the study was entirely voluntary, that all data collected would be handled and stored in a confidential manner and that all procedures complied with the Data Protection Act 1998.

The key ethical issue that arose from this research design was the need for absolute anonymity in the competency data collected from the employer and graduates. It was therefore seen as essential to the research design that the employer responses could in no way be matched to those of their employees; the new graduates. For this reason, all graduates were provided with a stamped addressed envelope by which to return their questionnaire independently of their employer. There was also a statement included on each questionnaire that the competency measures should be used for research purposes only. This caveat was inserted to remind employers that the tool should not be used for appraisal or staff development purposes. The cohort data from occupational therapy schools collected in Part 1 of the study was also collected with full anonymity. Professional indemnity for the study was provided from Oxford Brookes University. Confirmation of ethical approval was provided in writing to the researcher in April 2000. See Appendix 4.

SUMMARY OF THE CHAPTER

This chapter presented and defended the quantitative research design selected for the study. The research design flow diagram illustrated the survey methodology from the initial selection of participants, the design of the questionnaires, the procedures for data collection and finally the process of data analysis. Each stage of the research design was explained in the text and justified in the context of Kirshner and Guyatt's (1985) recommendations for the design of new measures that serve to discriminate between individuals. The chapter concluded with a summary of the ethical approval processes

undertaken prior to data collection. The results of study are presented in the next chapter.

CHAPTER 4 RESULTS

This chapter will examine, analyse and interpret the data collected as part of this research study. It begins by presenting the data collected from occupational therapy schools located at universities across England and Wales (Part 1). The remainder of the chapter is devoted to the data collected via the competency questionnaires mailed to recent graduates and occupational therapy employers (Part 2). This includes the analysis of the quantitative data, as well as the thematic content analysis of the comments provided at the end of the competency questionnaires. The chapter concludes with a summary of the important findings of the research.

PART 1 - DATA FROM OCCUPATIONAL THERAPY SCHOOLS

Nineteen Occupational therapy programmes in England and Wales, including the host institution of the researcher, were sent questionnaires in April 2000 to explore if mature students in occupational therapy programmes across the UK performed better academically than their younger peers at the point of exit from the programme.

Each university was asked to provide anonymous data on the graduating class of 1999. General questions were asked pertaining to the level of entry qualifications required for entry onto the occupational therapy programme and the percentage contribution of fieldwork to the final average were requested. For each unnamed graduate, the age at entry, type of entry qualifications, final numerical academic average and degree classification was entered on the questionnaire.

Twelve schools responded to the postal survey, but only eight were able to provide a complete set of data as requested. Each school that provided usable data was assigned a coded identification number. Seven universities did not respond despite a reminder letter sent out six weeks after the original mailing. Therefore, the overall response rate was 63%, with a usable response rate of 42%. The responses from the eight

occupational therapy schools generated a data set of 425 subjects, which was above the minimum sample size of 340 subjects estimated for a robust study sample.

Descriptive data

The data on the 425 subjects were coded and entered into a SPSS database for statistical analysis. Descriptive analysis of the whole data set, irrespective of age at this point, yielded the following information. Seven universities offered a Bachelor of Science in Occupational Therapy with Honours (BSc. Hons), one offered a Bachelor of Health Science Honours Degree in Occupational Therapy. The inclusion or exclusion of the fieldwork practical component, and its percentage weighting in the final academic average differed across the 8 universities. Three universities indicated that fieldwork did not contribute to the overall academic average or degree classification. Of the remaining five universities, the percentage contribution of fieldwork ranged from 14% to 40%, with three universities stating a fieldwork contribution of 25%. See Table 2.

The questionnaire asked universities to provide the final academic average for each listed graduate. It was recognised that each university would differ in how this final average was calculated (Westcott & Rugg, 2001). Nevertheless, all universities used some form of final academic average to determine the final degree classification of the graduate. This is usually an average of results obtained in examinations, coursework and other projects undertaken during the latter stages of a degree.

The numerical academic average of each graduate within a university was used to calculate a university academic mean and standard deviation. These data, plus the percentage contribution of fieldwork to that average within each university, are presented in Table 2.

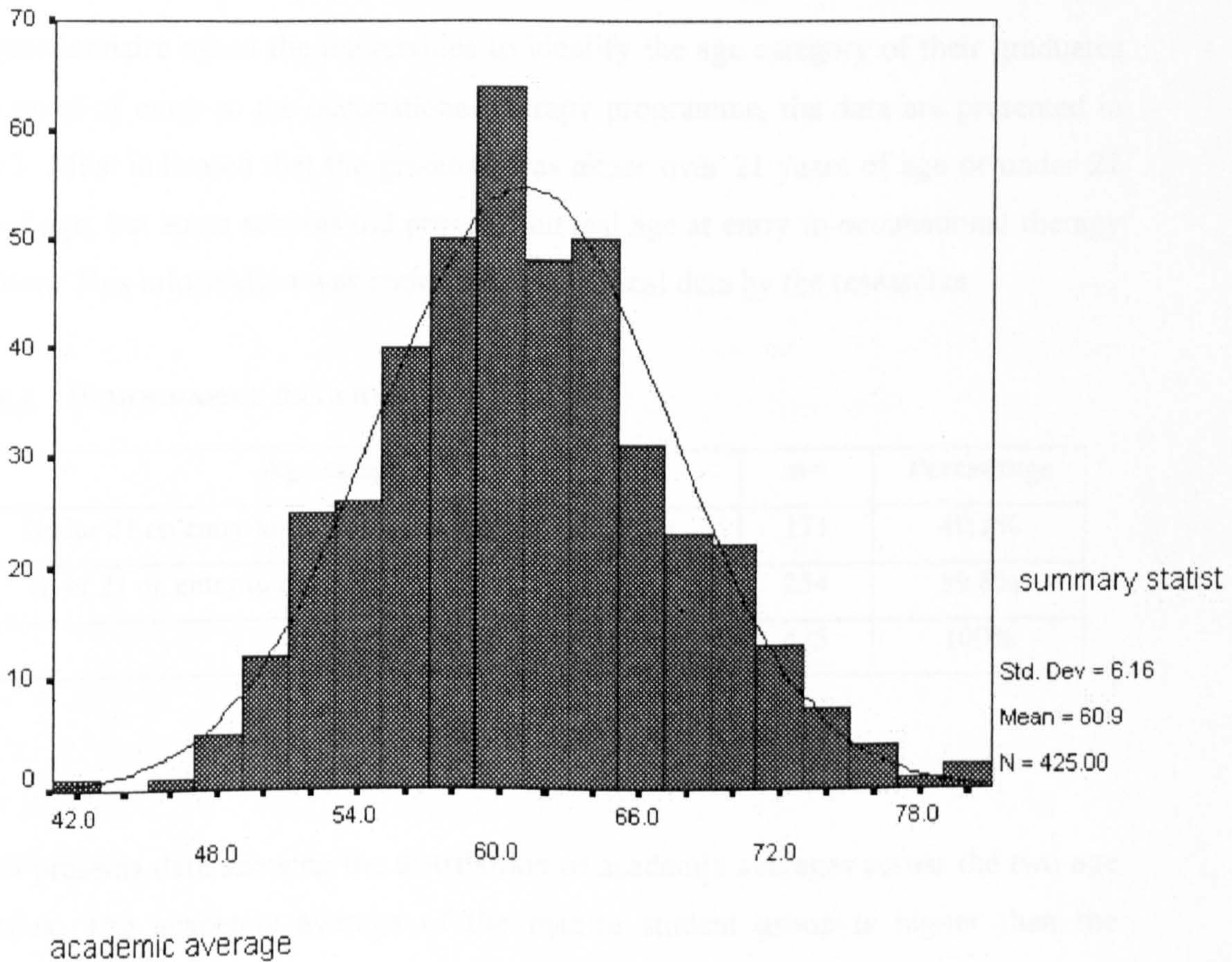
TABLE 2. MEAN, STANDARD DEVIATION AND PERCENTAGE CONTRIBUTION OF FIELDWORK ACROSS UNIVERSITIES.

School ID. No.	Number of graduates in 1999	Mean academic average across the graduating cohort	Standard deviation	Percentage contribution of fieldwork to academic average
1.	70	60.21	4.53	25%
2.	73	61.48	6.19	20%
3.	30	58.10	4.59	0%
4.	87	57.43	5.62	0%
5.	32	64.14	5.69	26%
6.	24	62.50	5.21	14%
7.	81	63.68	6.65	0%
8.	28	62.46	6.00	40%
Total	425	60.94	6.16	-

In order to carry out analysis of the data set as a whole it was important to see if there were any statistical differences in the mean academic averages of students across the eight schools. A one-way analysis of variance (ANOVA) was conducted to evaluate the hypothesis that the data are derived from the same reference population. Results show that the F value is significant, $F(7, 417) = 10.617, p < 0.05, \eta^2 = 0.15$ indicating a statistically significant difference with a large strength of association between the mean academic averages across the universities. However, to rule out the likelihood of making a Type I error, a post-hoc multiple comparison test analysed the pairwise differences between universities on a case-by-case basis. This Scheffe procedure showed that only 8 out of 28 pairwise analyses were in fact statistically significant. For this reason the data were aggregated for subsequent inferential analysis. Furthermore, the data were collected from schools that used similar entry criteria to screen applicants for entry on to their occupational therapy programmes in the year 1996. The academic averages were analysed for normality and homogeneity of variance to justify the correct use of parametric data analysis techniques. Figure 2 below indicates that the data are normally distributed and Levene's test shows homogeneity of variance across the universities (Levene statistic $(7, 417) = 1.948, p > 0.05$). The data thus satisfied the conditions associated with the use of parametric statistics for age-related analysis of the data.

FIGURE 2. NORMAL PROBABILITY PLOT OF ACADEMIC AVERAGES ACROSS UNIVERSITIES

normal probability plot of academic average across universities



Age and academic average

In order to answer the first research question of the study, the data were separated into discrete age groups based on the age of the student when they began occupational therapy education. The data were then statistically analysed for the effect of age on the final academic average.

1. Do mature students in occupational therapy programmes across England and Wales perform better academically than younger students at the point of exit from the programme?

Results of hypothesis testing are presented and interpreted within a discrete text box throughout this Results chapter. This will enable the reader to clearly see the inferences drawn from these tests in comparison to the descriptive analysis of the data presented.

The questionnaire asked the universities to identify the age category of their graduates at the point of entry to the occupational therapy programme, the data are presented in Table 3. Most indicated that the graduate was either over 21 years of age or under 21 years of age, but some schools did provide the real age at entry to occupational therapy education. This information was coded into categorical data by the researcher.

TABLE 3. DEMOGRAPHIC DATA BY AGE CATEGORY

Age category	n=	Percentage
Under 21 on entry to occupational therapy education	171	40.2%
Over 21 on entry to occupational therapy education	254	59.8%
Total	425	100%

Table 4 presents data showing the distribution of academic averages across the two age categories. The academic average of the mature student group is higher than the younger student group. The distribution of averages for the mature students is also more widely dispersed which is reflected in the larger standard deviation.

TABLE 4. MEANS AND STANDARD DEVIATION OF ACADEMIC AVERAGE BY AGE CATEGORY

Age category	Mean	Standard deviation
Under 21 (171)	59.79	4.89
Over 21 (254)	61.72	6.78
Total (425)	60.94	6.16

Hypothesis Testing Box 1

A t-test was carried out to test the null hypothesis that there was no difference in the academic average of graduates between the two age categories. The data were analysed using a t-test and the results show that mature students have a higher final academic average than the young students, ($t(420) = 3.396, p < 0.001, \eta^2 = 0.024$).

Interpretation of result

The test shows a statistically significant difference in the academic averages between the two age groups. The null hypothesis was rejected but the small effect size does indicate a low strength of association between age and academic average.

This statistical significant difference in age groups can also be seen more clearly when looking at how the degree classifications have been awarded by age category. The final academic average was used to determine the degree classifications in line with the well-recognised national taxonomy of degree awards within universities. Table 5 shows that mature graduates were more likely to be awarded a higher degree classification than their younger peers. Chi squared analysis of the data showed a significant association between age group and degree classification ($\chi^2(3) = 29.24, p < 0.01$, Cramer's V measure of effect size = 0.262). The Cramer's V statistic of 0.26 indicated the strength of a moderate association between degree classification and age. However, in order that the assumptions of the Chi-Squared analysis were met, the two graduates in the ordinary-degree category were removed from the statistical analysis so that no more than two cells had less than five participants (< 20% of the total number of cells). Table 5 also shows interesting percentage variations across the mature and younger age groups. Mature entrants were more likely to qualify with an upper second class honours degree whereas the under 21-year-old had a fairly equal chance of gaining either an upper-second or lower-second class honours degree.

TABLE 5. DEGREE CLASSIFICATION AND AGE CATEGORY

Degree classification	Entrants under 21 years		Entrants over 21 years	
	Number	Percentage	Number	Percentage
1 st	4	2.3%	39	15.3%
2:1	85	49.4%	132	51.8%
2:2	81	47.1%	75	29.4%
3 rd	1	0.6%	8	3.1%
Ordinary degree	1	0.6%	1	0.4%

Entry qualifications and the academic average

As evidenced by the literature supporting this study, any analysis of academic attainment in higher education must also look at the effect that entry qualifications might have on academic attainment. As the study asked universities to identify the nature of the entry qualification for each graduate, it was now possible to divide the data set, not just by age, but also by entry qualifications. Differences in the academic average across these categories are presented in Table 6. Although it is recognised that some students enter university with more than one entry qualification, the questionnaire asked schools to identify the main qualification used by each graduate to obtain entry to the occupational therapy programme in 1996.

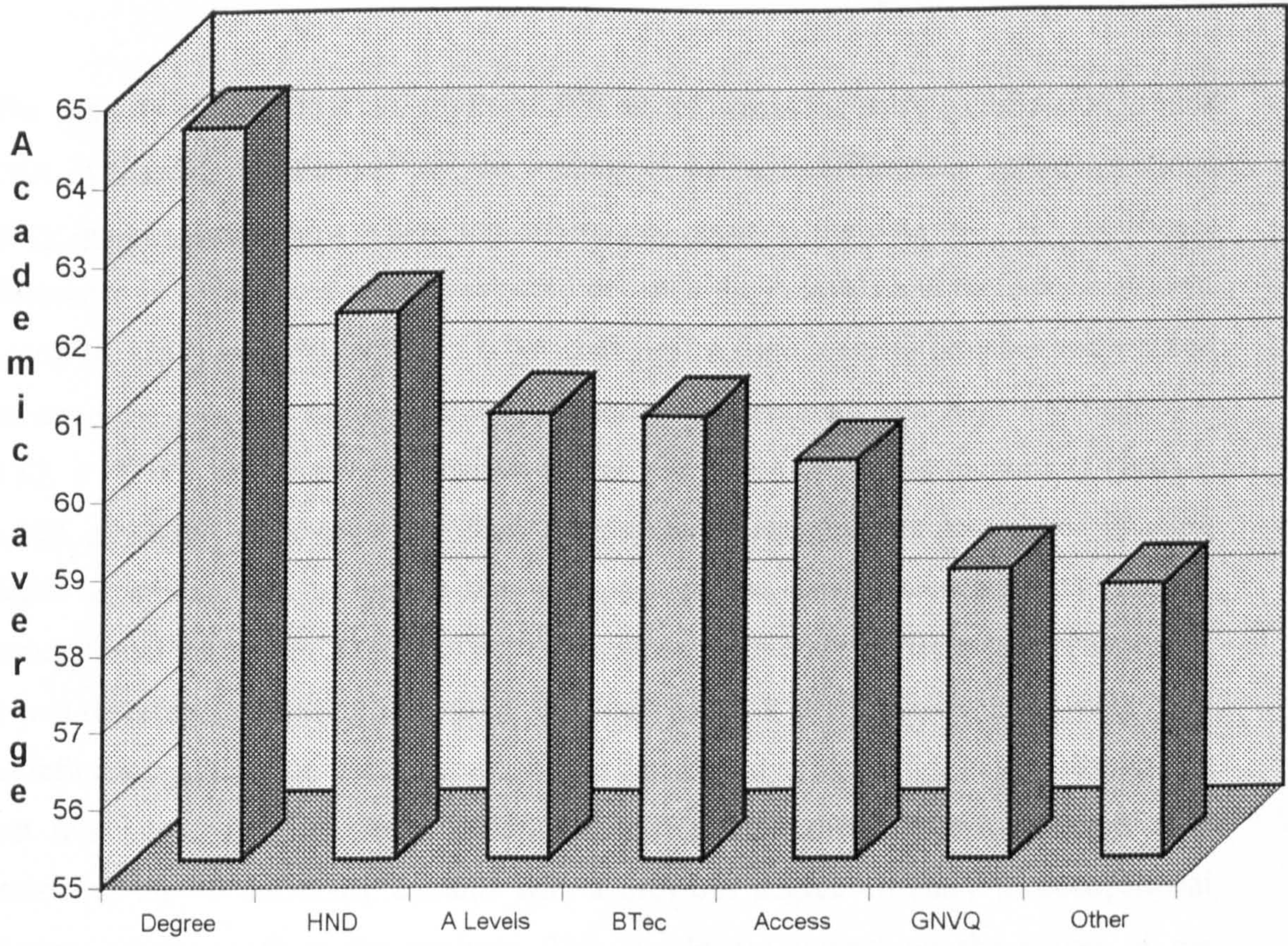
TABLE 6. MEAN ACADEMIC SCORES WITHIN ENTRY QUALIFICATION GROUPS

Entry qualifications	Total number of students in entry qualification category	Academic average of the qualification category
Previous degree	70	64.40
Higher National Diploma	6	62.00
A-levels	188	60.74
BTec	27	60.72
Access course	72	60.15
GNVQ	16	58.73
Other	46	58.52

Other category includes; SRN, City and Guilds, foundation year, European and International baccalaureate, OU credits, Cert HE.

This organisation of the data enabled comparisons to be made of academic performance across students who entered with different entry qualification profiles. Figure 3 clearly shows a hierarchy in the academic average across these entry qualification groups. Those who entered with a previous degree perform best of all. This trend was examined to see if statistically significant differences in the academic averages were observed between the different entry qualification groups.

FIGURE 3. BAR CHART OF ACADEMIC AVERAGES BY ENTRY QUALIFICATION GROUP



Hypothesis Testing Box 2

A one-way ANOVA was conducted to evaluate the null hypothesis that there was no relationship between the independent variable, entry qualifications and the dependent variable, academic average. $F(6, 418) = 5.83, p < 0.000, \eta^2 = 0.077$. Follow-up tests were carried out to examine where these differences arose in the data.

Interpretation of results

Results were significant, indicating that the null hypothesis must be rejected; academic averages differ significantly across the various entry qualification sub-groups. This is confirmed by the effect size showing a large strength of association between the variables entry qualification and academic average.

The analysis of these data indicates that differences across the entry qualification groups exist in the data but further analysis looking at pairwise differences between various entry qualifications show where the differences occur in the data set. No significant difference in academic average was noted between the A-levels and the Access student group ($t(258) = 0.696, p > 0.05$), but statistically significant differences were noted between the previous-degree entrants and those who entered with A-levels ($t(256) = 4.50, p < 0.00$), and between previous-degree entrants and Access entrants ($t(140) = 4.159, p < 0.00$). The impact of having a degree on entry was thus explored in more depth as it was seen to have a major impact on the data. Those students entering occupational therapy programmes with a previous degree are de facto mature students, it was therefore reasonable to assume that their superior performance might have been an influencing factor on the age comparisons carried out at the earlier in this chapter. To test this hypothesis the t-test carried out to test Hypothesis 1 was repeated after removing the 70 university entrants with a previous degree on entry to occupational therapy education from the analysis. This would not impact on the power of the analysis, as there was a surplus of respondents in the sample.

Hypothesis Testing Box 3

A t-test was carried out to test the null hypothesis that there was no difference in the final academic average of graduates between the two age categories, excluding those who entered with a previous degree, $t(353) = 1.412, p > 0.05, \eta^2 = 0.005$.

Interpretation of result

Results of this analysis now show no significant difference in the final academic average of graduates between the two age categories as confirmed by the very small effect size. This finding gives credence to the impact of entry qualifications on the final academic averages.

The impact of entry qualifications on any analysis of age differences thus needed to be assessed simultaneously, using a two-way ANOVA, where the interaction effect between age and entry qualifications could be tested. The result of this more sophisticated statistical analysis confirmed the dominance of entry qualification over age in the statistical model. The results of the two-way ANOVA show no overall statistical significant difference between the two age categories ($F(1) = 0.67, p = 0.414, \eta^2 = 0.002$) when taking into account the influence of entry qualification. This is due to the fact that in a two-way ANOVA marginal means are used to calculate differences rather than the full data set of continuous academic averages used for the analysis in Hypothesis Testing Box 1.

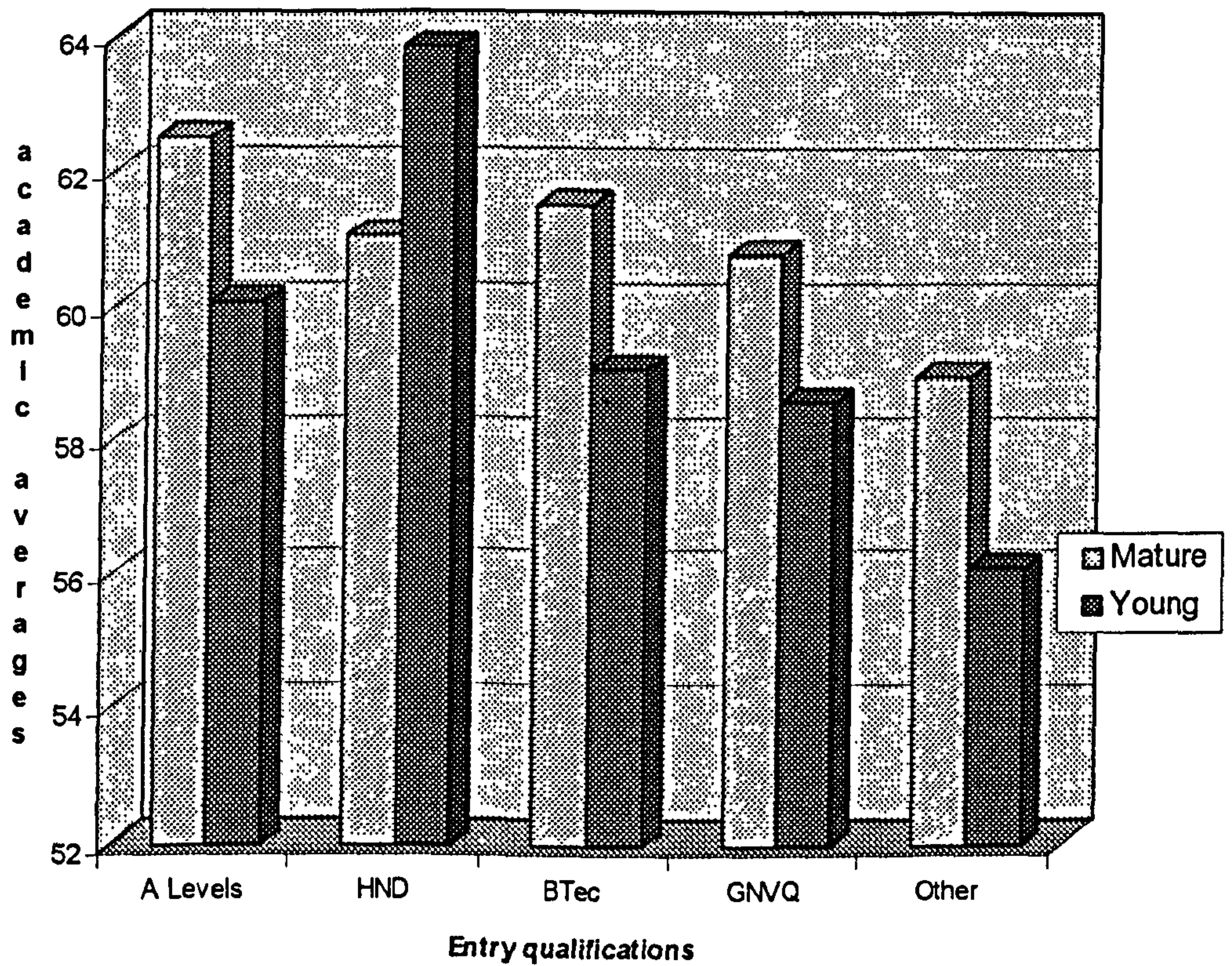
TABLE 7. MARGINAL MEANS OF AGE AND ACADEMIC AVERAGE WITHIN ENTRY QUALIFICATION GROUPS

Entry qualifications	Under 21		Over 21		Statistical tests of age differences <u>within</u> entry qualification group
	Academic average	n=	Academic average	n=	
A-levels	60.10	138	62.51	50	$F(1,186)=6.328, p<0.05^*$
Degree	-	0	64.39	70	No comparison feasible
Access course	-	0	60.15	72	No comparison feasible
BTec	59.08	9	61.53	18	$F(1,25) = 1.064, p>0.05$
GNVQ	58.59	15	60.80	1	$F(1,14) = 0.239, p>0.05$
HND	63.85	2	61.08	4	$F(1,4) = 0.227, p>0.05$
Other	56.02	7	58.96	39	$F(1,44) = 1.189, p>0.05$

*= Statistically significant

The two-way ANOVA showed a significant main effect for entry qualifications by themselves, (Main effect; $F(6) = 4.724$, $p < 0.000$, $\eta^2 = 0.064$), indicating the strength of the entry qualification, not the age, in predicting academic attainment. The two-way ANOVA analysis showed no significant interaction effect for age and entry qualifications indicating that the variation in academic average across the entry qualifications groups is not due to impact of age related factors (Interaction effect; $F(4) = 0.261$, $p = 0.903$, $\eta^2 = 0.0003$). The data were also analysed separately for each age differences within each entry qualification group where feasible. Results presented in Table 7 show significant age differences only within the A-level group ($F(1,86) = 6.328$, $p < 0.05$) where mature students performed better in university than younger A-level entrants but no other statistical age differences were observed. Figure 4 displays these findings by showing the age differences in the academic average within the entry qualification group. In most cases the mature student academic average is higher than younger students. The only exception to this finding was the academic averages of the six students who entered with a Higher National Diploma (HND). Figure 4 illustrates these findings by showing the small variations in academic average between age groups within an entry qualification group and the wider variations in the academic averages between the different entry qualification groups. The superior performance of some students over others is clearly defined by the entry qualification rather than the age of the university entrant.

FIGURE 4. BAR CHART OF ACADEMIC AVERAGES BY AGE AND ENTRY QUALIFICATIONS



SUMMARY OF THE ANALYSIS OF DATA FROM OCCUPATIONAL THERAPY SCHOOLS

This analysis of age and academic performance in occupational therapy initially provides a picture of mature student success. However, caution must be taken in interpreting these results, as having a previous degree on entry to occupational therapy strongly influenced the data. The significant effect of age on academic average was negated when the variable of entry qualifications was added to the analysis. A two-way ANOVA confirmed this finding by showing the strong influence of the entry qualifications, not age, in the academic performance of occupational therapy students. The superior performance of the mature student is influenced by entry qualifications and the data showed that having a degree on entry to an occupational therapy degree course predicts higher academic success in occupational therapy education than all other entry qualifications. The next section of this chapter will examine the impact of age on levels of competence in the workplace.

PART 2 - COMPETENCY QUESTIONNAIRE TO EMPLOYERS & GRADUATES

This second section of this chapter outlines the analysis of questionnaires mailed to recent graduates and their employers in 190 occupational therapy departments in Southern England in answer to the second and third research questions of the study;

2. Do employers perceive a difference between mature and young graduates, as measured by an occupational therapy graduate competency rating scale?
3. Does the age of the graduate have an impact on their perceived level of professional competence, as measured by the graduate competency scale?

The response rate, demographic data and analysis are presented and interpreted in the text, tables and graphs of this part of the chapter. The employer questionnaires and the graduate questionnaires were returned independently of each other. Therefore, the results will be presented separately for the employer and graduate data. The primary focus of this second part of the study is the exploration of age and its influence on levels of competence during the early years in professional practice. Comparisons between the mature and younger age group are based on the age of the graduate when he/she began their occupational therapy education. The age at graduation could not be used, as this would vary depending on the length of the course taken to achieve state registration as an occupational therapist.

Response rate

A total of 290 pairs of questionnaires, containing one employer and graduate questionnaires, were sent to a non-probability sample of 190 NHS Trusts between April and June 2000. Table 8 shows that of the 290 pairs of questionnaires sent out, 191 were returned; 102 from employers and 89 questionnaires from graduates. Thirty-seven pairs of questionnaires were returned from departments where no new graduates were employed. The overall response rate for the study was 46% for the survey with a useable response of 33 %. The data are illustrated graphically and presented in Figure 5.

FIGURE 5. STUDY RESPONSE DATA

Competency survey responses

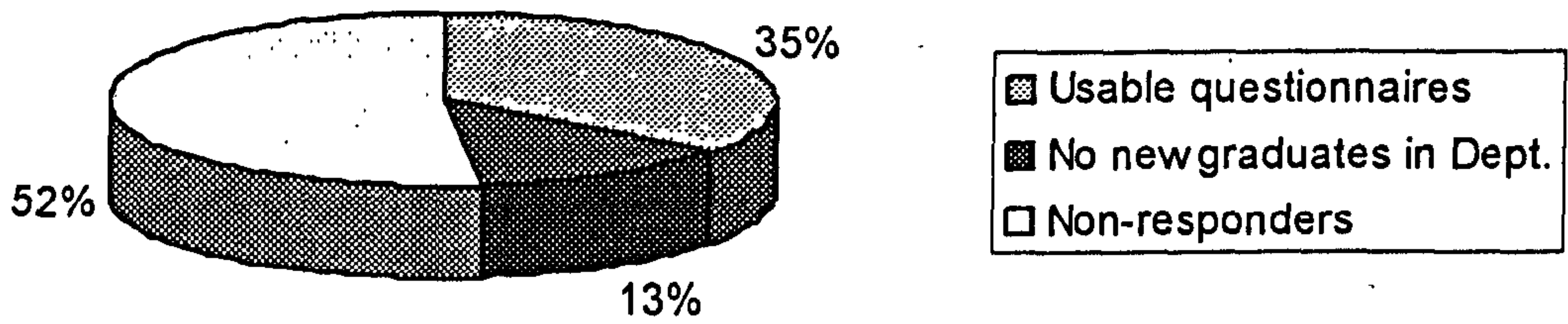


TABLE 8. EMPLOYER AND GRADUATE RESPONDENTS

Employer mailing (n=290)		RESPONSE RATE FOR PART 2 OF THE STUDY	Graduate mailing (n=290)	
Number of responses	Percentage		Number of responses	Percentage
102	35.2	Usable questionnaires	89	30.7
37	12.7	No new graduates – pack returned	37	12.7
151	52.1	Non-Responders	164	56.6
290	100	TOTAL	290	100

Age profile of the sample

Table 9 presents data on the age profile of respondents. The data are presented separately for the employers and the graduate data. With regards to age, the employer data show that 55% of the recent graduates were mature students on starting their occupational therapy course and 45% were young students. In the graduate sample, 56% of the respondents were mature students, and 41% were young students. Two graduates did not indicate their age on their questionnaires.

TABLE 9. AGE PROFILE OF THE RESPONDENTS

Employer data		Age on starting occupational therapy education	Graduate data	
<u>n</u>	%		<u>n</u>	%
40	45	Under 21	42	41
49	55	Over 21	58	57
89	100	TOTAL	100*	98*

*2 graduate cases with missing age related data

It is interesting to note the greater number of mature students in both data sets, which reflects the increasing number of mature entrants to occupational therapy programmes in years 1995 and 1996 (COT, 1999). This predominance of mature students is also confirmed by the data on the 1999 graduates supplied by the eight occupational therapy programmes in Section 1 of these results (see Table 2). However, the greater number of mature students in the graduate sample may also be an indicator of interest in the title of the study from this age group of respondents:

INTERPRETATION OF THE COMPETENCY DATA

The main body of the questionnaire comprised 46 positively worded competency statements. Employers were asked to rate the ability of the new graduate in relation to each of these statements using a four-point rating scale. As mentioned in the previous chapter, the polar ends of this Likert scale were worded as 'strongly agree' and 'strongly disagree' with an intentional lack of a middle category. But there was provision to tick a box saying a skill was not applicable in that clinical setting. Recent graduates were instructed to rate their own level of competence using the same four-point rating scale on a graduate questionnaire. The rating scale was coding 1 to 4, from strongly agree, agree, disagree and strongly disagree, which meant that for each rating - **the lower the score, the greater the perception of competence.** The end point on the scale was only to be used when the skill was not applicable in that clinical setting. These 'not applicable' responses are not considered a sequentially valid ordinal category in the competency scale (Tabachnick & Fidell, 1996). Subjects who ticked this category were coded with the number 5 but this number coding was classified as 'missing data' in the data reduction procedure of factor analysis and subsequent inferential analysis. One item of the questionnaire 'Group Work Skills', was ticked as 'not applicable' by 56 (30%) of the total respondents to this question. An item on a questionnaire with this high a volume of missing data is not considered to be theoretically valid to include in a measure of professional competence and was therefore excluded from the subsequent data analysis (Tabachnick & Fidell, 1996). Data derived from the ratings on the remaining 45 items on the questionnaire were entered into SPSS for coding and statistical analysis.

FACTOR ANALYSIS

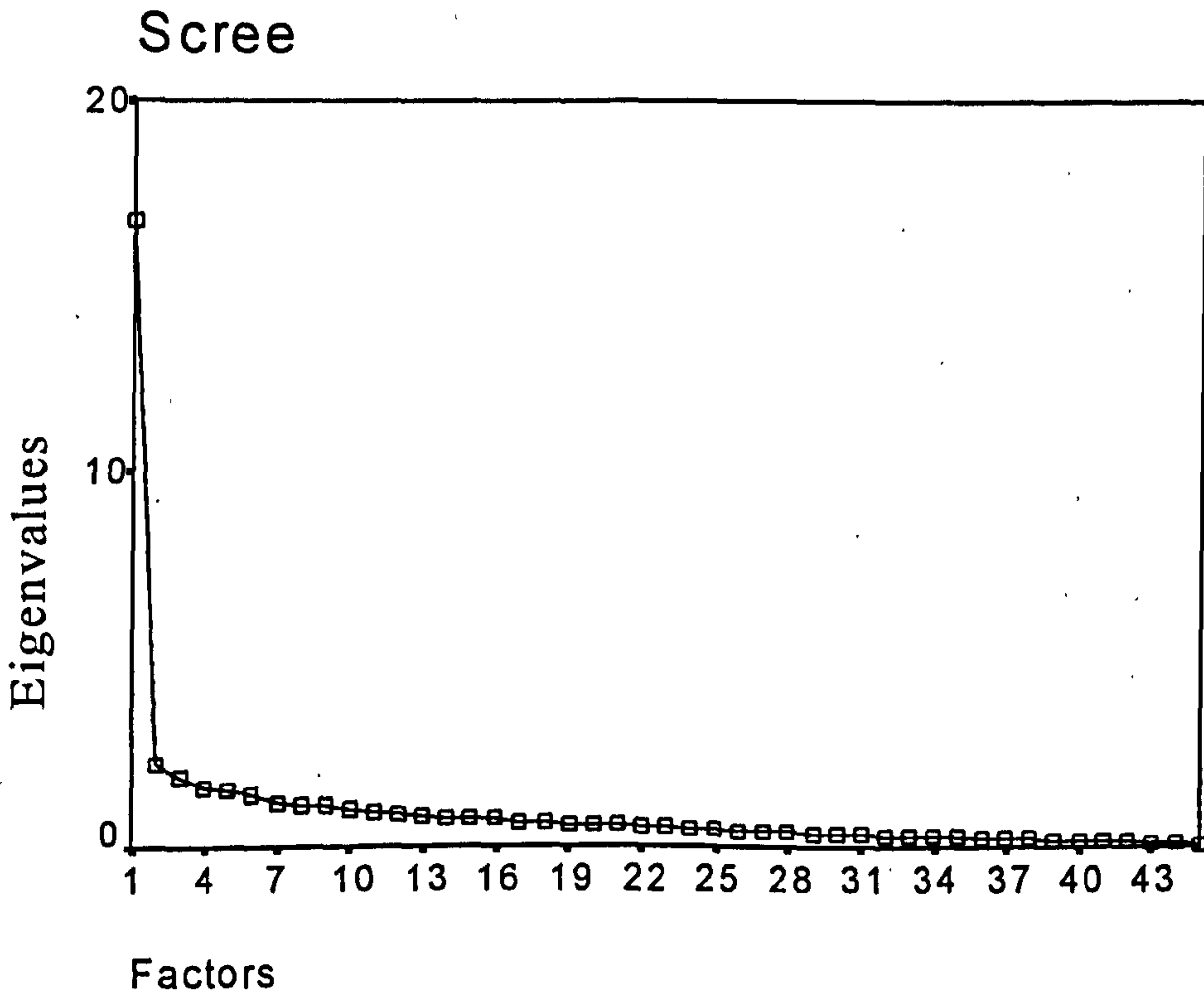
Ratings provided for 45 items on a questionnaire are a cumbersome measure of competency, so it was imperative to reduce the data into meaningful sub-constructs of competence or factors. The statistical tool to achieve this data reduction is exploratory factor analysis, using principal component analysis. Factor analysis analyses how the patterns of responses on the 45 items of questionnaire are inter-correlated. This matrix of correlations allows a mathematical clustering of similar responses into discrete and separate factors, which in turn facilitates more useful interpretation of whole data set. The raw data of this correlation matrix are presented in Appendix 5, section 2. Exploratory factor analysis is particularly appropriate when designing a new

measurement tool as the resulting factors can be used to derive sub-scales of the measure (Munro, 1997). Factor analysis was also deemed an appropriate method of data reduction for this large data set because there were 191 respondents for each of the 45 items measured on the scale (Comrey & Lee, 1992). The key stages of the factor analysis procedure are factor extraction, factor rotation and interpretation of the final factor solution.

Factor extraction

The initial stage of factor analysis is factor extraction as this provides information on the number of underlying factors in the pattern of responses. With a data set of 45 items, the expected number of items would be 9 to 15 factors (Tabachnick & Fidell, 1996). The initial unrotated solution for this analysis indicated 10 factors with an eigenvalue above Kaiser's criterion of the value of one. An eigenvalue represents the total amount of variance or variability in ratings explained by the factor. In this 10-factor solution 66.3% of the total variance in the questionnaire ratings was explained by 10 separate and discrete factors. The full factor extraction solution is presented in Appendix 5, section 2 where all 45 variables are accounted for in the factor solution. The 10-factor solution can be observed in Figure 6 - the Scree plot where eigenvalues are plotted against factors. At this stage the factor analysis is unrotated and the first factor extracted accounts for the largest amount of variability amongst the items and as such is usually un-interpretable. Rotation of the correlation matrix provides a more meaningful interpretation and can also confirm the number of factors to be retained in the final interpretation of data.

FIGURE 6. SCREE PLOT OF UNROTATED 10-FACTOR SOLUTION



Factor rotation

Rotation of the correlation matrix was implemented using an orthogonal varimax rotation. This provides greater interpretability of the data by reassigning the variance across the 10 factors. This method of rotation was chosen over an oblique rotation as the scores on the 45 items from the questionnaire were theoretically independent of one another and the derived factors would also need to be used as independent variables in subsequent inferential analysis of the data (Tabachnick & Fidell, 1996). In the initial solution, 37% of the variance was loaded on factor one, but Table 10 below shows how this variance has been more evenly distributed across the 10 factors by rotating the matrix solution.

TABLE 10. EIGENVALUES AND VARIANCE IN THE INITIAL FACTOR EXTRACTION AND THE ORTHOGONAL FACTOR ROTATION.

Factor	Un-rotated Eigenvalues	% Variance	Rotated Eigenvalues	% Variance
1	16.73	37.18	4.20	9.33
2	2.25	5.00	4.20	9.33
3	1.87	4.16	4.10	9.11
4	1.61	3.57	3.27	7.28
5	1.52	3.38	3.16	7.04
6	1.43	3.17	2.74	6.10
7	1.19	2.64	2.69	5.98
8	1.11	2.48	2.16	4.81
9	1.10	2.44	1.74	3.87
10	1.02	2.27	1.55	3.45

Interpretation of the factor solution

The results of the rotated factor matrix provided the opportunity to interpret the data by studying the relationship between the 45 items of the questionnaire and how they related to each of the emerging 10 factors. Items that are unrelated to others within a factor were also identified at this stage of the analysis. Close examination of the rotated correlation matrix revealed strong correlations between groupings of items for the initial eight factors of the analysis. But factors 9 and 10 included only one item from the questionnaire loaded on each of these factors respectively - see Table 11. Interpretation of factors, defined by one item on a questionnaire, is hazardous and it is recommended that the factor be deleted from the final factor solution (Tabachnick & Fidell, 1996). Factor 9 included one question item *'Justify decisions and interventions from a theoretical base'* but this item also had a moderate loading on factor 5 and as it was more conceptually linked to this factor, it was manually reassigned to this position in the final factor solution. In contrast, factor 10, also with the single question item *'health promotion and education'* had a very weak relationship with all other factors and because of this was excluded from the final solution.

The 44 items located on the first eight factors were examined for conceptual cohesion and the factors named accordingly. A priori classifications of competence identified

from the literature and professional standards documents also guided the interpretation of the factors. Table 10 presents 'factor loadings' which are values that indicate the strength of the correlation between the item on the questionnaire and its home factor. The value of the loading should range from -1 through to +1, similar to any other correlational analysis. The loadings are presented in hierarchical order within the factor, and in the majority of cases achieve values above the accepted cut off of 0.30, indicating a greater than 10% overlap in the variance shared between the item on the questionnaire and the factor where it is located (Tabachnick & Fidell, 1996).

Two items of the questionnaire were excluded from this interpretation phase of the analysis because in the case of one question on the questionnaire, the ratings provided by respondents were not coherently linked to any other items in the questionnaire. Additionally, the group work related question had a significant amount of missing data and was not included in the original factor analysis. However, the pattern of responses for these questions are presented in Table 12 so that the high levels of competence demonstrated by new graduates can be observed descriptively.

TABLE 11. FACTOR SOLUTION FOR THE QUESTIONNAIRE

FACTOR	Questionnaire variables in each of the factors	Loadings
Factor 1 - Professional development and reflection		
1	Use supervision and/or consultation to promote personal effectiveness & competence	.771
1	Draw on the principle of supervision in relation to self and others	.723
1	Give, receive and respond to constructive feedback on performance	.672
1	Reflect on, and critique own performance and the performance of others	.597
1	Work to, and articulate the limits of his/her own competence and seek help and guidance accordingly	.557
1	Evaluate his/her own professional practice and the service provided to users	.380
Factor 2 - Work management skills		
2	Work with change	.634
2	Prioritise referrals based on information and organisational policy	.611
2	Work both as an independent practitioner and collaboratively as a member of a team to effect service delivery	.559
2	Reason effectively, make judgements & take decisions to A-level of competence commensurate with a qualifying practitioner	.521
2	Demonstrate self management skill and independence in thought and action	.497
2	Maintain appropriate records of therapeutic activity	.480
2	Contribute to the work of the organisation in which employed as an occupational therapist	.394
2	Share acquired knowledge and skills with others using various teaching and presentation skills & methods	.392
Factor 3 - Professional standards, autonomy and accountability		
3	Work to the profession's Code of Ethics and Professional Conduct	.670
3	Take personal responsibility for professional performance and actions	.659
3	Work with legal, ethical and professional parameters	.657
3	Work safely as an occupational therapist	.652
3	Specify and work to legislation which affect service delivery and his/her own practice	.621
3	Demonstrate personal conduct conducive with professional status	.550
Factor 4 - Therapeutic intervention skills		
4	Select and use standardised and non-standardised assessments and identify service users' functional capacity, occupational performance strengths and deficits	.710
4	Select, adapt and use therapeutic media, techniques and activity (to assist the service user) to maintain, enhance, or come to terms with changes in occupational performance	.602
4	Undertake role, functional, task and activity analysis	.526
4	Demonstrate attitudes which ensure that service users' and carers' expressed needs and choices become the focus of the care management process	.496
4	Assess and manage the care of people with occupational performance deficits in self-care productivity or leisure; enable them to achieve functional performance in their chosen environment as independently as they would wish and as their circumstances allow	.466
4	Integrate knowledge and professional skills and so work with people with multiple and complex needs,	.394

	Factor 5 - Theoretical and clinical reasoning	
5	Justify decisions and interventions on the basis of service user need and available resources	.720
5	Have a sound theoretical basis to underpin occupational therapy practice when working with people of all ages and people who have physical dysfunction social dysfunction, mental health problems or learning disabilities	.656
5	Select and apply theoretical frameworks pertinent to occupational therapy and use them selectively to guide intervention	.596
5	Justify decisions and interventions from a theoretical base (see factor 9 also)	.269
	Factor 6 - Research skills	
6	Use experience, research and professional knowledge and skills to enhance the development of occupational therapy in general	.718
6	Apply the principles of quality assurance, including methods of audit, to his/her own practice	.611
6	Use experience, research and professional knowledge and skills to enhance personal development of graduates	.557
6	Draw on research on practice and establish the evidence on which to base practice	.457
	Factor 7 - Professional attitudes and behaviours	
7	Work with service users from diverse cultural and ethnic groups	.578
7	Describe the unique perspective from which occupational therapists approach their work	.512
7	Take steps to develop knowledge and expertise and engage in continuing professional development	.481
7	Draw on ethical principles in the process of reasoning	.436
7	Articulate and work to the value base and principles which underpin occupational therapy practice	.418
7	Reflect on his/her professional practice and the service provided to users	.392
7	Share information to empower the service user	.380
	Factor 8 - Service evaluation and risk assessment	
8	Appraise methods of service delivery	.688
8	Recognise factors that affect the health of the practising professional and take steps to minimise risk of harm to self and others	.524
8	Assess risk and take decisions related to the ability of the service user to function in his/her community environment	.424
	Factor 9	
9	Justify decisions and interventions from a theoretical base	.728
	Factor 10	
10	Actively promote and apply the principles of health promotion and education	.860

TABLE 12. DESCRIPTIVE PRESENTATION OF ITEMS EXCLUDED FROM THE COMPETENCY QUESTIONNAIRE TO EMPLOYERS AND GRADUATES

Text of excluded question items	Likert scale	Number of responses	Percentage Response
I / they can participate in groups, facilitate group work, understand group dynamics and understand the roles and the influences on groups and teams.	Strongly agree	31	16.2
	Agree	85	44.5
	Disagree	15	7.9
	Strongly Disagree	0	0
	Not applicable	56	29.3
	Missing data	4	2.1
I / they can actively promote and apply the principles of health promotion and education.	Strongly agree	34	17.8
	Agree	119	62.3
	Disagree	24	12.6
	Strongly Disagree	2	1
	Not applicable	7	3.7
	Missing data	5	2.6

Reliability of the competency scale

Kirshner and Guyatt (1985) suggest testing any newly developed measurement tool or questionnaire for internal reliability and discriminant validity if the measure will be used to make judgements about levels of ability between people. The reliability of this competency measurement scale was thus determined from analysing the internal consistency of the factors. These procedures ensured that the items from the questionnaire located in each of the eight factors could be theoretically combined and interpreted as a unique factor. Cronbach's coefficient alpha was calculated for each factor and the results presented in Table 13 below show alpha coefficients ranging from 0.67 to 0.80 which indicate acceptable levels of internal reliability within each factor. See Appendix 5, section 2.

TABLE 13. INTERNAL RELIABILITY OF THE 8 SUB-SCALES OF COMPETENCE

Factor	Sub-scale of competence	Cronbach's Alpha
1	Professional development and reflection	0.86
2	Work management skills	0.86
3	Professional standards, autonomy and accountability	0.83
4	Therapeutic intervention skills	0.82
5	Theoretical and clinical reasoning	0.75
6	Research skills	0.76
7	Professional attitudes and behaviours	0.84
8	Service evaluation and risk assessment	0.67

Validity of the scale

To achieve high discriminant validity, an item from the questionnaire should be more highly correlated with the items within its factor than with the questionnaire items located on another factor. To test this assumption, a bivariate correlation procedure was carried out on the data set to determine the strength of the correlation between individual item scores within each factor and the total score for the remaining seven factors. The analysis was carried out for each of the 44 items of the questionnaire and the findings are presented in Table 14 below. This table indicates, in bold text, the strength of the relationship between the item and the factor they are associated with. The relationship between the items, and factors that they are not loaded with, show much lower levels of correlation thus highlighting the discriminant validity of the measure. These findings clearly indicate that the items associated with an individual factor are truly related to that factor alone and not related to any of the seven other factor.

Conclusion to the factor analysis

To conclude, factor analysis of the responses to the items on the questionnaire has given rise to eight factors. The high level of internal reliability within each factor, and the theoretical independence demonstrated by the discriminant validity testing means that each factor can now be considered a separate and discrete sub-scale of competence and enable inferential analysis of age differences within the data (Bryman & Cramer, 1999).

TABLE 14. DISCRIMINANT VALIDITY OF THE COMPETENCY MEASURE, CORRELATIONS BETWEEN ITEMS ON QUESTIONNAIRE THE AND SUB-SCALES		Sub-scales							
		1	2	3	4	5	6	7	8
Items from the questionnaire									
Factor 1 – Professional development and reflection									
	Use supervision and/or consultation to promote personal effectiveness & competence	.80	.49	.41	.49	.47	.41	.48	.33
	Draw on the principle of supervision in relation to self and others	.79	.50	.39	.48	.46	.47	.56	.41
	Give, receive and respond to constructive feedback on performance	.79	.57	.52	.40	.35	.44	.43	.43
	Reflect on, and critique own performance and the performance of others	.78	.47	.42	.37	.43	.45	.57	.47
	Work to, and articulate the limits of his/her own competence and seek help and guidance accordingly	.74	.68	.49	.50	.39	.38	.52	.52
	Evaluate his/her own professional practice and the service provided to users	.72	.52	.49	.61	.46	.47	.60	.57
Factor 2 - Work management skills									
	Work with change	.53	.73	.50	.48	.37	.44	.50	.41
	Prioritise referrals based on information and organisational policy	.49	.74	.49	.51	.40	.39	.44	.57
	Work both as an independent practitioner and collaboratively as a member of a team to effect service delivery	.56	.76	.53	.56	.37	.46	.54	.49
	Reason effectively, make judgements & take decisions to A-level of competence commensurate with a qualifying practitioner	.43	.72	.44	.57	.59	.44	.48	.42
	Demonstrate self management skill and independence in thought and action	.55	.75	.47	.54	.48	.46	.53	.42
	Maintain appropriate records of therapeutic activity	.38	.66	.45	.45	.34	.37	.52	.43
	Contribute to the work of the organisation in which employed as an occupational therapist	.53	.71	.47	.44	.46	.56	.52	.45
	Share acquired knowledge and skills with others using various teaching and presentation skills & methods	.55	.67	.35	.55	.48	.52	.58	.34
Factor 3 - Professional standards, autonomy and accountability									
	Work to the profession's Code of Ethics and Professional Conduct	.48	.58	.81	.47	.30	.49	.50	.43
	Take personal responsibility for professional performance and actions	.57	.55	.78	.51	.44	.54	.55	.56
	Work with legal, ethical and professional parameters	.46	.51	.77	.52	.39	.43	.55	.52
	Work safely as an occupational therapist	.54	.64	.81	.58	.38	.46	.52	.51
	Specify and work to legislation which affect service delivery and his/her own practice	.40	.44	.72	.46	.37	.44	.47	.49
	Demonstrate personal conduct conducive with professional status	.28	.29	.66	.24	.21	.32	.27	.19

TABLE 14. DISCRIMINANT VALIDITY OF THE COMPETENCY MEASURE, CORRELATIONS BETWEEN ITEMS ON QUESTIONNAIRE THE AND SUB-SCALES

Items from the questionnaire	Sub-scales							
	1	2	3	4	5	6	7	8
Factor 4 - Therapeutic intervention skills								
Select and use standardised and non-standardised assessments and identify service users' functional capacity occupational performance strengths and deficits	.35	.45	.51	.72	.43	.45	.52	.40
Select, adapt and use therapeutic media, techniques and activity, to assist the service user to maintain, enhance, or come to terms with changes in occupational performance	.43	.56	.32	.75	.48	.43	.51	.41
Undertake role, functional, task and activity analysis	.52	.51	.48	.71	.46	.33	.54	.47
Demonstrate attitudes which ensure that service users' and carers' expressed needs and choices, become the focus of the care management process	.46	.38	.39	.65	.39	.30	.47	.38
Assess and manage the care of people with occupational performance deficits in self-care productivity or leisure; enable them to achieve functional performance in their chosen environment as independently as they would wish and as their circumstances allow	.43	.58	.51	.72	4.3	.45	.52	.40
Integrate knowledge and professional skills and so work with people with multiple and complex needs,	.52	.61	.50	.73	.52	.44	.48	.40
Factor 5 - Theoretical and clinical reasoning								
Justify decisions and interventions on the basis of service user need and available resources	.42	.52	.38	.42	.78	.42	.54	.37
Have a sound theoretical basis to underpin occupational therapy practice when working with people of all ages and people who have physical dysfunction social dysfunction, mental health problems or learning disabilities	.42	.50	.38	.50	.82	.43	.48	.32
Select and apply theoretical frameworks pertinent to occupational therapy and use them selectively to guide intervention	.43	.33	.23	.49	.79	.47	.46	.25
Justify decisions and interventions from a theoretical base	.36	.45	.34	.40	.62	.38	.44	.39
Factor 6 - Research skills								
Use experience, research and professional knowledge and skills to enhance the development of occupational therapy in general	.41	.44	.44	.31	.43	.80	.46	.32
Apply the principles of quality assurance, including methods of audit, to his/her own practice	.38	.47	.41	.53	.43	.74	.48	.53

TABLE 14. DISCRIMINANT VALIDITY OF THE COMPETENCY MEASURE, CORRELATIONS BETWEEN ITEMS ON QUESTIONNAIRE THE AND SUB-SCALES		Sub-scales							
		1	2	3	4	5	6	7	8
Items from the questionnaire									
Use experience, research and professional knowledge and skills to enhance personal development of graduates		.55	.53	.50	.39	.44	.74	.48	.53
Draw on research on practice and establish the evidence on which to base practice		.43	.51	.45	.40	.46	.71	.46	.35
Factor 7 - Professional attitudes and behaviours									
Work with service users from diverse cultural and ethnic groups		.37	.39	.39	.40	.32	.36	.66	.33
Describe the unique perspective from which occupational therapists approach their work		.41	.43	.32	.50	.50	.32	.67	.33
Take steps to develop knowledge and expertise and engage in continuing professional development		.54	.53	.51	.44	.39	.57	.70	.41
Draw on ethical principles in the process of reasoning		.50	.55	.43	.54	.50	.44	.71	.52
Articulate and work to the value base and principles which underpin occupational therapists' practice		.48	.54	.46	.49	.57	.49	.71	.34
Reflect on his/her professional practice and the service provided to users		.57	.52	.39	.45	.55	.54	.75	.48
Share information to empower the service user		.56	.60	.52	.57	.40	.42	.73	.59
Factor 8 - Service evaluation and risk assessment									
Appraise methods of service delivery		.38	.45	.34	.44	.38	.44	.50	.78
Recognise factors that affect the health of the practising professional and take steps to minimise risk of harm to self and others		.45	.42	.52	.37	.31	.43	.41	.77
Assess risk and take decisions related to the ability of the service user to function in his/her community environment		.56	.58	.47	.53	.38	.43	.41	.77

PRESENTATION OF THE DATA FOR INFERENTIAL ANALYSIS

The focus of this part of the chapter is an investigation of age and its impact on perceptions of competence. Differences in the two age groups will be explored separately within the competency scores of employer and graduate data using unweighted mean scores for each individual on each of the 8 factors. Although the competency data are ordinal and cannot be assumed to have numerical equality between all points on the rating scale, the additive effect of calculating means for respondent scores has been defended by Knapp (1990). Other researchers who have designed and analysed competency-rating scales using factor analysis have also made use of means to present their data (Adamson et al, 1998; Bartlett et al. 2000). The greatest advantage of using mean values is the fact that they maintain the original characteristics of the positively worded competency statements in the Likert rating scale from strongly agree (1) which denotes competence through to strongly disagree (4) which denotes less competence. The mean values can be interpreted so that the lower the mean score, the greater the perception of competence. For example; if one age group had a low mean of 1.50 this means that this sub-group had, on average, superior levels of competence than a sub-group that had a higher mean of 3.20. Mean scores for the graduate and employer data were calculated by summing the ratings on the first four points of the Likert scale and dividing this figure by the number of item variables within the sub-scale. Table 15 on the following page provided an example of how the means values for the first sub-scale were calculated from the coded graduate responses.

An alternative method of inferential data analysis using computer generated normally distributed factor scores would take into account the loading of each variable within the factor but this approach was rejected, as these factor scores would not reflect the numerical dimensions of the original scale. Munro (1997) upholds this strategy and argues that unweighted mean scores are more appropriate to use when factor analysis has been used to develop a new measurement instrument. However, for the purposes of comparison, a sample of inferential data analysis using computer generated factor scores has been included in Appendix 5, Section 2. However, because of missing data for 90 respondents, the use of computer generated factor scores resulted in a large reduction in the total sample size and therefore increased in the likelihood of making a Type II error. Indeed this inferential data analysis did not show any statistical significant relationship within the employer or the graduate data when analysing age and the factor scores using *t* tests.

TABLE 15. UNWEIGHTED MEAN SCORES OF GRADUATES FOR SUB-SCALE 1

Items in Sub-scale	Likert scale	code	n	Code multiplied by n=
Use supervision and/or consultation to promote personal effectiveness & competence	Strongly agree	1	43	43
	Agree	2	51	102
	Disagree	3	6	18
	Strongly Disagree	4	0	0
	Not applicable /Missing	0	2	0
Number of included responses = 100	Total			163
Mean score for item = $163/100 = 1.63$				
Draw on the principle of supervision in relation to self and others	Strongly agree	1	35	35
	Agree	2	59	118
	Disagree	3	6	18
	Strongly Disagree	4	0	0
	Not applicable /Missing	0	2	0
Number of included responses = 100	Total			171
Mean score for item = $171/100 = 1.71$				
Give, receive and respond to constructive feedback on performance	Strongly agree	1	37	37
	Agree	2	62	124
	Disagree	3	1	3
	Strongly Disagree	4	0	0
	Not applicable /Missing	0	2	0
Number of included responses = 100	Total			164
Mean score for item = $164/100 = 1.64$				
Reflect on, and critique own performance and the performance of others	Strongly agree	1	4	34
	Agree	2	62	124
	Disagree	3	5	5
	Strongly Disagree	4	0	0
	Not applicable /Missing	0	1	0
Number of included responses = 101	Total			163
Mean score for item = $163/101 = 1.61$				
Work to, and articulate the limits of his/her own competence and seek help and guidance accordingly	Strongly agree	1	64	64
	Agree	2	38	76
	Disagree	3	0	0
	Strongly Disagree	4	0	0
	Not applicable /Missing	0	0	0
Number of included responses = 102	Total			140
Mean score for item = $140/102 = 1.37$				
Evaluate his/her own professional practice and the service provided to users	Strongly agree	1	26	26
	Agree	2	74	148
	Disagree	3	2	6
	Strongly Disagree	4	0	0
	Not applicable /Missing	0	0	0
Number of included responses = 102	Total			180
Mean score for item = $180/102 = 1.76$				
Overall graduate mean for sub-scale (items means / number of items) = 1.62				

INFERENCEAL DATA ANALYSIS

Inferential analysis of the data enables statistical inferences to be drawn from the sample that would be applicable to the larger population of recent occupational therapy graduates in the UK. This analysis compared the mean ratings of competence for mature and younger students within each of the eight sub-scales of competence. The decision whether to use parametric or distribution free non-parametric statistics was based on (a) the underlying distribution of sample scores on the eight sub-scales of the competence including homogeneity of variance and (b) the level of measurement used in the questionnaire. To satisfy all the assumptions associated with the use of parametric statistics, the scores on the eight sub-scales of competence need to be normally distributed with the ratings measured on an interval or ratio scale.

The level of measurement used to rate competency in this questionnaire was a Likert scale that is classified as ordinal data. Although Munro (1997) argues that it is no longer invalid to use parametric tests with ordinal data, the eight sub-scales were statistically analysed for the shape of the distribution using measures of skew and kurtosis. Table 16 presents the results of this analysis for each sub-scale. Results of this analysis of skew and kurtosis show that only one of the three sub-scales was normally distributed and a bi-modal distribution was found in another sub-scale.

TABLE 16. SKEW AND KURTOSIS IN THE 8 SUB-SCALES OF COMPETENCE

Sub-scale of competence	Measure of Skew	Measure of Kurtosis	Shape of distribution
Professional development and reflection	2.05	1.27	Not normal (Skewed)
Work management skills	1.44	0.70	Normal
Professional standards, autonomy and accountability	1.59	0.46	Not normal (Bi-modal)
Therapeutic intervention skills	0.07	2.44	Not normal (Leptokurtic)
Theoretical and clinical reasoning	0.30	2.11	Not normal (Leptokurtic)
Research skills	0.14	2.00	Not normal (Leptokurtic)
Professional attitudes and behaviours	-1.26	-0.42	Normal
Service evaluation and risk assessment	-1.04	-0.74	Normal

The figures presented in Table 16 can be interpreted in terms of the normal distribution curve, where values should lie between +1.96 and -1.96 if the distribution is to be considered normal. The table shows that the data are predominately non-normal in distribution, which given the ordinal level of measurement, meant a decision was made to use distribution free non-parametric statistics to carry out the inferential analysis of the data. Although means are used to display the data in the descriptive tables they are not used to analyse the data. The data remained ordinal and was ranked for analysis using non-parametric statistics.

The Mann-Whitney U Test for unrelated samples and the Kruskal-Wallis one-way ANOVA, have been chosen to explore statistical differences in the ranked competency scores across the demographic groups. These tests are more powerful than any test comparing differences in median scores, as they assign ranks to the full range of competency scores and record the number of times a score from one of the sub-groups is ranked higher than a score from another sub-group. This comparison of ranks uses the full range of scores from the data set as it considers the rank value of each score rather than its location relative to a mean or median (Bryman & Cramer, 1999; Siegel & Castellan, 1988). Levels of statistical significance are obtained by transforming the Mann-Whitney U score into a standard Z score and as the Kruskal-Wallis is closely approximated to the Chi-squared distribution, significance can be ascertained from using Chi-squared tables.

HYPOTHESIS TESTING OF RESEARCH QUESTIONS

The second and third research questions of this study relate to the age and level of competency in new graduates. Results of all inferential analysis and hypothesis testing are again presented and interpreted with a separate text box throughout this chapter. This will again enable the reader to make meaningful judgements about the inferences drawn from these tests in comparison to the descriptive analysis of the data presented.

2. Do employers perceive a difference between mature graduates and young graduates, as measured by an occupational therapy graduate competency rating scale?
3. Does the age of the graduate have an impact on their perceived level of professional competence, as measured by the graduate competency scale?

ANALYSIS OF AGE AND ITS IMPACT ON LEVELS OF COMPETENCE

The data were analysed separately for employer and graduate groups. Question 2 was analysed using the employer data and question 3 using the graduate data. Both analyses were carried out using the Mann-Whitney U tests of differences in the mean ranks of scores between the two age categories. A full computer print out of these analyses are available in Appendix 5, section 2. The independent variable was age and the dependant variables the ratings of competency for each of the eight sub-scales. Table 17 and 18 provides data for the different age sub-groups and highlights where statistically significant differences occur in the data.

Employer ratings of recent graduates' competence

Table 17 shows how employers have rated new graduates, irrespective of age, to be the most competent in '*professional standards, autonomy & accountability*'. The mean competency scores vary within the age groups but all graduates were perceived to be competent, having scores located at the lower and more competent end of the rating scale.

TABLE 17. DESCRIPTIVE STATISTICS FOR AGE GROUPS WITHIN THE EMPLOYER RATINGS.

	Sub-Scale of competence	Employer Mean scores		Mann-Whitney U results
		Under 21 n = 40	Over 21 n = 49	P values
1	Professional development and reflection	1.84	1.76	p>0.05
2	Work management skills	1.94	1.83	p>0.05
3	Professional standards, autonomy & accountability	1.75	1.69	p>0.05
4	Therapeutic intervention skills	1.98	1.92	p>0.05
5	Theoretical and clinical reasoning	1.93	1.91	p>0.05
6	Research skills	2.05	1.89	p>0.05
7	Professional attitudes and behaviours	1.87	1.75	p>0.05
8	Service evaluation and risk assessment	2.03	1.96	p>0.05

Table 17 presents the employer competency ratings for the two age groups using mean values. The younger graduates had higher mean scores and thus lower levels of competence than mature graduates. This indicates that employers considered graduates

who began their occupational therapy education over the age of 21 to be more competent in most aspects of practice than their younger peers. However, as presented in Hypothesis Testing Box 4, none of these differences in scores achieved the level of statistical significance, so caution must be taken in interpreting the results as they could be due to chance or too small a sample size to show significance.

Hypothesis Testing Box 4

Mann-Whitney U tests of differences in the mean ranks was conducted to evaluate the null hypothesis that there was no difference in the level of competency exhibited by mature and younger graduates and, therefore, all scores should be equal as they arise from the same underlying population.

Interpretation of the result – There is no significant difference in the levels of competence, as rated by employers, between those students who started their occupational therapy course under the age of 21 and those who started occupational therapy over the age of 21. The null hypothesis was not rejected

Graduate self-ratings of competence

The graduate data are presented in Table 18 below. Graduates, irrespective of age, perceived themselves to be most competent in '*professional standards, autonomy & accountability*', which mirrors the employer data. Graduates' scores were also located in the most competent end of the scale, which implies that, in general, new graduates felt competent in their threshold abilities. The means scores for the younger graduates were higher indicating lower perceptions of competence in this group as opposed to the higher ratings of competence provided by the mature student graduates. Therefore, graduates who began their occupational therapy education over 21 years of age considered themselves to be more competent in all aspects of professional practice than their younger peers. Statistically significant differences between the mature and younger students were found for three out of the eight sub-scales of competence.

TABLE 18. STATISTICS FOR AGE GROUPS WITHIN THE GRADUATE RATINGS.

Sub-Scale of competence	Graduate Mean scores		Mann-Whitney U
	Under 21	Over 21	
	n = 42	n = 58	P values
1 Professional development and reflection	1.71	1.57	p>0.05
2 Work management skills	1.69	1.57	p>0.05
3 Professional standards, autonomy & accountability	1.53	1.49	p>0.05
4 Therapeutic intervention skills	1.83	1.75	p>0.05
5 Theoretical and clinical reasoning	2.13	1.90	p<0.05*
6 Research skills	2.02	1.83	p<0.05*
7 Professional attitudes and behaviours	1.83	1.62	p<0.05*
8 Service evaluation and risk assessment	1.80	1.75	p>0.05

*= Statistically significant differences (p<0.05) between the age groups- 2 missing cases

Hypothesis Testing Box 5.

Mann-Whitney U tests of differences in the mean ranks were conducted to evaluate the null hypothesis that there was no difference in the self-perceived ratings of competency of mature and younger graduates and therefore, all scores should be equal as they arise from the same underlying population of new graduates.

Interpretation of the result – mature graduates consider themselves to be more competent than younger graduates for the following aspects of professional competence;

- ❖ Sub-scale 5. '*Theoretical and clinical reasoning*,' Z = -2.974, p = 0.003,
- ❖ Sub-scale 6, '*Research skills*', Z = -2.046, p = 0.041
- ❖ Sub-scale 7. '*Professional attitudes and behaviours*' Z = -2.585, p = 0.010,

The null hypothesis was rejected for each of these three sub-scales but not rejected for the remaining 5 sub-scales. Although effect size scores cannot be calculated for this non-parametric test, the difference between the mean ranks can serve as an effect size index (Munro, 1997).

- ❖ Sub-scale 5. '*Theoretical and clinical reasoning*,' Difference in mean ranks = 16.9
- ❖ Sub-scale 6, '*Research skills*', Difference in mean ranks = 11.7
- ❖ Sub-scale 7. '*Professional attitudes & behaviours*', Difference in mean ranks = 14.9

Summary of the analysis of age and its impact on levels of competence

In answer to the second research question 'Do employers perceive a difference between mature graduates and young graduates, as measured by an occupational therapy graduate competency rating scale? The analysis of the data shows that employer' ratings of the levels of competence in mature and younger graduates do not differ statistically between the two age groups.

In answer to the third research question 'Does the age of the graduate have an impact on their perceived level of professional competence, as measured by a graduate competency rating scale? The analysis of the data shows that mature graduates perceive themselves to be more competent than younger graduates in '*Theoretical and clinical reasoning*', '*Research skills*' and '*Professional attitudes and behaviours*' but have the same levels of competence as younger graduates for all other aspects of competence measured by the questionnaire.

IMPACT OF POTENTIAL CONFOUNDING VARIABLES ON LEVELS OF COMPETENCE

The research questions have been answered but no analysis of age differences would be complete without analysing the potential impact and confounding effect of other variables on levels of competence. The data were thus analysed by grouping the responses not in terms of age but in relation to the demographic variables listed below. These new independent variables were subjected to similar hypothesis testing to investigate the statistical significant impact of these variables had on levels of competence in graduate and employer data. Eta squared indices of $\eta^2 =$ are presented where available. Kruskal-Wallis tests were used to carry out this analysis, as there were more than two categories in each of the variables. A full computer print out of these analyses are available in Appendix 5, section 2.

- ❖ *Type of education programme undertaken*; e.g., full-time for three or four year degree, in-service degree, Postgraduate Diploma.
- ❖ *Level of degree/diploma awarded*; e.g., 1st, 2:i, 2:ii, or 3rd class honours degree, unclassified or ordinary degree, or Postgraduate Diploma (Pass).
- ❖ *Year of qualification*; e.g., 1997, 1998 or 1999.

Type of occupational therapy education

The type of occupational therapy education programme undertaken by the respondents is presented descriptively in Table 19. The table shows the type of education route taken by age category within the employer and graduate data. The BSc (Hons) Occupational Therapy can be seen to be the most frequently taken route to state registration as an occupational therapist. Mature students are more evident in the in-service and post-graduate diploma routes.

TABLE 19. TYPE OF EDUCATION PROGRAMME UNDERTAKEN BY AGE GROUP

Employer data n=88*		Type of occupational therapy education route taken	Graduate data n=100*	
Under 21 (n=39)	Over 21 (n=49)		Under 21 (n=42)	Over 21 (n=58)
39	36	BSc (Hons) Occupational Therapy, Three-years full-time	39	44
0	1	BSc (Hons) Occupational Therapy, Four-years full-time (Scotland and NI only)	2	0
0	8	BSc (Hons) Occupational Therapy, Four-years in-service	1	7
0	2	BSc (Hons) Occupational Therapy, Four-years part-time	0	3
0	2	Postgraduate Diploma in OT	0	4

*2 graduate cases and one employer with missing age related data.

Ratings of competence by type of education route undertaken

This analysis sought to explore if the type of occupational therapy education programme undertaken had an impact on the ratings of competency rather than age. The data presented in Table 20 shows the employers' ratings of competence on the left-hand column and the graduates' self-ratings in the right hand column. The mean scores for the employer and graduate data can be compared visually but were not analysed comparatively as they are unmatched data.

An interesting finding in the employer data is the finding that in-service graduates are perceived to be more competent in practice than graduates of other types of occupational therapy education programmes. Their scores are lower for seven out of the eight sub-scale of competence. Only in '*work management skills*' do the two graduates holding post-graduate diplomas perform to a more competent level. It should also be noted how highly competent the in-service graduates are perceived to be in '*therapeutic intervention skills*'. However, the results presented in Hypothesis Testing Box 6 show none of these differences in mean scores achieved the level of statistical significance, so caution must be taken in interpreting the results as they could be due to chance and/or low numbers in some of the subgroups as presented in Table 19.

TABLE 20. TYPE OF OCCUPATIONAL THERAPY EDUCATION AND MEAN SCORES

Employer mean scores (n=89)	Sub-Scale of competence	Graduate mean scores (n=102)
1.84 1.83 1.40 1.66 1.66	(1) Professional development & reflection Three-year full-time Four-year full-time In-Service programme Postgraduate Diploma Four-year part-time	1.63 1.41 1.64 1.73 1.77
1.89 2.00 1.75 1.74 1.68	(2) Work management skills Three-year full-time Four-year full-time In-Service programme Postgraduate Diploma Four-year part-time	1.61 1.43 1.64 1.75 2.00
1.72 2.00 1.60 1.75 1.66	(3) Professional standards, autonomy & accountability Three-year full-time Four-year full-time In-Service programme Postgraduate Diploma Four-year part-time	1.49 1.41 1.58 1.83 1.77
1.98 1.83 1.59 1.91 1.83	(4) Therapeutic intervention skills Three-year full-time Four-year full-time In-Service programme Postgraduate Diploma Four-year part-time	1.80 1.50 1.64 1.83 2.00
1.94 2.00 1.66 2.00 1.87	(5) Theoretical and clinical reasoning Three-year full-time Four-year full-time In-Service programme Postgraduate Diploma Four-year part-time	2.00 1.87 1.93 2.00 2.16
1.98 2.25 1.75 2.00 2.00	(6) Research skills Three-year full-time Four-year full-time In-Service programme Postgraduate Diploma Four-year part-time	1.92 1.87 1.81 1.90 1.91
1.83 2.00 1.54 1.70 1.71	(7) Professional attitudes & behaviours Three-year full-time Four-year full-time In-Service programme Postgraduate Diploma Four-year part-time	1.72 1.42 1.67 1.74 1.71
2.01 2.33 1.71 2.16 2.00	(8) Service evaluation & risk assessment Three-year full-time Four-year full-time In-Service programme Postgraduate Diploma Four-year part-time	1.78 1.33 1.79 1.93 1.88

Hypothesis Testing Box 6

The Kruskal-Wallis one-way ANOVA was used to test the null hypothesis that there is no difference in the competency scores across all five types of occupational therapy education programmes within the employer data. The test was repeated for the graduate data.

Interpretation of results - no significant differences in the competency scores between the five different routes to gaining an occupational therapy qualification were observed in either the employer or graduate data. The null hypotheses were not rejected.

Level of academic award

The level of academic award earned by students at the end of their occupational therapy education programme may impact on levels of competence in practice. Table 21 shows how mature students are more likely to attain a higher degree classification than younger students. This mirrors the findings of Part 1 of the study -see Table 2.

TABLE 21. LEVEL OF ACADEMIC AWARD ACHIEVED BY AGE GROUP

Employer Responses n=72*		Level of Award on graduation	Graduate Responses n=99*	
Under 21 (n=32)	Over 21 (n=40)		Under 21 (n=42)	Over 21 (n=57)
1	4	First-class-honours degree 1 st	2	5
16	20	Upper-second-class honours degree 2:i	19	30
12	13	Lower-second-class honours degree 2:ii	19	16
3	0	Third-class-honours degree 3 rd	2	1
0	1	Unclassified or ordinary degree	0	1
0	2	Postgraduate Diploma -Pass	0	4

Missing Data - 3 graduate responses (2 age-related data, 1 award data) and 17 employer responses

Ratings of competence by level of award achieved

This analysis sought to explore if the level of academic achievement at university had an impact on the ratings of competency rather than age. Table 22 presents the mean competency scores for each level of award within the employer and graduate data. The data have produced some interesting findings in relation to level of academic award. Table 22 shows a hierarchy of employer ratings for the honours graduates across all eight scales. Employers consider graduates who qualified with first-class honours degrees to be the most competent of all honours degree-level graduates. The least competent honours graduate are those who obtained a third-class honours degree. The two postgraduate diplomates were rated in the middle of the range of competency scores, and the one non-honours graduate attained very high scores from his/her employer. The graduate data does not show as remarkable a trend, but a hierarchy can also be seen in the data for the top three tiers of the honours degree classification. A consistent trend is seen in how graduates rate their competence, with first-class honours degree graduates having the highest self-perceptions of competence, followed by those who gained an upper-second-class honours degree, and then followed by those that gained a lower-second-class honours degree. Interestingly, the three graduates who obtained a third-class honours degree consistently rated themselves as having self-perceptions of competence equal to or above those graduates who were awarded a first-class honours degree. Statistical testing of these findings are presented in Hypothesis Testing Box 7.

TABLE 22. LEVEL OF AWARD IN OCCUPATIONAL THERAPY EDUCATION BY MEAN SCORES

Employer mean scores (n=72)	Sub-Scale of competence	Graduate mean scores (n=101)
	(1) Professional development & reflection	
1.26	First-class-honours degree	1.40
1.75	Upper-second-class degree	1.60
1.86	Lower-second-class degree	1.72
2.44	Third-class-honours degree	1.44
1.00	Non-honours degree	2.00
1.66	Postgraduate Diploma	1.73
	(2) Work management skills	
1.40	First-class-honours degree	1.48
1.75	Upper-second-class degree	1.63
1.99	Lower-second-class degree	1.67
2.25	Third-class-honours degree	1.33
1.37	Non-honours degree	2.00
1.74	Postgraduate Diploma	1.75

Employer mean scores (n=72)	Sub-Scale of competence	Graduate mean scores (n=101)
	(3) Professional standards, autonomy & accountability	
1.36	First-class-honours degree	1.47
1.56	Upper-second-class degree	1.49
1.87	Lower-second-class degree	1.56
2.44	Third-class-honours degree	1.11
1.00	Non-honours degree	2.00
1.75	Postgraduate Diploma	1.83
	(4) Therapeutic intervention skills	
1.56	First-class-honours degree	1.66
1.86	Upper-second-class degree	1.78
2.12	Lower-second-class degree	1.84
2.16	Third-class-honours degree	1.55
1.16	Non-honours degree	2.00
1.91	Postgraduate Diploma	1.83
	(5) Theoretical and clinical reasoning	
1.45	First-class-honours degree	1.92
1.82	Upper-second-class degree	2.00
2.02	Lower-second-class degree	2.03
2.41	Third-class-honours degree	1.75
1.50	Non-honours degree	2.00
2.00	Postgraduate Diploma	2.01
	(6) Research skills	
1.50	First-class-honours degree	1.75
1.84	Upper-second-class degree	1.88
2.11	Lower-second-class degree	2.00
2.50	Third-class-honours degree	1.75
1.50	Non-honours degree	2.00
2.00	Postgraduate Diploma	1.90
	(7) Professional attitudes & behaviours	
1.54	First-class-honours degree	1.60
1.68	Upper-second-class degree	1.62
1.94	Lower-second-class degree	1.87
2.34	Third-class-honours degree	1.52
1.28	Non-honours degree	2.00
1.70	Postgraduate Diploma	1.74
	(8) Service evaluation & risk assessment	
1.73	First-class-honours degree	1.76
1.84	Upper-second-class degree	1.78
2.17	Lower-second-class degree	1.79
2.22	Third-class-honours degree	1.33
1.00	Non-honours degree	2.00
2.16	Postgraduate Diploma	1.93

Hypothesis Testing Box 7

The Kruskal-Wallis one-way ANOVA was used to test the null hypothesis that there was no difference in the distribution of competency scores between each of the six levels of award within the employer data. The test was repeated with the same hypothesis for the graduate data. Although a direct effect size score cannot be calculated for this non-parametric test, the formula $\eta^2 = \chi^2 / N-1$, suggested by Munro (1997) for an effect size index for Kruskal-Wallis has been used to show the large strength of association between the independent and dependant variables in these following analyses. The degrees of freedom were 5 throughout these tests.

Interpretation of results for the employer data

The results show a significant difference between the 6 levels of awards;

- ❖ Sub-scale 3 '*Professional standards & accountability*' $\chi^2 = 15.47$, $p = 0.009$, $\eta^2 = .21$
- ❖ Sub-scale 4; '*Therapeutic intervention skills*' $\chi^2 = 13.49$, $p = 0.019$, $\eta^2 = .19$
- ❖ Sub-scale 6; '*Research skills*' $\chi^2 = 13.13$, $p = 0.022$, $\eta^2 = .18$
- ❖ Sub-scale 7; '*Professional attitudes & behaviour*' $\chi^2 = 11.91$, $p = 0.036$, $\eta^2 = .16$
- ❖ Sub-scale 8; '*Service evaluation & risk assessment*' $\chi^2 = 11.32$, $p = 0.045$, $\eta^2 = .15$

The null hypotheses were rejected for five of the eight sub-scales, as the differences between the competency scores across the various levels of award were deemed to be statistically significant. Significance was maintained even when the analysis was confined to honours degree graduates, where the further analysis of the data showed the second sub-scale of competence as also being significant;

- ❖ Sub-scale 2; '*work management skills*' $\chi^2 = 9.29$, $p = 0.026$, $\eta^2 = .13$

Interpretation of results for the graduate data

The Kruskal-Wallis ANOVA was also used to test the null hypothesis that there would be no difference in means ranks of competence scores between each of the six levels of award within the graduate data. Results of this analysis found that only one sub-scale of competence showing significant differences between the six levels of award. Again this finding was enhanced when the analysis was confined to honours degree graduates only.

The null hypothesis was not rejected for seven of the eight sub-scales but rejected for

- ❖ Sub-scale 7; '*Professional attitudes and behaviour*' $\chi^2 = 13.99$, $p = 0.016$, $\eta^2 = .13$

MANOVA was also conducted using Bartlett factor scores as the dependent variables and age and level of award as the independent variables. No statistical effects or interaction effects were observed for the Wilks' Lambda statistic. See Appendix 5, section 2.

It can thus be concluded that level of academic attainment during occupational therapy education has a strong influence over employers' perception of the new graduates' abilities in the early years of professional practice. The descriptive presentation of the data showed that employers perceive those who qualified with higher honours degree classifications as being more competent in the clinical setting than those who qualified with the lower classification of an honours degree. These findings were confirmed by statistical analysis of significant differences between the levels of award. The final part of this chapter explores the length of time since qualification on perceptions of competence.

Year of qualification

The questionnaire asked respondents to indicate the year of qualification as it might be assumed that, the longer the length of time since qualification, the higher the level of competency. Although the majority of respondents (76%) qualified in 1999, comparisons in levels of competence were made with those who qualified in 1997 and 1998. The following analyses were based on the assumption that graduates had been working as occupational therapists consistently since graduation. Table 23 shows that the age distribution of subjects across the three years of qualification.

TABLE 23. YEAR OF QUALIFICATION

Employer responses (n=89)		Year of qualification	Graduate responses (n=99)	
Under 21 (n=40)	Over 21 (n=49)		Under 21 (n=42)	Over 21 (n=57)
28	39	1999	31	45
10	9	1998	9	11
1	1	1997	2	1

Missing Data on 3 graduate subjects (2 age data, 1 year data)

Ratings of competence by year of qualification

This analysis sought to explore if the year of qualification from university had an impact on the ratings of competency rather than age. Table 24 presents the mean competency scores for each qualification year within the employer and graduate data.

TABLE 24. YEAR OF QUALIFICATION BY MEAN SCORES

Employer mean scores (n=88)	Sub-Scale of competence	Graduate mean scores (n=101)
1.73 1.97 2.25	(1) Professional development & reflection 1999 1998 1997	1.62 1.61 2.05
1.84 1.94 2.43	(2) Work management skills 1999 1998 1997	1.65 1.57 1.50
1.67 1.81 2.25	(3) Professional standards, autonomy & accountability 1999 1998 1997	1.55 1.35 1.94
1.91 2.03 2.16	(4) Therapeutic intervention skills 1999 1998 1997	1.80 1.72 2.05
1.87 2.05 1.95	(5) Theoretical and clinical reasoning 1999 1998 1997	2.02 1.87 2.08
1.91 2.10 2.37	(6) Research skills 1999 1998 1997	1.93 1.81 2.08
1.77 1.87 2.14	(7) Professional attitudes & behaviours 1999 1998 1997	1.71 1.72 1.85
1.94 2.15 2.00	(8) Service evaluation & risk assessment 1999 1998 1997	1.79 1.66 2.22

Hypothesis Testing Box 8

The Kruskal-Wallis one-way ANOVA was used to test the null hypothesis that there would be no difference in distribution of competency scores between graduates that

qualified in 1999, 1998 or 1997. The test was carried out for the employer and graduate data separately.

Interpretation of results for the employer data

Although a trend is observed in the data, no significant differences were observed between the three years of qualification for all eight sub-scales of competence and this descriptive trend may have occurred by chance.

Interpretation of results for the graduate data

The results show a significant difference in the competency scores between the three years of qualification for 2 sub-scale but the η^2 for sub-scale 3 is small:

- ❖ sub-scale 3; '*Professional standards & accountability*' $\chi^2 = 6.92$, $p = 0.031$, $\eta^2 = .03$
- ❖ sub-scale 8; '*Service evaluation and risk assessment*' $\chi^2 = 16.23$, $p = 0.044$, $\eta^2 = .16$

Further post-hoc analysis of these significant findings indicated that the true statistical differences lies between the 1997 graduates and the other cohort years and not between 1999 and 1998 graduates. The null hypotheses were rejected for these areas of professional competence as the year of qualification was seen to have an impact on level of competence. The null hypotheses were not rejected for remaining six sub-scales, as any trends observed in the data were not found to be statistically significant.

df = 2, throughout all these tests

Employer ratings of competence by year of qualification

The lower levels of competence amongst the 1997 graduates are echoed in the employers' rating of this year group. Another trend was observed in the employer data, which suggested that employers rate the more recently qualified graduate as more competent. Employers rated the graduates of 1999 as being more competent than all other graduates in the study, however the statistical analysis of the employer data shows no significant difference between the year groups for any of the sub-scales of competence.

Graduate self-ratings of competence by year of qualification

Table 24 shows how graduates who qualified in 1998 perceive themselves as having greater levels of competency than graduates who qualified in 1999, which would concur

with the premise that length of time since qualification affects perceived levels of competence. However, this assumption is refuted by the ratings provided by the three graduates who qualified in 1997. These graduates rated their ability as lower than both other year groups except in work management skills where the graduates of 1997 felt they are more competent than more recent graduates.

This concludes the inferential analysis of the quantitative data but the research method also acknowledged the value of the subjective opinions of the participants in this study. Employers and graduates were invited to provide comments in an open free-text box at the end of the competency questionnaires. This narrative-type data provided a different perspective and insight into the respondents' personal views on the professional competence of new graduates in practice. The chapter concludes with the results of the narrative data analysis.

CONTENT ANALYSIS OF RESPONSES TO THE FREE TEXT, OPEN-ENDED QUESTIONS ON THE EMPLOYER AND GRADUATE QUESTIONNAIRES

The questionnaires sent to employers and graduates had, on the final page, a two-inch blank box where respondents were invited to provide the researcher with additional comments relating to the level of competence of newly qualified occupational therapists. Forty-two percent of employers who returned their questionnaires and 49.5% of graduates made comments in this box. These comments were analysed by using visual content analysis to categorise the data and gain an estimate of the strength of opinion within each emerging category or theme (Robson, 1994). The majority of respondents, who used this opportunity to comment, did so in line with the instructions on the questionnaire. However, two respondents used it as an opportunity to comment on the quality of the questionnaire, stating that the statements were too black and white and needed a middle category to indicate uncertainty about levels of competence. There were also positive comments about the value of the study and the comprehensiveness of the questionnaire. Table 25 below shows that more comments were made in relation to the issue of 'being equipped with the skills for professional practice' than any other issue. All emerging themes have been discussed and enhanced with quotations to illustrate the issues raised.

TABLE 25. SUMMARY AND FREQUENCY OF EMERGING THEMES ARISING FROM THE COMMENTS

THEME	Number of Employer comments	Number of Graduate comments
Need for supervision and support	8	13
Confidence and autonomy in decision making	9	16
Being equipped with the skills for practice; expectation versus reality	22	14
Benefits of life or work experience /gap year	4	7
Transition into practice	6	17
Continuing Professional Development (CPD) & rotational posts	5	7

Need for supervision and support

Employers and graduates commented that supervision was an absolute necessity for newly qualified staff. However, the issue that emerged from the variety of comments was that standards of supervision vary across posts. This was mostly due to pressures on senior staff to provide support to newly qualified occupational therapists. Employers saw supervision as very time consuming on senior staff if the new graduate needs a lot of support, and in these times of financial and time constraints, intensive supervision was not always feasible. One employer commented that

'newly qualified staff require support and supervision all the way through, they are not confident juniors'

and a graduate added that

'good and regular supervision makes all the difference but it is often reduced in time of staff shortages'.

Graduates expressed some resentment towards managers for reducing their level of support just when they were taking on more responsibility because of low numbers of staff. However, even with high levels of good quality supervision, some employers found that a small number of new graduates were still struggling. A number of employers commented that new graduates sometimes see supervision as a form of assessment and this inability to make the transition between the student and practitioner role is of concern to them.

Confidence and autonomy in decision-making

Employers and graduates stated that confidence was lacking initially in the transition from student to that of state registered practitioner. Both commented that the reality of dealing with the day to day issues of patient care, making decisions and accepting responsibility were daunting for newly qualified staff. Graduates commented that occupational therapy education did not fully prepare them for the realities of practice and the level of autonomy encountered in practice. With regards to age, one employer commented that the initial demeanour of confidence presented by a mature graduate in their department was masking an underlying lack of confidence but the need to be seen as competent was an important driver for this mature student. Another employer regretted that the questionnaire did not include confidence as an item to score.

Graduates also saw a link between competence and confidence, stating that it takes time for confidence to grow and competence to develop.

'It does take time for confidence to build and to feel proficient being an OT'

Being equipped with the skills for practice; expectation versus reality

The greatest number of comments was made in relation to this theme, with two parallel concepts dominating the responses. Employers felt that newly qualified occupational therapists need to be able to handle a busy caseload; accept professional responsibility and function autonomously, especially when staff shortages existed in a service. New graduates, they felt, had difficulties in accepting the reality of actual practice as compared to their ideal model of what practice should be. However one graduate commented

'from my own experience, it seems that the level of competence expected of newly qualified occupational therapists equals that of a more advanced senior II level, this may not be intentional but staff shortages and heavy caseloads do not endorse anything less'.

Other graduates commented about *'being thrown in the deep end'* or feeling *'out of my depth'*, where their expectations of themselves did not match with the realities of practice.

Employers felt that graduates have greater theoretical skills than clinical skills when entering practice, yet graduates did admit the need for more practical skill development in interventions with clients and a greater understanding of medical conditions before qualifying. A number of other comments were made in relation to the variability across universities and the strong influence of the student fieldwork placements on the level of competence of new graduates. Mature students had high expectations of their level of competence because of their life and work experience. The in-service students valued their experiences as occupational therapy assistants and felt prepared for the realities of clinical practice.

Benefits of life experience or a gap year after leaving school

As this study is looking at the influence of age on competence, the few comments made for this theme were particularly interesting to note. Employers and graduates saw life and work experience as impacting on levels of competence in practice.

A graduate who did not take a gap year states

'having entered training straight from 6th form college, I feel that having general life experience would actually have been beneficial in the initial stages [of training], and to a certain degree now in qualifying and practising as an occupational therapist'.

Few employers made comments in relation to mature age and life experience, which supports the quantitative finding of this study where no strong link between age and competence was observed in the data. But eight mature students commented on their maturity and life experience as contributing to their strong feelings of competence. Employers and graduates also noted the benefits of in-service education programmes.

One employer commented that

'an individual's life experience plus work experience [as an occupational therapy assistant] can be a significant positive factor for them settling into their first qualified post'.

Two employers did comment however, that their particular member of staff needed time to make the transition from being an occupational therapy assistant to being a fully qualified occupational therapist.

The transition into practice

The majority of respondents who commented were graduates rather than employers. Nine graduates commented that they felt unrealistic expectations on them given they had only been qualified a few weeks. Indeed, one employer commented they were expected to

'hit the ground running' and that 'reality is a shock to them'.

The quality of the work environment, how well the team function together and the individual traits of the therapist were also perceived to effect levels of competence. A number of graduates commented on the 'steep learning curve' experienced on entering clinical practice,

'I was not prepared for the huge jump between college and practice, I was 4 to 5 months in practice before I felt able to function competently independently'.

Other graduates said that excellent supervision and experience had helped them to make the transition from being a student to professional practitioner.

Continuing professional development and rotational posts

Employers and graduates made comments in relation to this theme. The graduates found that there were limited opportunities for continuing professional development in their posts, while others expressed dissatisfaction with the six-month rotational posts on offer to new graduates. They felt that these short-term posts did not provide enough time to implement the audit and research skills taught at university. Employers also commented on rotational type posts, saying that new graduates needed time to settle into each occupational therapy department and should be facilitated to transfer skills from one setting to another, as well as explore opportunities for continuing professional development. But graduates commented that opportunities were not provided for them because they rotated around the various posts so quickly within the yearly cycle.

The comments provided at the end of the questionnaires have added another perspective into the levels of competence displayed by new occupational therapy graduates in practice. The chapter now concludes with a summary of the main finding of the data analysis.

SUMMARY OF RESULTS CHAPTER

This chapter has examined and interpreted the data collected in this study. The analysis of age and academic performance in occupational therapy education initially provided a picture of mature student success but the data were strongly influenced by the superior academic performance of the students who had a previous degree on entry to occupational therapy education. The second part of the study investigated the impact of age on the early professional performance of recent occupational therapy graduates using a competency questionnaire. Factor analysis was used to reduce the data into 8 meaningful sub-scales of competence. Employers and graduates alike had graduate competency scores located in the lower, more competent end of the rating scale. This echoes the findings of Barnitt and Salmond (2000) who also found that graduates were competent on entering practice. The competency data were then analysed for age-related differences. This inferential analysis of the data showed that the hypotheses of age as a value-added factor in the early professional performance of graduates was partially upheld in the graduate self-ratings but not in the employer ratings of the new graduates in practice. No age differences were observed in the employer ratings of graduate abilities but the level of degree classification achieved in occupational therapy education was related to how employers rated the level of competence of new graduates. In general, they perceived graduates who qualified with higher honours degree classifications as being more competent in the clinical setting than those who qualified with the lower classification of the honours degree hierarchy. When graduates rated their self-perceived levels of competence, it was the mature graduates who consistently rated themselves as having higher levels of competence. The length of time since qualification or the types of programme undertaken were not seen to relate strongly to either the employers' or new graduates' ratings of competence. The comments provided at the end of the questionnaire highlighted a discrepancy between the expectations of competency of employers and the graduates' expectation of themselves.

The next chapter synthesises the results of the quantitative data analysis and the narrative comments, and compares them to the body of research evidence presented in the literature review.

CHAPTER 5 DISCUSSION

INTRODUCTION

This chapter will discuss the findings of this research study by looking at the similarities and differences between this study's results and the published literature cited in Chapter Two. The research questions are answered and the emerging results will now be interpreted relative to their unique contribution to the body of research evidence in healthcare education. The chapter will conclude by critically reviewing the strengths and limitations of the data collection methods used in this research study.

DISCUSSION OF DATA ANALYSIS

This research study aimed to explore if student age on entry to occupational therapy education was a predictor of success in the academic outcome and early professional performance of recent occupational therapy graduates. The study was divided into two parts, each addressing a separate component of this overarching aim.

Part 1 of the study collected data from eight occupational therapy programmes to answer the first research question of the study;

1. Do mature students in occupational therapy programmes across England and Wales perform better academically than their younger peers at the point of exit from the programme?

This analysis of age and academic performance in occupational therapy education initially provided a picture of mature student success, supporting the hypothesis that age was a predictor of higher levels of academic performance in occupational therapy students. The variable of entry qualifications were then added to the analysis as the literature indicated that this measure of previous academic ability can have an impact the academic performance of students in healthcare education programmes (Kerr, 1995; Nayer, 1992; Payton, 1997; Schmaltz et al. 1990). The statistical analysis of the data, using a two-way ANOVA, found that the statistical significant effect of mature age on academic performance was negated when entry qualifications were added to the analysis. The data analysis showed a significant statistical relationship between entry qualifications and the academic performance of occupational therapy students. Further exploration of the data indicated that the mature student data were strongly influenced by the superior academic performance of the students who had a previous degree on

entry to occupational therapy education. When these 70 degree-entrants were removed from the age analysis, the academic performance of the remaining 184 mature students did not differ statistically from that of the 171 younger students.

This finding is contrary to general education evidence of the previous two decades, which has shown that the older age group of students consistently perform as well or better than their younger peers in higher education (Hartely et al., 1993; Hoskins et al., 1997; Lucas & Ward, 1985; Richardson, 1995; Simonite, 1997; Smithers & Griffin, 1986; Walker, 1975). Within the more specialised field of healthcare education, few researchers have directly analysed the impact of age on academic performance. Although Johnes (1992) did find that mature students performed particularly well in vocational-type courses, the evidence to support a link between age and academic performance in healthcare education is weak. In occupational therapy, Schmaltz et al. (1990) found that student age at the start of education had no significant impact on subsequent academic performance. Although Howard and Watson (1998) did find a moderate relationship between age and academic performance, this was only evident in the early part of occupational therapy education. With the exception of McManus and Richards (1986), the evidence from the medical and physiotherapy education research literature also upholds the weak correlation between age and academic performance (Neame, et al., 1992; Rolfe et al., 1995; Payton, 1997).

Meanwhile, the superior academic performance of the students in this study who entered occupational therapy with a previous degree is supported by Green and Waterfield's (1997) study of physiotherapy students and Montague and Odds's (1990) research on medical students. The North American occupational therapy literature also showed previous academic endeavour to be a predictor of superior performance in occupational therapy and physiotherapy education (Kirchner & Holm, 1997; Posthuma & Sommerfreund, 1985).

Part 1 of this study concluded that student age on entry to occupational therapy education is not predictive of greater academic success than that of younger occupational therapy students. This refutes the hypothesis that life or work experience are definitive age-related factors which can influence academic achievement in professional education. The analysis of the data for entry qualifications found that students who entered occupational therapy education with a previous degree had greater

levels of academic success than all other students. This finding could be explained by the previous-degree entrants familiarity with the university environment and the demands of degree level study, but the question still remained; does academic performance predict better clinical performance after graduation?

Pedagogic researchers in healthcare acknowledged the need to also answer this question (Green & Waterfield, 1997; Kerr, 1985; Scott et al., 1995). Part 2 of this research study investigated the impact of age on the early professional performance of a sample of occupational therapy graduates. The second part of the study used a graduate competency rating scale, embedded in a postal questionnaire, sent to a sample of clinical occupational therapy departments in NHS trusts located in South of England. The questionnaire data were used to answer the second and third research questions of the study;

2. Do employers perceive a difference between mature and young graduates, as measured by an occupational therapy graduate competency rating scale?
3. Does the age of the graduate have an impact on their perceived level of professional competence as measured by the graduate competency rating scale?

The hypotheses that age has an influence on levels of threshold competence after graduation was partially upheld in the graduate self-ratings data but not in the employer ratings of new graduates in practice. The construct of competence was measured using competency statements modified from the list of core-skills, behaviours and abilities required of a graduating occupational therapy student in order to be eligible for state registration as an occupational therapist in the UK (COT, 1998). The core-skills, behaviours and abilities were translated into 46 positively worded competency statements that could be rated for ability using a four-point scale, which included a category for skills that were considered not applicable in that clinical setting. Using the process of Factor Analysis, the data were reduced into eight factors. Each of these factors was tested for internal consistency and discriminant validity. This analysis showed all eight factors to be reliable, valid and independent sub-scales of competence in occupational therapy.

The ratings provided by the employer and graduates were analysed separately because they were returned independently to the researcher as unmatched data. This decision not to compare the graduate and employer data was endorsed by the low study response

rates; 35% in employer sample and 30% in the graduate sample. There was no guarantee therefore that the questionnaires returned from the graduates were linked to those returned from their employers, so any direct comparison between the ratings of competence from these two groups would be erroneous. Indeed, studies that have used fully matched data have obtained contrasting results. Woolliscroft et al. (1993) found that medical students' self-ratings of clinical performance did not correlate with residents' ratings of their ability, leading the authors to conclude that self-perceptions of ability are influenced by a number of factors, such as confidence and self-image. Yet, Bartlett et al. (2000) found a high degree of concordance between new graduates' self-rating of competence and their individually matched supervisor ratings.

Employers' perceptions of new graduates in practice

Although employers considered all new graduates to be competent in practice, they consistently rated mature graduates as more competent than younger occupational therapy graduates. However, the difference in mean competency scores between the two age groups did not reach a level of statistical significance for any of the eight sub-scales of the measure. This lack of statistical significance in the findings could mean that the higher ratings for mature students occurred by chance and in fact employers perceive the level of competence displayed by mature students as being no different than all other graduates, which concurs with Barnitt and Salmond (2000). Alternatively, a Type II error could have occurred in this statistical analysis and a sample, larger than the 89 employer respondents in this part of study, might have shown a significant age effect in the employer data. Furthermore, these results stand in isolation in the literature as no other occupational therapy studies were found that looked specifically for age differences when canvassing employers' perceptions on how recently qualified occupational therapists perform in practice. The literature does explore other variables that can influence employers' perceptions of graduate performance (Bartlett et al., 2000; Kenyon & Ilott, 1997). Accordingly, the employer data were compared to the type of education programme undertaken, the length of time since qualification and the level of academic award achieved to see if these variables, not age, had an impact on how employers perceive new graduates in practice.

The analysis of the data showed that type of education programme undertaken by graduates was not related to ratings of competence. Although employers did rate graduates from in-service courses as the most competent in seven out of the eight sub-scales, this finding was not statistically significant. This descriptive trend in the ratings, although not significant, corresponds with Kenyon and Ilott's (1997) study of occupational therapy graduates, where employers commented that in-service trained occupational therapists was more confident, and had greater clinical skills, than those graduating from a full-time occupational therapy courses. The nursing literature also concurs with this finding in showing that associate nurses, who subsequently train to degree level, displayed the highest levels of competence in nursing practice (McCloskey, 1983).

The data showed that the length of time since qualification was not statistically significantly related to employer ratings of competence, however, statistically significant results did occur when the rating of competence were compared with level of academic achievement attained by graduates in their occupational therapy education. A hierarchy of ratings for the honours degree graduates existed across all 8 sub-scales of the employer ratings. Employers considered graduates who qualified with first-class honours degree to be the most competent of all the honours graduates, the least competent honours graduate were those who obtained a third-class honours degree. The difference in ratings was statistically significant for six of the eight sub-scales of competence. However, it must be acknowledged that employers were first asked to identify the degree classification of the graduate before completing the competence rating scale part of the questionnaire. The potential bias of a halo effect may have influenced the employer ratings, where a first-class honours graduate might be expected to perform well in practice, with lesser expectations being set for the third-class honours graduate.

It must also be remembered that in some universities the scores achieved during undergraduate fieldwork practice make a sizeable contribution to the final academic average and degree classification (Westcott & Rugg, 2001). Indeed, previous research has shown that the removal of fieldwork from the final academic average resulted in a lower degree classification for 15% of graduates from one occupational therapy programme (Shanahan, 1995). Although Part 1 of the study did find that fieldwork accounted for 25% of the academic average, the competency questionnaire in Part 2 did

not ask for the percentage contribution of fieldwork to the final academic award. Therefore, it was not possible to take account of this potential confounding variable in the analysis of the data.

Notwithstanding these caveats, the study does provide evidence of a relationship between academic performance at university and levels of professional competence after graduation. This relationship has also been found in the medical education literature, (Blacklow et al., 1993; Pearson et al., 1998), leading Norman (1991) to conclude that medical students who perform well or poorly in examinations seem to perform to similar standard in the clinical practice setting. However, it must be acknowledged that other studies of medical students have found a more moderate relationship between undergraduate achievement and clinical performance after graduation (Markert, 1993; Norcini et al., 1987).

None of the occupational therapy literature that canvassed employer opinion on new graduates looked at academic performance at university and its possible influence on levels of performance in the workplace. However, the relationship between academic performance at university and grades achieved on occupational therapy fieldwork practice as a student has been explored, albeit with mixed results. US researchers found a weak correlation between these two variables (Best, 1994; Kramer & Stern, 1995), but a more recent British study did find a moderate relationship ($r = 0.56$) between the academic and the fieldwork performance of occupational therapy students (Howard & Jerosch-Herold, 2000).

New graduates' self-perceptions of competence to practice

The third and final research question asked if the age of the graduate had an impact on their self-perceived level of professional competence. Graduates, irrespective of age, perceived themselves to be competent in practice, but mature graduates consistently rated their skills as more competent than graduates who were under of 21 years of age on starting occupational therapy education. This age difference reached the level of statistical significance for three of the eight sub-scales of competence, namely, '*theoretical and clinical reasoning*', '*research skills*' and '*professional attitudes and behaviours*'. The literature that investigated new graduates' perceptions of their ability in practice has not specifically addressed the issue of age, so comparisons between this study's findings and the body of research evidence are limited. Nevertheless, the

statistically significant findings of this study are explored in an attempt to explain why mature students consider themselves to have greater levels of ability than their younger peers in some areas of professional practice.

These statistically significant findings may be linked to the phenomenon observed in Part 1 of this study, where having a previous degree on entry to occupational therapy education was a more dominant factor in the results than the variable of age alone. A number of students in the mature student group would have entered occupational therapy with a previous degree and this may go some way to explaining greater self-perceptions of competence in *'research skills'* and *'theoretical & clinical reasoning skills'*, as these are skills that are developed in many undergraduate degrees. Unfortunately, the competency questionnaire did not ask about entry qualifications, so it was impossible to isolate the mature students with a degree from the rest of the mature student sub-group to see if having a previous degree predicted greater perceptions of competence. The medical literature shows that having a degree on entry to medicine correlates with superior performance in the pre-clinical part of medical education but no correlation was found between graduate entry status and subsequent skills in clinical practice (Montague & Odds, 1990). The occupational therapy literature underpinning this study did find some evidence to support the link between having a degree and enhanced skills in research and critical thinking. But these studies cited below are North American in origin and as such do not equate with bachelor's and master's-level education in the UK (Waters, 2000). Rogers et al. (1988) compared the professional activities of occupational therapists with different education backgrounds and found that master's-level graduates were more likely to be involved in leadership and research activity than bachelor's-level graduates. However, no significant difference was found in their ability to engage in advanced clinical practice skills. Hayes-Fleming and Piedmont (1989) also found that bachelor's-level graduates felt less prepared in the area of critical thinking and aspects of professionalism, but all graduates, irrespective of education route taken, felt unprepared for the realities of clinical practice. Indeed, Allen et al. (2001) who argued for masters'-level only education on the basis that occupational therapy students with a previous degree will be more competent to provide for the healthcare needs of their clients after graduation, have little by the way of supporting evidence to underpin their argument.

The higher perceived ability of the mature students in this study for '*professional attitudes and behaviours*' may be linked to previous experience in the work environment and the variety of life experiences that these older students bring to clinical practice (Challis, 1976, Edwards, 1990; MacDonald & Stratta, 1998). A small number of mature graduates commented at the end of the competency questionnaire that they felt their maturity and life experience contributed to feelings of competence in practice settings. Indeed, this familiarity with the expectations of the workplace has been highlighted as one of the strengths of the in-service course, where occupational therapy assistants, who trained to be qualified occupational therapists, were considered to be competent practitioners, adapting well to the workplace, and exhibiting maturity, resourcefulness and confidence in practice (Alsop, 1996; Kenyon and Ilott, 1997). These studies point to the type of education programme undertaken as having a potential impact on levels of perceived competence.

Consequently, the analysis of the competency data collected from graduates in this study was broadened out to examine the potential confounding effect of the educational route taken to train as an occupational therapist on self-ratings of competence. The results of this analysis, however, showed no descriptive or statistically significant differences in graduates' self-ratings of competence for those who took a full-time course or those who took the part-time or in-service or post-graduate diploma route.

The level of academic achievement sustained in occupational therapy education, which was statistically significant in the employer data, was also explored within the graduates' self-ratings of competence. A similar, yet non-significant, hierarchy to the employer ratings of competence was observed in the first three tiers of the honours degree classification. Interestingly, the small number of graduates who qualified with a third-class honours degree rated themselves equal to or above those who achieved a first-class honours degree. This illustrates the subjective influence of self-perception on ratings of competence found by Woolliscroft et al. (1993), who interpreted the inverse relationship found in his study as a possible defence mechanism used by medical students who had lower levels of academic ability than their peers. Stewart et al. (2000) also warned that self-evaluation measures can be influenced by self-confidence and a belief in one's self that may or may not equate with actual ability. This highlighted the need for corroborative evidence from employers in this investigation of new graduates' abilities in practice. (Hummell & Koelmeyer, 1999).

Finally the length of time since qualification was compared to the graduates' self-ratings of competence. No significant differences were observed between the ratings of graduates who qualified in 1998 and those who qualified in 1999. However, in seven of the eight sub-scales of the competency measure, the three graduates who qualified in 1997 reported lower levels of competence than those graduates who qualified in the years 1998 and 1999. These differences reached the level of statistical significance for *'professional standards, autonomy and accountability'* and *'service evaluation and risk assessment'*. The 1997 graduates rated themselves as having higher levels of competence in only one area, namely *'work management skills'*. This length of qualification effect is not surprising as new graduates commented at the end of the questionnaire that managing a busy caseload and work management were skills they lacked initially and only developed over time. The literature also supports this finding (Atkinson & Steward, 1997; Parker, 1991). The difference in ratings between the graduates who qualified in 1997 and all other year groups could be due to the intentional ambiguity of the term 'recently qualified' used in the covering letter to occupational therapy managers. This may have introduced an element of selection bias into the study where some occupational therapy managers might have selected less competent graduates who qualified in 1997 to participate in the study. Other managers, who had more able graduates from the same year, might have considered that graduates of the year 1997 were not 'recently qualified' and did not select these employees for inclusion in the study. The lower ratings of competence provided by the 1997 graduates may reflect this selection bias in the sample and not be a true representation of the ability of all graduates of 1997. Moreover, the low numbers in the sample from those graduating in the year 1997 implies the data should not be seen as theoretically significant.

Levels of competence - expectations of employers and graduates

The ratings of competence for the employer and graduate data were not matched and therefore not directly compared, but the narrative data provided as comments at the end of the questionnaires illustrated an articulated disparity between the expectations of employers and the lived experience of new graduates in clinical practice. This finding cannot be ignored. Employers acknowledged the need for supervision and support in the early years of professional practice, but had an expectation of levels of competence that

were driven by the realities of low staffing levels and pressure on clinical services within the NHS. Graduates, on the other hand, acknowledged that these high expectations of competence were being driven by external factors, but none the less were, experiencing stress in making a smooth transition between being a student and being a qualified practitioner; in some cases feeling overwhelmed by the realities of practice. Indeed, the suggestion of one employer that new graduates work in a supernumerary capacity for the first year has been echoed by Waters (2001) when she suggested a 6 to 12 month mentor-supported internship model for occupational therapy.

Graduates commented that the burden of decision making, autonomy and the level of responsibility caused them stress, but this was helped by regular supervision and support. The literature, investigating employers' views and the graduates' lived experience on making the transition between university and clinical practice upholds these narrative findings. The literature shows that new graduates can provide effective occupational therapy intervention, feel competent in the execution of frequently used assessment and treatment techniques but feel less competent in atypical situations (Atkinson & Steward, 1997; Rugg, 1996). The importance of regular and supportive supervision is also endorsed in the literature (Allen & Crickshank, 1977; Hayes-Fleming & Piedmont, 1989; Parker, 1991).

Employers commented that they expect graduates to 'hit the ground running' and be able to handle a busy caseload. They felt that new graduates seem to have greater theoretical skills than clinical skills on entering practice. These findings are mirrored in Huebler's (1994) interviews with US hospital administrators and experienced practitioners, where recent graduates were seen to be lacking in practical clinical skills and had difficulties working as part of an interdisciplinary team. The need for new graduates to function well in inter-disciplinary teams is echoed in the British literature (Barnitt & Salmond, 2000), the Australia literature (Adamson, et al., 1997) and the Canadian literature (Tryssenaar & Perkins, 2001). Yet, the issue of inter-disciplinary working did not emerge as an area of concern for either employers or new graduates in this study. This could be due to location and date of the study, as an increasing number of occupational therapy programmes in the UK offer inter-disciplinary teaching to promote insight and communication amongst professional groups at an early stage of a healthcare career.

This discussion of the literature and the research findings shows clear differences in expectation between employers and new graduates, highlighting the need for explicit standards of competence for new graduates entering practice (Barnitt & Salmond, 2000). The introduction of the subject benchmarking statements for occupational therapy may go some way towards alleviating these discrepancies in expectation (QAA, 2001).

SUMMARY OF THE DISCUSSION OF THE RESULTS

This original study investigated age as a predictor of success in the academic performance and early professional performance of new occupational therapy graduates in practice, and concludes that student age on entry to occupational therapy education, in isolation of other factors, is not a strong predictor of success.

The study proposes that the type of entry qualifications and not student age on entry, have an impact on levels of academic performance in occupational therapy education. However, the factors influencing levels of early professional competence are more complex and were compounded by a low response rate for the study.

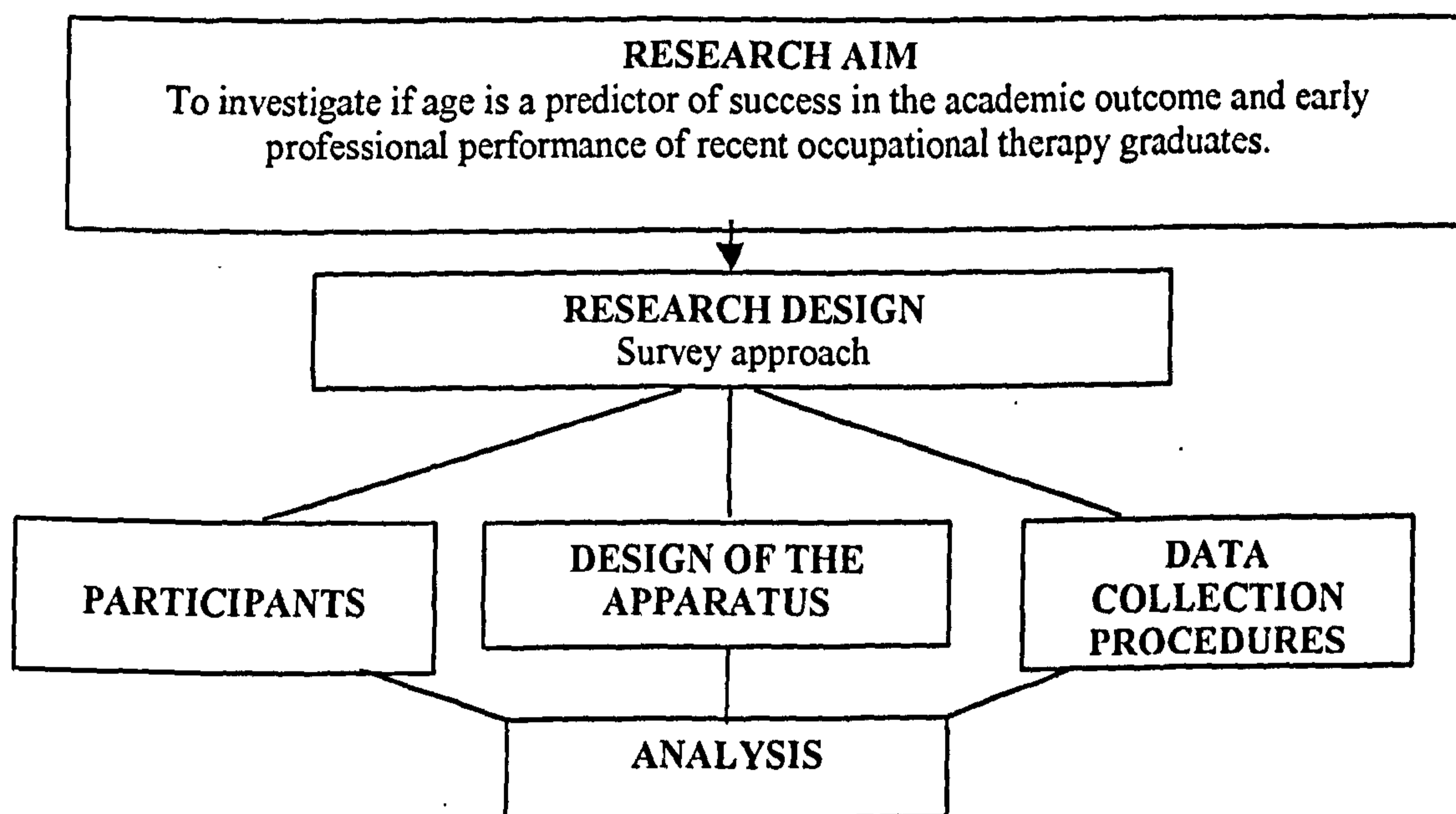
Employers' ratings of graduate competencies were not related to the age of the graduate but were linked to how graduates had performed academically during their occupational therapy education. This link between academic and clinical performance is supported in part by the medical education literature. Age was seen to be a factor in the graduates' self-ratings of competence, where mature students had higher perceived ability in three of the eight sub-scales of professional competence in the questionnaire. This finding is echoed in the narrative data where mature students valued their life and work experience as contributing to enhanced feelings of competence.

A number of factors in the design and implementation of the study may have influenced the validity of these outcomes thus necessitating a full discussion of the research method. This is presented in the remaining part of this chapter.

DISCUSSION OF THE RESEARCH METHOD

This chapter will conclude by critically reviewing the strengths and limitations of the research method used in this study. Although the study had one overarching aim, it consisted of two discrete studies, each addressing a separate aspect of the study's aim. The research process flow chart presented in Chapter Three will be used to structure this discussion on the effectiveness of the research method implemented.

FIGURE 7. RESEARCH PROCESS CONDENSED FLOW CHART



Research Design

The research design for Part 1 of the study was a postal survey to 19 occupational therapy schools across England and Wales. This proved to be a quick and effective way to gather data from the wide geographical spread of universities, as evidenced by the 63% response rate to this part of the study. Part 2 of the study also used a postal questionnaire to collect data on levels of professional competence shown by new graduates both from the employers' and the new graduates' perspective. Although the survey approach, using a global rating scale of competence, facilitated access to a wide selection of respondents, alternative approaches might have resulted in a higher overall response rate than the 46% achieved for this second part of the study. On-site visits with interviews with employers and observation of graduates in practice were considered but

the cost, in terms of researcher and respondents' time, far outweighed the benefits that direct contact or on-site observations would have provided. However, observation of practitioners in the clinical practice settings would have provided an element of inter-rater reliability in measuring competence which was lost by using a sample of different employers to rate the ability of their individual employees. Prior testing of the inter and intra-rater reliability of the competency measure may have highlighted these biases in advance but would not have removed the subjective effect of human judgement from the final ratings. Therefore, the human failings of prejudice, stereotyping and bias prevalent in supervisor ratings, widely recognised in the competency-based literature, are acknowledged in this study (Ashworth & Saxton, 1992; Hager et al., 1994). The great advantage of using employer ratings over researcher led observations was the extended period of time that employers had to consider the real-life competencies of their employees. This reduced the possible Hawthorne effect associated with any one-off interviews or observations carried out by a researcher (Elstein, 1993; Norman, 1991). Ilott and Murphy comment that 'work-based staff are in an ideal position to appraise the integration of knowledge, skill and ethical professional conduct in real naturalistic settings' (1999, p.27).

Participants

The sampling frame for Part 1 of the study was the total population of occupational therapy schools in England and Wales offering a three-year, full-time BSc (Hons) Degree in Occupational Therapy. Schools in Scotland and Northern Ireland were excluded, as were the occupational therapy programmes that offered a two-year accelerated occupational therapy diploma programme. The rationale for these exclusions was an attempt to standardise the sample and explore only comparable student data from the same length of degree course. These exclusion criteria have therefore limited the external validity of the findings to a discrete sub-set of the occupational therapy student population.

The sampling frame for Part 2, the competency questionnaire to employers and graduates, was a non-probability sample of 4 selected NHS Regional Health Authorities located in Southern England. It was hoped that the notoriously low response rate for surveys (Stein & Cutler, 2000) might be enhanced by using NHS hospital and community trusts that provide fieldwork placements for occupational therapy students at

the researcher's host university. Unfortunately, this strategy was not proved to be successful, as the total response rate of 46% was lower than expected. In retrospect, a similar sized probability based sample could have been obtained using cluster sampling and this would have ensured a random selection of NHS trusts throughout the UK and thus had greater external validity. Local Authority Social Services occupational therapy departments would also need to be adequately represented in any future study of this kind.

Design of the apparatus

The data collection tools used in this study were postal questionnaires that were piloted within the confines of one university before national implementation in this study.

Part 1 - questionnaire to occupational therapy schools

The questionnaire to occupational therapy schools asked for general information relating to the entry qualifications for 1996 and anonymous data on the graduating cohort of 1999. The age at entry, entry qualifications and the numerical academic average used to calculate the final degree classification was requested for each graduate entered on the questionnaire. The data were analysed using this numerical average to compare the academic performance of mature and young university entrants. Entry qualifications were also included in this analysis. An assumption was made that all students would have met the minimum general entry requirements so, for example, all A-level entrants could be regarded as equal and considered as one discrete group. However, this assumption may have been invalid, as it is now known that many occupational therapy schools accept candidates with grades below the specified entry criteria during the summer 'clearing' period, in order to fill any remaining places on their courses. Yet, it is unlikely that this added knowledge would have changed the results of the statistical analysis, as having a previous degree on entry to occupational therapy was the variable that had a major impact on academic performance in occupational therapy education, not A-level entry status.

The questionnaire to occupational therapy schools asked if the fieldwork component of the course was included in the final degree academic average and if so, its percentage weighting. This information was recorded but not used to make any modification to the academic averages provided by the various schools. A purer measure of academic

ability would have been achieved had the academic average for each graduate been mathematically adjusted for its percentage contribution of fieldwork. The failure to adjust the academic averages in this manner has led to a lack of parity in the data across schools, a problem that has been identified in education literature and also in the narrow field of occupational therapy education (Westcott & Rugg, 2001; Woolfe & Turner, 1997).

Part 2 - competency questionnaire to employers and graduates

The 46 core-skills, behaviours and abilities required of a graduating occupational therapy student listed in the curriculum framework for occupational therapy (COT, 1998) were used to inform the content of the competency rating scale embedded in the questionnaires to employers and graduates. Each of competency statements was rewritten as a positively worded statement. Respondents were asked to rate their level of agreement with each statement using a four-point Likert scale. The polar ends of the scale were worded as 'strongly agree' and 'strongly disagree'. There was also provision to tick a box saying that a statement was not applicable in that specific clinical setting. It was felt that a four-point Likert scale would provide greater sensitivity in measuring differences in levels of competence than the dichotomous type measure similar to that used in the survey of occupational therapy graduates by the College of Occupational Therapists (COT, 1995). The COT study asked respondents whether they felt equipped to practice after graduation and although the majority ticked 'Yes' (91%), many felt it necessary to comment on the limits of their competence with 'Yes, but.....' type statements. This need to elaborate on the answer was seen as indicative of the respondents' desire for a more sensitive measure similar to that used by Adamson et al. (1997) in their Australian study to investigate how prepared health science graduates felt for the workplace. They used a seven-point scale that included a 'not sure' category for graduates to tick if in doubt as to whether a particular skill or task had been covered in the university courses. The use of this 'not sure' category was justified in the Australian study as curricula can differ across universities. The intentional omission of a middle 'not sure' category in the current study was seen as appropriate as graduates are expected to achieve at least a basic level of competence in the core-skills, behaviours and abilities listed in the curriculum framework document. Although it is recognised that recent graduates may not have developed the skills of self-evaluation, employers were expected to have an ability to judge competence from incompetence, as there is no place

for ambiguity when determining fitness for practice from an assessors perspective (Ilott & Murphy, 1999).

The core-skills, behaviours and abilities listed in the COT curriculum framework document represent the nationally agreed standards of threshold competence at the time of data collection in this study (COT,1998). However, the content validity of these statements, or indeed the more recently published QAA subject benchmarking statements for occupational therapy, have yet to be tested (QAA, 2001). Both sets of competency statements were developed using expert opinion and documentary analysis but were not subjected to field testing in occupational therapy practice settings as recommended by Jessup (1991). British threshold standards for occupational therapy could be validated using a model similar to that used by the Australian Association of Occupational Therapists, the Australian nursing profession, or the American Occupational Therapy Association (AAOT, 1994; Dunn & Cada, 1998; Percival et al., 1994). This important second step in the development of threshold standards for occupational therapy in the UK needs to be implemented. Indeed, this modest research project has shown that two skill statements from the list of 46 competencies are generally less applicable than the other statements; '*Group work skills*' was rated as non-applicable by 31% of the employer and graduate respondents. '*Health promotion and education*' was shown to be isolated from the inherent sub-constructs of competence that emerged from the respondents' ratings. These findings warrant further investigation as to whether these skills are a true reflection of the core-skills and behaviours required for fitness to practice as an occupational therapist. However, despite the limitations of the curriculum framework statements, they did provide the only national standard for threshold competence in occupational therapy available at the time and, as such, are justified in their use in the competency questionnaire. The only alternative would be a list of skills generated by the researcher or the use of standards or competency statements for occupational therapy from another country (Searle, 2000).

Data collection procedures

Each clinical occupational therapy department within the identified 190 NHS Trusts in the sample was sent an envelope that included a covering letter, one or more employer questionnaires and graduate questionnaire pack(s). The covering letter requested that employers distribute the envelope labelled 'graduate questionnaire' to any recent graduates in the department, who would then return the questionnaire independently to

the researcher. In hindsight, this strategy introduced an element of distribution bias into the data collection procedures of the study, as employers were now the gatekeepers of the graduate respondent sample. As stated earlier in this discussion, the instruction to distribute the questionnaire to only recent graduates may have also introduced employer selection bias into the study, as the term 'recent' was not clearly defined. An alternative strategy might have been to recruit the graduates directly via lists provided by the occupational therapy schools and eliminate the need for employers to distribute the questionnaire to their employees. This would also have maintained the anonymity of the graduate respondent, which was deemed essential to achieve a high response rate in the study. Indeed, this strive for full anonymity had the major disadvantage of not providing fully matched data from the employer and graduate respondents and therefore no direct comparison could be made between the ratings provided by these two groups.

In this study the data were collected simultaneously from the occupational therapy schools and the employer and graduates in clinical practice settings. If the data from occupational therapy schools had been collected in advance, then the important finding indicating the strong effect of entry qualification on academic performance would have emerged and this variable could then have been included as a question in the competency questionnaire. It would have been interesting to explore the impact of having a previous degree on performance in the practice setting after graduation or to explore the effect of vocational entry qualifications on performance in practice.

Finally, the high non-response rates for Part 2 of the study needs to be discussed. The covering letter to occupational therapy employers instructed them to return the pack even if there were no recent graduates in the occupational therapy department. This strategy was instigated to minimise non-response and ensure that all questionnaires were returned to the researcher. However, only a small number (13%) of uncompleted questionnaires were returned, which combined with the useable response percentage of 33%, means that 54% of the questionnaires sent out were not returned at all. The instructions for return of the questionnaires were located at the end of the third paragraph of the covering letter to employers – see Appendix 2. Some employers may have read the first few lines of the letter and, seeing the study was not applicable to them, disposed of the letter and enclosed questionnaires, not reading far enough down the letter to follow the guidelines for return. Other employers may have consciously

decided not to participate and for their own reasons elected to disregard the instructions for return of the questionnaires.

The letters to occupational therapy employers were addressed generically to each occupational therapy manager within a NHS Trust and this impersonal approach may have resulted in a lower response than if the letters had been sent to named individuals. The managers were also informed that the questionnaires were uncoded and some may have deduced that non-responders were unidentifiable so reminders would not be forthcoming. These aspects of the data collection procedures may have distanced the researcher from the respondents to the extent that only those interested in the topic of investigation were sufficiently motivated to respond. If the study were repeated these important elements of non-response bias would need to be resolved before the distribution of questionnaires.

Analysis

The data collected in this research study were primarily numerical and analysed using statistical analysis techniques. However, asking respondents to make narrative comments at the end of the questionnaires counterbalanced this quantitative approach and provided an opportunity for triangulation. The narrative comments were analysed using visual content analysis, coded and presented descriptively under separate themes. The richness of data that emerged from this part of the study proved to be a successful strategy in providing an insight into differences in expectations of competence between employers and graduates; data that could not be captured by the quantitative questions.

The mathematical characteristics of the quantitative data differed between Part 1 and Part 2. This necessitated the use of different statistical analysis techniques for each part of the study. The data were normally distributed in Part 1 but this was not the case for Part 2 where bi-modal, skewed and leptokurtic distributions were observed, necessitating the use of non-parametric statistics to analyse the competency data. The greatest limitation associated with the use of non-parametric statistics is their inability to explore the simultaneous effect of more than one independent variable on the dependent variable under review. The advantage of using parametric statistics in Part 1 is illustrated by the use of a two-way ANOVA in analysing the schools' data, where results showed that success in occupational therapy education was determined by the type of entry qualification not the age of the student. This test is not available in non-

parametric statistics so the competency data analysis was limited to exploring the impact of single variables on the competency ratings scores. This explains why the data in Part 2 may seem to be 'overworked' in the attempt to achieve comprehensive analysis of what factors, other than age, might be associated with higher levels of competence.

The conclusions reached in this research study are based primarily on the results of the statistical analysis of the data. Each of the research questions were reworded as a null hypothesis and tested using the appropriate parametric or non-parametric techniques. The level of significance was pre-set as $\alpha = p < 0.05$ and all results interpreted as significant if they fell below this 5% cut off point. Any results that failed to meet the α criterion were deemed to have occurred by chance thus negating any further meaningful conclusions to be drawn from the data. This positivist approach to data analysis has been challenged, not least for the fact that hypothesis testing errors (Type I and Type II) can occur (Atkins & Jarrett, 1979). Thus, the chapter of results incorporated tables of descriptive statistics and an analysis of the narrative data to counteract these mathematical constraints. The discussion of the results also drew attention to any interesting yet non-significant statistical trends that arose in the data and compared them to the body of evidence in the literature.

CHAPTER 6 CONCLUSIONS & RECOMMENDATIONS

This research study investigated age as a predictor of success in the academic outcome and early professional performance of recent occupational therapy graduates. The analysis of age and academic performance at university showed that having a previous degree, not the student's age on entry to occupational therapy education predicted a higher degree classification in occupational therapy. This finding was supported by the research evidence presented in the literature review which pointed to previous academic ability as a strong predictor of academic achievement in health-care education (Green & Waterfield, 1997; Johnes, 1992; Montague & Odds, 1990).

The second part of the study investigated the impact of age on the early professional performance of recent occupational therapy graduates using a competency measure embedded in a questionnaire. The hypotheses that age is a value-added factor in the early professional performance of new graduates in practice was partially upheld in the graduate self-ratings, when mature graduates consistently rated themselves as having higher levels of competence than younger graduates. The transition into practice was seen as a stressful time for all new graduates. The narrative comments provided by graduates and the literature relating to student perceptions on entering practice point to a universal feeling of threshold anxiety and a sense of reality-shock for new graduates (Atkinson & Steward, 1997; Leonard & Carr, 1998; Parker, 1991; Tryssenaar & Perkins, 2001). The mature students in this study particularly valued their previous life and work experience which may explain the higher ratings of competence expressed by these older students.

The issue of academic ability arose again when employers rated the performance of new graduates in practice where the data showed that higher ratings of competence were associated with higher levels of academic achievement at university. No statistical age differences were observed when employers rated the competency levels of mature and younger graduates but reassuringly employers rated all graduates as competent to practice. This finding refutes the strong argument for graduate only entry to occupational therapy education currently being implemented in the US and Canada (Allen et al., 2001; CAOT, 2002). The rationale behind these strategic initiatives in North America is argued from the standpoint that master's level graduates will be more

equipped to work autonomously and have more effective decision-making skills and evidence-based practice skills than bachelor's level graduates. Although there is some evidence in the literature to support these assertions, the overall results of this study and those of Barnitt and Salmond (2000) indicate that graduates in the UK are able to make effective clinical decisions and work autonomously albeit experiencing stress initially (Hayes-Fleming & Piedmont, 1989; Rogers et al., 1988). This evidence emphasises the point made by Waters (2000) that a master's degree in North America differs substantially from a master's degree in the UK and caution should be observed before blindly following our North American colleagues. Although this study has shown that there is little evidence to support a move towards graduate level entry, it has highlighted the superior academic performance of previous degree holder in occupational therapy education. This points to a possible recruitment drive to attract more graduates to the profession and the possible development of more accelerated routes to qualification to fill the national shortage of occupational therapists (COT, 2001b)

The key finding of this research study is the fact that age alone is not a predictor of higher levels of competency on graduation, and that academic ability is an important consideration in the levels of competence demonstrated by new graduates in practice. The paucity of literature related to age and its effect on academic performance and early professional competence in health-care means that this study stands in isolation to defend its findings. This has implications for the debates arising from this study as recent government initiatives to lift barriers, widen participation and encourage lifelong learning may result in an increasing number of mature applicants to occupational therapy, some of whom may not have the required academic entry qualifications (COT, 2002; Secretary of State for Education and Employment, 1998; NCIHE, 1997; Department of Health, 2000). This study has found that age with its associated life and work experiences are not in themselves strong predictors of academic or clinical success. The findings of the study point to the academic performance of the graduate as having an influence on subsequent levels of clinical performance thus emphasising the importance of maintaining minimum academic entry requirements for mature students entering occupational therapy education.

Another important outcome of this study was the discrepancy in expectations of threshold competence observed between the employers and the graduates. This highlights the need for further investigations into the threshold skills required for fitness

to practice as an occupational therapist. This research study predated the publication of the NCIHE that recommended the development of subject benchmarking statements as the nationally agreed threshold standards for graduate competencies across the UK (NCIHE, 1997). For the profession of occupational therapy these threshold standards now describe the expectations of competence on entering practice immediately after qualification but the issue of how these standards would be measured in practice was not part of the committee's work. Further research is needed to develop a robust measure of competence using these subject-benchmarking statements. The findings of this study would suggest that the expectations of graduates and employers relative to each statement should also be explored within the context of current occupational therapy practice in the field.

To conclude, this research study has shown that age alone is not a strong predictor of success in the academic outcome and early professional performance of recent occupational therapy graduates in the UK. The academic success of previous degree holders in occupational therapy education and the subsequent statistical relationship between higher levels of academic performance at university and higher levels of competence after graduation serves to position this study within the ongoing debate over minimum academic entry requirements for entry to occupational therapy.

***SUMMARY OF RECOMMENDATIONS FOR FUTURE POLICY
DEVELOPMENTS IN OCCUPATIONAL THERAPY EDUCATION ARISING OUT
OF THIS STUDY***

The findings of this study highlight the importance of baseline academic abilities, as expressed by minimum entry requirements, when considering applications for occupational therapy degree programmes. A national recruitment drive to attract graduates to train as occupational therapists and the development of more accelerated programmes would give due recognition to the superior academic ability of previous degree holders on entry to occupational therapy education.

The study highlights the need for urgent field testing of the QAA subject-benchmarking statements in occupational therapy practice settings in order to assess the content validity of these statements. Once validated in practice, the QAA subject-benchmarking

statements could be used to develop a valid and reliable measurement tool for the assessment of professional competence of practising occupational therapists. This could be used by occupational therapy managers to benchmark the ongoing competence of their staff or assess the ability of those returning to the workforce after a period of absence. It could also be used to assess the competence of non-EC resident therapists seeking state registration in the UK.

The discrepancy of expectation of new graduates' abilities needs further professional debate. The dissemination of the findings of this study may serve to open this dialogue in the published literature and inspire new graduates to share their perspectives on the lived experience of being newly qualified and working in today's health and social care arena.

This original piece of research has answered the age-related research questions of the study but, in doing so, has now given rise to new questions about the performance of newly qualified occupational therapists in practice. Further research needs to investigate the lived experience of British graduates using longitudinal and phenomenological approaches to data collection.

The link between academic performance and performance in the clinical workplace also needs further exploration to tease out the specific elements of superior academic performance that translate into effective and highly competent practice. The new knowledge generated from this research study and the outcomes of the future research identified above will help build a clearer picture of the factors that influence and enhance the professional competence of newly qualified occupational therapists in practice.

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APPENDICES

APPENDIX 1 QUESTIONNAIRE AND LETTERS TO OCCUPATIONAL THERAPY SCHOOLS

5th March , 2000

Dear [Name of occupational therapy course director]

I am a Senior Lecturer in Occupational Therapy in the School of Health Care at Oxford Brookes University. As a part of my Doctoral degree in Education I am carrying out a research study titled:

An investigation into age as a predictor of success in the academic outcome and early professional performance of recent occupational therapy graduates in England and Wales.

The study has been approved by the Applied Qualitative Research Ethics Committee in Oxford – April 7th 2000. Ref. Number A00.015.

This first part of this study will collect cohort data from occupational therapy undergraduate programmes across England and Wales to determine if there is a relationship between age at entry and the final academic average / degree classification of recent graduates. Schools in Scotland and Northern Ireland have been excluded from the study, as their undergraduate programmes are four years in length. Each participating school is being requested to provide anonymous data on the graduating class of 1999. For each unnamed graduate; the age at entry, entry qualifications and subsequent academic average leading to degree classification is required. See attached questionnaire for further detail.

All the data collected will be stored and handled in a confidential manner. As the data required by the questionnaire is anonymous there is no means by which I, the researcher can identify any students through reading and analysing the data.

A parallel study is being carried with employers of recent graduates and graduates themselves. This part of the study looks at the early professional performance of graduates in practice.

This research is funded in part by the Farrer-Brown Professional Development Fund from the College of Occupational Therapists.

I hope that you consent to contribute to this study by compiling the data required by the enclosed questionnaire. Please return the data to me in the stamped addressed envelope or send as an attached file to <mmschanahan@brookes.ac.uk> by April 30th 2000. A reminder letter will be sent to all occupational therapy courses in the sample two weeks before the end of April. Please do not hesitate to contact me on 01865-485522 if you have any queries about this study.

Yours sincerely,

Margaret Shanahan
Senior Lecturer Occupational Therapy

Questionnaire to Occupational Therapy Undergraduate Programmes

This questionnaire asks you to provide anonymous and confidential information on the occupational therapy students who graduated from your programme in the year 1999.

Please complete the general questions about your undergraduate programme in Section 1 of the questionnaire.

The data required in Section 2 can be provided on the attached questionnaire or provided in any other manner that is convenient to you; such as an Excel or Word file. The data you provide on the graduates should be anonymous, indicating only the age at entry, entry qualifications and subsequent academic average leading to degree classification of each graduating student in the year 1999. Summer and autumn graduates are acceptable for the purposes of this study.

1. Please indicate then name of the award provided to graduates of your undergraduate programme in occupational therapy

2. Please indicate with a tick in the appropriate box if the fieldwork component of your programme is included in the final academic average/degree classification of graduates

YES NO

3. If you answered yes to the above question, please indicate what proportion fieldwork contributes to that final academic average

Percentage contribution of fieldwork

Please list the level required for entry to your programme for the year 1996

A levels-

Others –

Access course

BTec

GNVQ

HND

Id. Number of graduate	Age at entry	Name of entry qualifications	Final academic average	Degree class	Additional comments if required
<i>Sample</i> Id No. 1	19	A Levels	56%	2.2	Retake- entered in 1995
1.					
2.					
3.					
4.					
5.					
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7.					
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9.					
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43.					
44.					
45.					

Id. Number of graduate	Age at entry	Name of entry qualifications	Final academic average	Degree class	Additional comments if required
46.					
47.					
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87.					
88.					

Thank you, please return your completed questionnaire in the enclosed envelope.

21/06/2000

Dear [named Head of School]

Approximate two months ago I wrote to you requesting anonymous information about the 1999 graduates from your occupational therapy training establishment. My initial request came just before Easter and a number of schools wrote back to say that they were busy with end of term activities etc but would send the data at a later date. I extended the deadline to May 31st but was very disappointed to only hear back from 4 universities.

I am writing again and enclosing a further questionnaire in the hope that you may now be in the position to compile the necessary data for this study of new graduates. As I outlined in my original letter I am a Senior Lecturer and Admissions Tutor for Occupational Therapy in the School of Health Care at Oxford Brookes University. As a part of my Doctoral degree in Education I am carrying out a study titled;

An investigation into age as a predictor of success in the academic outcome and early professional performance of recent occupational therapy graduates in England and Wales.

The study has been approved by the Applied Qualitative Research Ethics Committee in Oxford -Friday, 07 April 2000. Ref. Number A00.015.

This first part of this study will collect cohort data from occupational therapy undergraduate programmes across England and Wales to determine if there is a relationship between age at entry and the final academic average / degree classification of recent graduates. Schools in Scotland and Northern Ireland have been excluded from the study, as their undergraduate programmes are four years in length. Each participating school is being requested to provide anonymous data on the graduating class of 1999. For each unnamed graduate; the age at entry, entry qualifications and subsequent academic average leading to degree classification is required. See attached questionnaire for further detail.

All the data collected will be stored and handled in a confidential manner. As the data required by the questionnaire is anonymous there is no means by which I, the researcher can identify named persons through reading and analysing the data.

A parallel study is being carried with employers of recent graduates and graduates themselves. This part of the study looks at the early professional performance of graduates in practice.

This research is funded in part by the Farrer-Brown Professional Development Fund from the College of Occupational Therapists.

I hope that you consent to contribute to this study by compiling the data required by the enclosed questionnaire. Please return the data to me in the stamped addressed envelope or send as an attached file to <mmshanahan@brookes.ac.uk> by July 17th 2000. Please do not hesitate to contact me on 01865-485522 if you have any queries about this study.

Yours sincerely,

Margaret Shanahan
Senior Lecturer, Occupational Therapy

APPENDIX 2 QUESTIONNAIRE AND LETTER TO EMPLOYERS

June 6th, 2000

Dear Head Occupational Therapist,

I am a Senior Lecturer in Occupational Therapy in the School of Health Care at Oxford Brookes University. As a part of my Doctoral degree in Education I am carrying out a research study titled;

An investigation into age as a predictor of success in the academic outcome and early professional performance of recent occupational therapy graduates in England and Wales.

The study has been approved by the Applied Qualitative Research Ethics Committee in Oxford - April 7th 2000. Ref. Number A00.015.

You are invited to participate in a research study by completing the enclosed questionnaire and distributing the envelopes marked 'graduate questionnaire' to any recent occupational therapy graduates in your department. The parallel study being carried with graduates asks them to also rate their perceived performance in practice. However your enclosed research questionnaire should be considered in isolation from your employee(s) and not be used as part of the appraisal / supervision process.

If you have employed a recent graduate, now is a good time to ask you or a supervising therapist to provide valuable feedback on your perception of how occupational therapy training has prepared them for the realities of practice. The questionnaire asks you to judge their level of ability relative to the expectations of newly qualified occupational therapists as published by the College of Occupational Therapists in 1999. The questionnaire also asks you to provide some anonymous background information on the employee that will be used to compare different age groups of recent graduates and different modes of occupational therapy training and their academic awards. If you have not employed any recent graduates then please return to the questionnaires to me in the stamped addressed envelopes.

All the data collected by the questionnaire will be stored and handled in a confidential manner. As the questionnaire is un-coded and anonymous there is no means by which I, the researcher can identify named persons, occupational therapy departments or training establishments through reading and analysing the data. Thus all responses to the questions and additional comments will be used only to provide an overall picture of recent graduates in practice. The research is funded in part by the Farrer-Brown Professional Development Fund from the College of Occupational Therapists. I hope that you consent to contribute to this study by completing the enclosed questionnaire. After you have completed the questionnaire(s) - which should take approximately 15 minutes each - return them to me in by July 31st 2000. Please do not hesitate to contact me on 01865-485522 if you have any queries about this study.

Yours sincerely,

Margaret Shanahan,
Senior Lecturer - Occupational Therapy

QUESTIONNAIRE TO EMPLOYERS

Thank you for starting to complete this questionnaire. The first question asks you to provide some anonymous and confidential information concerning the recent occupational therapy graduate you have employed. The following question asks you to rate their performance on a four point scale in relation to a list of skills, behaviours and abilities required of graduating occupational therapy students to be eligible for state registration as an occupational therapist.

QUESTION 1

- a Please indicate the age of your employee when they **STARTED** their occupational therapy training.

Under 21 years of age	
Over 21 years of age	

- b (i) Please indicate the type of occupational therapy training programme undertaken by the employee by ticking the appropriate training programme.

- (ii) Please insert the year of qualification and the level of academic award, for example; 1998, 2.2 degree

Training programme	<i>Please tick</i>		<i>Insert year of qualification</i>	<i>Insert level of academic award</i>
3 year BSc/ BA (Hons) degree -full time	<input type="checkbox"/>	→		
4 year BSc/ BA (Hons) degree -full time	<input type="checkbox"/>	→		
BSc/ BA (Hons) degree - IN-SERVICE	<input type="checkbox"/>	→		
2 year Post Graduate Diploma	<input type="checkbox"/>	→		
Other – please indicate	<input type="checkbox"/>			

This next section of the questionnaire asks you to consider how your employee's occupational therapy training and initial experience has enabled them to practice effectively as a state registered occupational therapist.

Please tick the box that best represents your level of agreement with the following statements related to the professional competence of your employee.	Strongly agree	Agree	Disagree	Strongly disagree	Not applicable
They can describe the unique perspective from which occupational therapists approach their work					
They can reason effectively, make judgements & take decisions to a level of competence commensurate with a qualifying practitioner					
They can justify decisions and interventions from a theoretical base					
They can justify decisions and interventions on the basis of service user need and available resources					
They can integrate knowledge and professional skills and so work with people with multiple and complex needs,					
They can participate in groups, facilitate group work, understand group dynamics and understand roles within, and influences on groups and teams					
They can reflect on his/her professional practice and service provided to users					
They can work both as an independent practitioner and collaboratively as a member of a team to effect service delivery					
They can work to, and articulate the limits of his/her own competence and seek help and guidance accordingly					
They can share acquired knowledge and skills with others using various teaching and presentation skills and methods					
They can contribute to the work of the organisation in which employed as an occupational therapist					
They can demonstrate self management skills and independence in thought and action					
They can draw on the principle of supervision in relation to self and others					
They can use supervision and/or consultation to promote personal effectiveness and competence					
They can reflect on, and critique their own performance and the performance of others					
They can give, receive and respond to constructive feedback on their performance					
They can work with change					
They can articulate and work to the value base and principles which underpin occupational therapy practice					
They can draw on ethical principles in the process of reasoning					
They can demonstrate attitudes which ensure that service users' and carers' expressed needs and choices, become the focus of the care management process					
They have a sound theoretical basis to underpin occupational therapy practice when working with people of all ages and people who have physical dysfunction social dysfunction, mental health problems or learning disabilities					

Please tick the box that best represents your level of agreement with the following statements related to the professional competence of your employee.	Strongly agree	Agree	Disagree	Strongly disagree	Not applicable
They can prioritise referrals based on information and organisational policy					
They can assess and manage the care of people with occupational performance deficits in self-care productivity or leisure; enable them to achieve functional performance in their chosen environment as independently as they would wish and as their circumstances allow					
They can select and apply theoretical frameworks pertinent to occupational therapy and use them selectively to guide intervention					
They can select and use standardised and non-standardised assessments and identify service users' functional capacity, occupational performance strengths and deficits					
They can undertake role, functional, task and activity analysis					
They share information to empower the service user					
They can assess risk and take decisions related to the ability of the service user to function in his/her community environment					
They can select, adapt and use therapeutic media, techniques and activity (to assist the service user) to maintain, enhance, or come to terms with changes in occupational performance					
They can actively promote and apply the principles of health promotion and education					
They can evaluate his/her own professional practice and the service provided to users					
They can work with service users from diverse cultural and ethnic groups					
They can maintain appropriate records of therapeutic activity					
They can appraise methods of service delivery					
They can demonstrate personal conduct conducive with professional status					
They can work safely as an occupational therapist					
They can work to the profession's Code of Ethics and Professional Conduct					
They can specify and work to legislation which affect service delivery and his/her own practice					
They can work with legal, ethical and professional parameters					
They can take personal responsibility for professional performance and actions					
They can recognise factors that affect the health of the practising professional and take steps to minimise risk of harm to themselves and others					

Please tick the box that best represents your level of agreement with the following statements related to the professional competence of your employee.	Strongly agree	Agree	Disagree	Strongly disagree	Not applicable
They can apply the principles of quality assurance, including methods of audit, to his/her own practice					
They can draw on research on practice and establish the evidence on which to base practice					
They take steps to develop their knowledge and expertise and engage in continuing professional development					
They use their experience, research, professional knowledge and skills to enhance their own development.					
They use their experience, research, professional knowledge and skills to enhance the development of occupational therapy in general.					

Please feel free to use the space below to provide the researcher with any additional comments relating to the level of competence of newly qualified occupational therapists.

THANK YOU FOR COMPLETING THIS QUESTIONNAIRE
PLEASE RETURN IT IN THE ENVELOPE PROVIDED BY June 30th 2000

APPENDIX 3 QUESTIONNAIRE AND LETTERS TO GRADUATES

June 6th, 2000

Dear Occupational Therapy Graduate,

I am a Senior Lecturer in Occupational Therapy in the School of Health Care at Oxford Brookes University. As a part of my Doctoral degree in Education I am carrying out a research study titled:

An investigation into age as a predictor of success in the academic outcome and early professional performance of recent occupational therapy graduates in England and Wales.

The study has been approved by the Applied Qualitative Research Ethics Committee in Oxford – April 7th 2000. Ref. Number A00.015.

You are invited to participate in this research study by completing the enclosed questionnaire. Now that you are approximately 6 months qualified it is a good time to ask you to provide valuable feedback on your perception of how your occupational therapy training prepared you for the real world of occupational therapy practice. This questionnaire asks you to consider your perceived level of ability relative to the expectations of newly qualified occupational therapists as published by the College of Occupational Therapists in 1999. The questionnaire also asks you to provide some background information that will be used to compare different age groups of recent graduates and different modes of occupational therapy training and their academic awards.

All the data collected by the questionnaire will be stored and handled in a confidential manner. As the questionnaire is un-coded and anonymous there is no means by which I, the researcher can identify named persons or training establishments through reading and analysing the data. Thus all responses to the questions and additional comments will be used only to provide an overall picture of recent graduates in practice. The research is funded in part by the Farrer-Brown Professional Development Fund from the College of Occupational Therapists. A parallel study is being carried with employers asking them to rate the performance of recent graduates in practice. However your enclosed research questionnaire should be considered in isolation from your employer and not be used as part of the appraisal / supervision process.

I hope that you consent to contribute to this study by completing the enclosed questionnaire. After you have completed the questionnaire - which should take approximately 15 minutes - return it to me in the stamped addressed envelope by July 31st 2000. Please do not hesitate to contact me on 01865-485522 if you have any queries about this study.

Yours sincerely,

Margaret Shanahan
Senior Lecturer in Occupational Therapy

GRADUATE QUESTIONNAIRE

Thank you for starting to complete this questionnaire. The first question asks you to provide some anonymous and confidential information relating to your training as an occupational therapist. Question 2 asks you to consider your ability compared to a list of competency statements related to the required skills, behaviours and abilities of graduating occupational therapy students applying for state registration as an occupational therapist (COT,1999).

QUESTION 1

- a Please indicate with a tick your age category when you **STARTED** occupational therapy training.

Under 21 years of age	
Over 21 years of age	

- b (i) Please indicate the type of occupational therapy training programme you undertook by ticking the appropriate training programme box.

(ii) Please insert your year of qualification and the level of academic award on graduation as an occupational therapist, for example; 1997, 2.2 degree.

Training programme	<i>Please tick</i>	<i>Insert year of qualification</i>	<i>Insert level of academic award</i>
3 year BSc/ BA (Hons) degree -full time			
4 year BSc/ BA (Hons) degree -full time			
BSc/ BA (Hons) degree - IN-SERVICE			
2 year Post Graduate Diploma			
Other - please indicate			

This next section of the questionnaire asks you to consider how your occupational therapy training and initial experience has enabled you to practice as a state registered occupational therapist. Please answer the following question as honestly as possible.

Please tick the box that best represents your level of agreement with the following statements.	Strongly agree	Agree	Disagree	Strongly disagree	Not Applicable
I am able to describe the unique perspective from which occupational therapists approach their work					
I can reason effectively, make judgements & take decisions to a level of competence expected of a qualifying practitioner					
I can justify decisions on the basis of service user need and available resources					
I can justify decisions and interventions from a theoretical base					
I can integrate knowledge and professional skills and so work with people with multiple and complex needs,					
I can participate in groups, facilitate group work, understand group dynamics and understand roles within, and influences on groups and teams					
I can reflect on my professional practice and service provided to users					
I can work both as an independent practitioner and collaboratively as a member of a team to effect service delivery					
I work to, and articulate the limits of my own competence and seek help and guidance accordingly					
I can share acquired knowledge and skills with others using various teaching and presentation skills and methods					
I contribute to the work of the organisation in which I am employed as an occupational therapist					
I demonstrate self management skills and independence in thought and action					
I can draw on the principle of supervision in relation to myself and others					
I use supervision and/or consultation to promote my personal effectiveness and competence					
I reflect on, and critique my own performance and the performance of others					
I can give, receive and respond to constructive feedback on my performance					
I can work with change					
I can articulate and work to the value base and principles which underpin occupational therapy practice					
I can draw on ethical principles in the process of reasoning					
I demonstrate attitudes which ensure that service users' and carers' expressed needs and choices, become the focus of the care management process					
I have a sound theoretical basis to underpin occupational therapy practice when working with people of all ages and people who have physical dysfunction, social					

Please tick the box that best represents your level of agreement with the following statements.	Strongly agree	Agree	Disagree	Strongly disagree	Not Applicable
dysfunction, mental health problems or learning disabilities					
I can prioritise referrals based on information and organisational policy					
I can assess and manage the care of people with occupational performance deficits in self-care productivity or leisure; enable them to achieve functional performance in their chosen environment as independently as they would wish and as their circumstances allow					
I can select and apply theoretical frameworks pertinent to occupational therapy and use them selectively to guide intervention					
I can select and use standardised and non-standardised assessments and identify service users' functional capacity, occupational performance strengths and deficits					
I can undertake role, functional, task and activity analysis					
I share information to empower the service user					
I can assess risk and take decisions related to the ability of the service user to function in his/her community environment					
I can select, adapt and use therapeutic media, techniques and activity (to assist the service user) to maintain, enhance, or come to terms with changes in occupational performance					
I can actively promote and apply the principles of health promotion and education					
I can evaluate my own professional practice and the service provided to users					
I can work with service users from diverse cultural and ethnic groups					
I can maintain appropriate records of therapeutic activity					
I can appraise methods of service delivery					
I demonstrate personal conduct conducive with professional status					
I can work safely as an occupational therapist					
I work to the profession's Code of Ethics and Professional Conduct					
I can specify and work to legislation which affects service delivery and my own practice					
I can work with legal, ethical and professional parameters					
I can take personal responsibility for my professional performance and actions					
I can recognise factors that affect the health of the practising professional and take steps to minimise risk of harm to myself and others					

Please tick the box that best represents your level of agreement with the following statements.	Strongly agree	Agree	Disagree	Strongly disagree	Not Applicable
I can apply the principles of quality assurance, including methods of audit, to his/her own practice					
I can draw on research and establish the evidence on which to base practice					
I can take steps to develop knowledge and expertise and engage in continuing professional development					
I can use my experience, research, my professional knowledge and skills to enhance my own development					
I can use my experience, research, my professional knowledge and skills to enhance the development of occupational therapy in general					

Please feel free to use the space below to provide the researcher with any additional comments relating to the level of competence expected of newly qualified occupational therapists.

THANK YOU FOR COMPLETING THIS QUESTIONNAIRE
PLEASE RETURN IT IN THE ENVELOPE PROVIDED BY June 30th 2000

APPENDIX 4 INTERNAL & EXTERNAL ETHICAL APPROVAL DOCUMENTS

Manor House
Headley Way, Headington
Oxford OX3 9DZ

Our Ref. LAB/A00.015

07.04.00

Miss Margaret Shanahan
School of Health Care
Dorset House
Oxford Brookes University
58 London Road
Headington
Oxford OX3 7PE

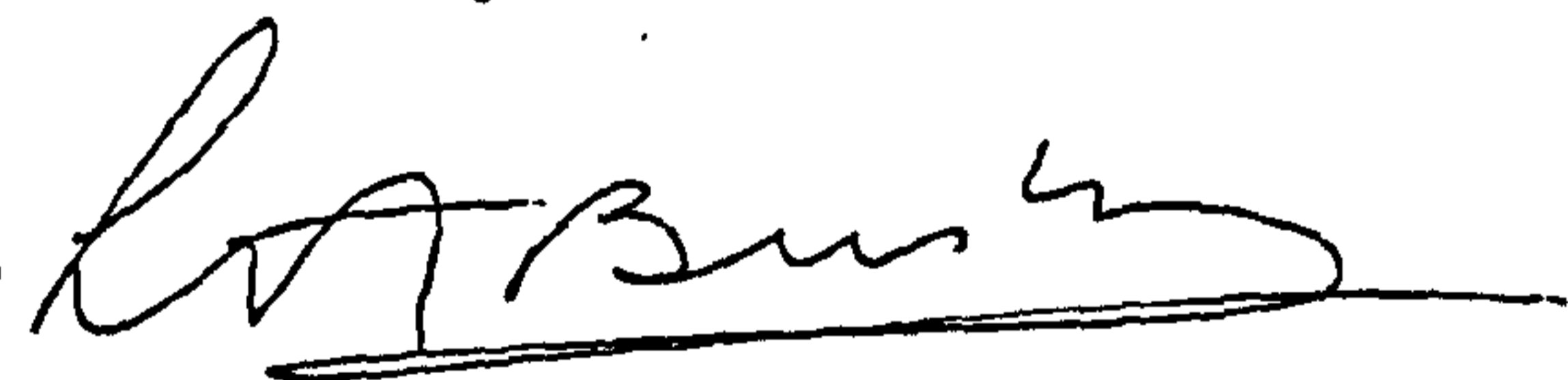
Dear Miss Shanahan

Re: A00.015 - An investigation into age as a predictor of success in the academic outcome and early professional performance of recent occupational therapy graduates

We are in receipt of a letter from Oxford Brookes University confirming that the appropriate indemnity is in place for your research project. I can now confirm final approval and wish you every success with your study.

Best wishes.

Yours sincerely



Lorraine Busby
AQREC Administrator
Applied & Qualitative Research Ethics Committee
Tel: 01865 (2)22758 Fax: 01865 (2)22699
E-mail Lorraine.Busby@orh.anglox.nhs.uk

OXFORD BROOKES UNIVERSITY
SCHOOL OF HEALTH CARE STUDIES
RESEARCH COMMITTEE

RESEARCHER: Margaret M. Shanahan

SUPERVISOR: Prof. Helen Bartlett

PROGRAMME: Doctorate in Education

TITLE OF PROJECT: An investigation into age as a predictor of success in the early professional performance & academic outcome of OT graduates.

DATE SUBMITTED: January 25th '00

REVIEWER: Julie Wintup

APPROVAL GRANTED: YES / NO

COMMENTS: • Is not applicable category useful for managers who may not know the answer?
• might be useful to make explicit that this should not be done in conjunction with Basic Grade, as some may be tempted to use in supervision context.

SIGNED:

DATE:

Julie Wintup
1/2/00

APPENDIX 5 STATISTICAL COMPUTER OUTPUT

Appendix 5

Section one

Computer statistical output for Part 1 questionnaire to occupational therapy schools

- t test between occupational therapy schools
 - t test between age groups
 - repeat t test with degree entrants removed
- One way ANOVA between groups for academic averages
- Two ANOVA- age and entry qualifications and their impact on academic averages

Univariate Analysis of Variance

Between-Subjects Factors

School	Value Label	N
1		70
2		73
6		30
8		87
12		32
14		24
16		81
18		28

Descriptive Statistics

Dependent Variable: academic average

School	Mean	Std. Deviation	N
	60.2114	4.5276	70
	61.4808	6.1991	73
	58.0927	4.5924	30
	57.4299	5.6205	87
	64.1428	5.6984	32
	62.5000	5.2170	24
	63.6828	6.6591	81
	62.4643	5.9968	28
Total	60.9458	6.1613	425

Tests of Between-Subjects Effects

Dependent Variable: academic average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	2434.728 ^a	7	347.818	10.617	.000	.151
Intercept	1239003.183	1	1239003.183	37820.961	.000	.989
SCHOOL	2434.728	7	347.818	10.617	.000	.151
Error	13660.793	417	32.760			
Total	1594710.891	425				
Corrected Total	16095.522	424				

a. R Squared = .151 (Adjusted R Squared = .137)

T-Test

Group Statistics

agegroup		N	Mean	Std. Deviation	Std. Error Mean
academic average	under 21 at entry	171	59.7951	4.8965	.3744
	over 21 -mature	254	61.7204	6.7832	.4256

Independent Samples Test

		Levene's Test for Equality of Variances	
		F	Sig.
academic average	Equal variances assumed	18.730	.000
	Equal variances not assumed		

Independent Samples Test

		t-test for Equality of Means			
		t	df	Sig. (2-tailed)	Mean Difference
academic average	Equal variances assumed	-3.193	423	.002	-1.9253
	Equal variances not assumed	-3.396	420.926	.001	-1.9253

Independent Samples Test

		t-test for Equality of Means		
		Std. Error Difference	95% Confidence Interval of the Difference	
			Lower	Upper
academic average	Equal variances assumed	.6030	-3.1105	-.7401
	Equal variances not assumed	.5669	-3.0396	-.8110

- repeat t test with degree entrants removed

T-Test

Group Statistics

agegroup		N	Mean	Std. Deviation	Std. Error Mean
academic average	under 21 at entry	171	59.7951	4.8965	.3744
	over 21 -mature	184	60.7021	6.9452	.5120

Independent Samples Test

		Levene's Test for Equality of Variances	
		F	Sig.
academic average	Equal variances assumed	16.452	.000
	Equal variances not assumed		

Independent Samples Test

		t-test for Equality of Means			
		t	df	Sig. (2-tailed)	Mean Difference
academic average	Equal variances assumed	-1.412	353	.159	-.9070
	Equal variances not assumed	-1.430	329.605	.154	-.9070

Independent Samples Test

		t-test for Equality of Means		
		Std. Error Difference	95% Confidence Interval of the Difference	
			Lower	Upper
academic average	Equal variances assumed	.6422	-2.1700	.3560
	Equal variances not assumed	.6343	-2.1548	.3408

- One way ANOVA between groups for academic averages

Univariate Analysis of Variance

Between-Subjects Factors

	Value Label	N
agegroup 1	under 21 at entry	171
2	over 21 -mature	254

Tests of Between-Subjects Effects

Dependent Variable: academic average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	378.819 ^a	1	378.819	10.196	.002	.024
Intercept	1509054.136	1	1509054.136	40614.747	.000	.990
AGEGROUP	378.819	1	378.819	10.196	.002	.024
Error	15716.703	423	37.155			
Total	1594710.891	425				
Corrected Total	16095.522	424				

a. R Squared = .024 (Adjusted R Squared = .021)

Univariate Analysis of Variance

Between-Subjects Factors

	Value Label	N
qualifactions on entry 1	Access course	72
2	BTec	27
3	HND	6
4	GNVQ	16
5	Other	46
6	A levels	188
7	degree	70

Tests of Between-Subjects Effects

Dependent Variable: academic average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	1242.411 ^a	6	207.069	5.827	.000	.077
Intercept	562662.916	1	562662.916	15834.602	.000	.974
ENTRY	1242.411	6	207.069	5.827	.000	.077
Error	14853.111	418	35.534			
Total	1594710.891	425				
Corrected Total	16095.522	424				

a. R Squared = .077 (Adjusted R Squared = .064)

Between-Subjects Factors

		Value Label	N
agegroup	1	under 21 at entry	171
	2	over 21 -mature	254
qualifactions on entry	1	Access course	72
	2	BTec	27
	3	HND	6
	4	GNVQ	16
	5	Other	46
	6	A levels	188
	7	degree	70

Tests of Between-Subjects Effects

Dependent Variable: academic average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Model	1580170.806 ^a	12	131680.901	3740.295	.000	.991
AGEGROUP	23.581	1	23.581	.670	.414	.002
ENTRY	997.965	6	166.328	4.724	.000	.064
AGEGROUP * ENTRY	36.750	4	9.188	.261	.903	.003
Error	14540.085	413	35.206			
Total	1594710.891	425				

a. R Squared = .991 (Adjusted R Squared = .991)

Univariate Analysis of Variance

Between-Subjects Factors

	Value Label	N
agegroup	1 under 21 at entry	171
	2 over 21 -mature	254
qualifications on entry	1 Access course	72
	2 BTec	27
	3 HND	6
	4 GNVQ	16
	5 Other	46
	6 A levels	188
	7 degree	70

- Two ANOVA- age and entry qualifications and their impact on academic averages

Descriptive Statistics

Dependent Variable: academic average

agegroup	qualifications on entry	Mean	Std. Deviation	N
under 21 at entry	BTec	59.0867	6.2902	9
	HND	63.8500	1.0607	2
	GNVQ	58.5933	4.3739	15
	Other	56.0929	2.7908	7
	A levels	60.1010	4.8898	138
	Total	59.7951	4.8965	171
over 21 -mature	BTec	61.5378	5.5877	18
	HND	61.0800	7.7338	4
	GNVQ	60.8000	.	1
	Other	58.9626	6.8082	39
	A levels	62.5118	7.8173	50
	Access course	60.1564	6.5486	72
	degree	64.3971	5.5449	70
	Total	61.7204	6.7832	254
Total	BTec	60.7207	5.8288	27
	HND	62.0033	6.1773	6
	GNVQ	58.7313	4.2614	16
	Other	58.5259	6.4238	46
	A levels	60.7422	5.8882	188
	Access course	60.1564	6.5486	72
	degree	64.3971	5.5449	70
	Total	60.9458	6.1613	425

Levene's Test of Equality of Error Variances^a

Dependent Variable: academic average

F	df1	df2	Sig.
2.614	11	413	.003

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept+AGEGROUP+ENTRY+AGEGROUP * ENTRY

Tests of Between-Subjects Effects

Dependent Variable: academic average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	1555.437 ^a	11	141.403	4.016	.000	.097
Intercept	283818.989	1	283818.989	8061.662	.000	.951
AGEGROUP	23.581	1	23.581	.670	.414	.002
ENTRY	997.965	6	166.328	4.724	.000	.064
AGEGROUP * ENTRY	36.750	4	9.188	.261	.903	.003
Error	14540.085	413	35.206			
Total	1594710.89	425				
Corrected Total	16095.522	424				

a. R Squared = .097 (Adjusted R Squared = .073)

Estimated Marginal Means

1. agegroup

Dependent Variable: academic average

	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
agegroup under 21 at entry	59.545 ^a	1.080	57.422	61.667
agegroup over 21 -mature	61.349 ^a	.996	59.392	63.306

a. Based on modified population marginal mean.

2. qualifications on entry

Dependent Variable: academic average

qualifications on entry	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Access course	60.156 ^a	.699	58.782	61.531
BTec	60.312 ^a	1.211	57.931	62.693
HND	62.465 ^a	2.569	57.415	67.515
GNVQ	59.697 ^a	3.064	53.674	65.720
Other	57.528 ^a	1.218	55.134	59.922
A levels	61.306 ^a	.490	60.344	62.269
degree	64.397 ^a	.709	63.003	65.791

a. Based on modified population marginal mean.

3. agegroup * qualifications on entry

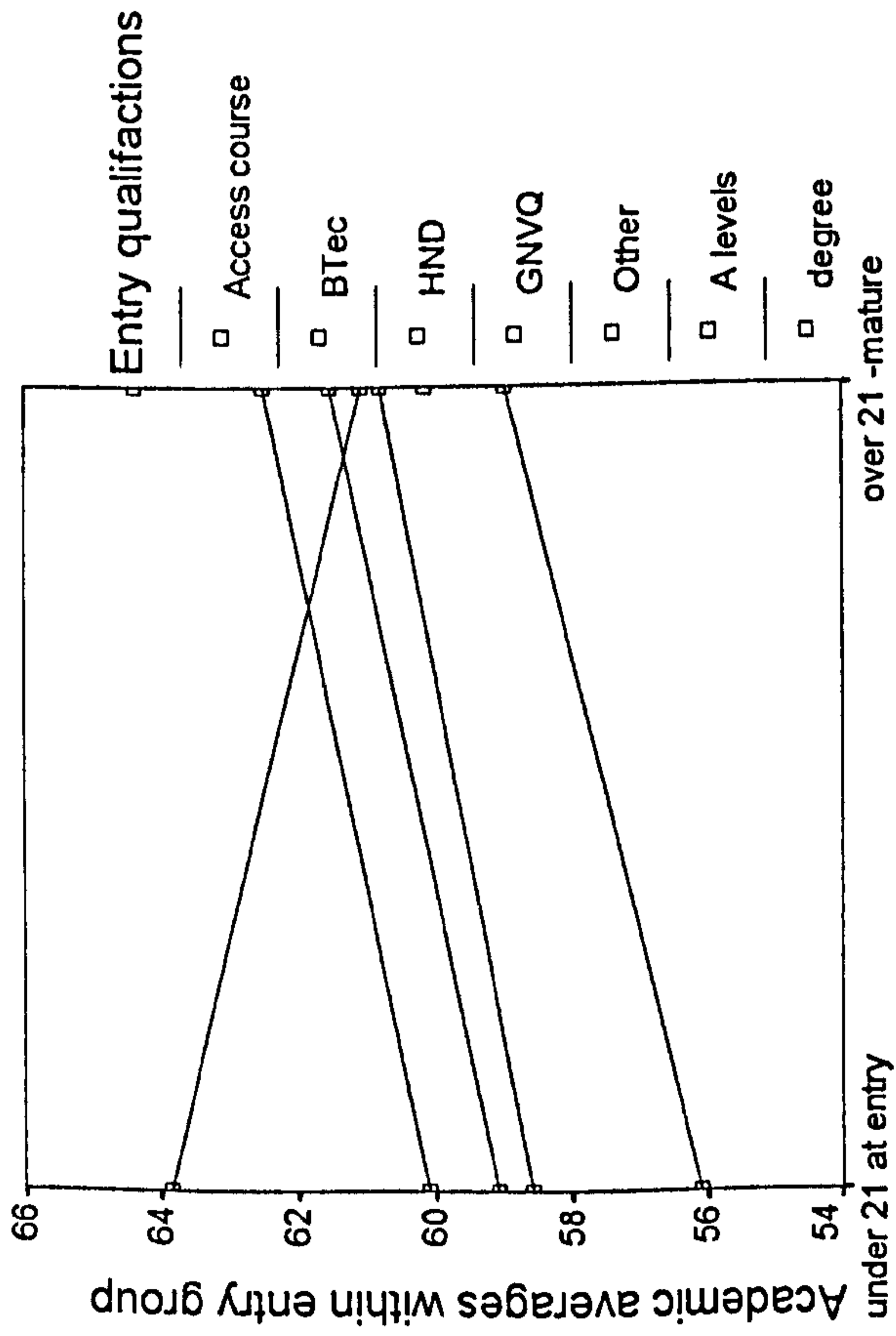
Dependent Variable: academic average

agegroup	qualifications on entry	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
under 21 at entry	Access course	^a			
	BTec	59.087 ^b	1.978	55.199	62.975
	HND	63.850 ^b	4.196	55.603	72.097
	GNVQ	58.593 ^b	1.532	55.582	61.605
	Other	56.093 ^b	2.243	51.684	60.501
	A levels degree	60.101 ^b	.505	59.108	61.094
over 21 -mature	Access course	^a			
	BTec	60.156 ^b	.699	58.782	61.531
	HND	61.538 ^b	1.399	58.789	64.287
	GNVQ	61.080 ^b	2.967	55.248	66.912
	Other	60.800 ^b	5.933	49.136	72.464
	A levels degree	58.963 ^b	.950	57.095	60.830
		62.512 ^b	.839	60.862	64.161
		64.397 ^b	.709	63.003	65.791

a. This level combination of factors is not observed, thus the corresponding population marginal mean is not estimable.

b. Based on modified population marginal mean.

Profile Plots



agegroup

means for access and degree are not plotted

- **Appendix 5**

Section two

Computer statistical output for Part 2

competency questionnaire to employers and graduates

- **Factor analysis**
 - **Reliability of factor sub-scales**
 - **Mann Whitney U test of age and un-weighted sub-scale scores**
 - **Repeat test : t test of age and weighted Bartlett factor sub-scale scores**
 - **Kruskal- Wallis ANOVA on type of education and un-weighted sub-scale scores**
 - **Kruskal- Wallis ANOVA on level of award and un-weighted sub-scale scores**
 - **Kruskal- Wallis ANOVA on year of qualification and un-weighted sub-scale scores**
 - **MANOVA on Age, level of award and weighted Bartlett factor sub-scale scores**

Rotated Component Matrix

	Component									
	1	2	3	4	5	6	7	8	9	10
use supervision to promote competence	.771	.127	8.134E-02	.225	.161	.140	7.465E-02	-4.693E-02	.168	8.186E-03
understand principles of supervision	.723	9.906E-02	7.120E-02	.231	.159	.219	.117	7.432E-02	.132	4.661E-02
give, receive, respond to feedback	.672	.334	.293	1.086E-02	3.684E-02	.187	4.191E-02	6.499E-02	-2.646E-02	2.432E-03
critique own and others performance	.597	.118	.164	-6.069E-02	.255	9.552E-02	.346	.230	-6.022E-02	.198
know personal limits	.557	.457	.215	.155	5.960E-02	3.119E-02	.118	.144	4.563E-02	1.045E-02
evaluate own practice	.380	.141	.231	.290	.176	.139	.342	.377	-2.681E-03	8.370E-02
work with change	.186	.634	.192	.115	2.042E-02	.235	.244	.107	2.557E-02	2.793E-02
prioritise referrals	.175	.611	.230	.142	.162	1.266E-02	-4.018E-02	.341	.233	2.976E-02
work alone and in team to effect service delivery	.321	.559	.283	.180	.149	7.500E-02	.148	-1.539E-02	-1.943E-03	.241
reason effectively	9.986E-02	.521	.169	.144	.515	2.849E-02	-3.289E-02	8.639E-02	.372	.130
self-management	.318	.497	.225	.199	.313	.124	3.913E-02	3.504E-02	2.802E-02	9.380E-02
maintain records	1.301E-02	.480	.187	.151	-5.481E-02	.114	.367	.182	.410	7.163E-03
Share knowledge	.297	.392	-7.971E-02	.349	.154	.381	.357	-4.650E-02	9.696E-02	2.063E-03
work to code of ethics	.161	.426	.670	1.133E-02	3.869E-02	.168	.235	-2.941E-02	9.698E-02	-3.205E-02
take responsibility for actions	.297	.162	.659	8.513E-02	.222	.233	8.080E-02	.217	2.065E-02	3.817E-03
work within legal, ethical and professional parameters	9.666E-02	.229	.657	.189	.190	5.011E-02	.277	.208	-5.428E-02	-1.588E-02
work safely as an OT	.226	.434	.652	.157	8.280E-02	5.744E-02	.106	4.375E-02	.160	8.856E-02
work to a specify relevant legislation	5.317E-03	.107	.621	.195	.159	.230	.176	.275	3.286E-02	-.111
professional conduct	.187	-3.830E-02	.550	3.191E-02	-6.280E-02	.185	-2.687E-03	-.301	.476	.199
use select and use assessment tools	5.812E-02	.139	.112	.710	.141	-6.967E-03	.143	.244	.211	-1.220E-02
select adapt and use therapeutic media	.124	.440	-2.088E-02	.602	.170	.178	.127	.114	1.113E-02	3.934E-02
activity analysis	.307	.151	.247	.526	.114	-3.030E-02	.177	.122	.266	7.719E-02
client centered attitudes	.298	2.485E-02	.293	.496	.158	-5.533E-02	.280	3.612E-02	-.113	8.560E-02
assessment and treat clients	5.269E-02	.377	.376	.466	.197	.154	.165	-3.865E-02	-8.876E-02	.186

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

1

2

3

4

	Component									
	1	2	3	4	5	6	7	8	9	10
integrate knowledge and skills	.231	.376	.193	.394	.262	.164	-1.270E-02	8.980E-02	.300	-3.867E-02
justify OT to service needs and resources	.124	.199	.129	-3.995E-03	.720	.109	.213	.160	.190	1.115E-02
theory to underpin OT	.137	.155	.155	.321	.656	.212	2.744E-02	8.171E-03	2.579E-02	2.936E-02
select theoretical frameworks	.259	-.131	7.670E-03	.430	.596	.368	3.318E-02	1.954E-02	-3.516E-02	4.883E-02
develop others and the service	.214	3.621E-02	.251	1.188E-02	.147	.718	8.645E-02	1.545E-02	.145	8.213E-02
apply audit	2.002E-02	.130	.150	.428	6.724E-02	.611	5.532E-02	.385	1.464E-02	.165
self development of graduates	.345	.241	.256	-9.291E-02	.186	.557	.222	.132	3.017E-02	-1.287E-02
draw on research and evidence	.105	.299	.156	3.261E-02	.316	.457	.119	7.316E-02	4.243E-02	.279
work with cultural groups	7.282E-02	6.996E-02	.255	.205	5.590E-02	.161	.578	8.516E-02	-2.041E-02	.133
describe unique perspective of OT	.158	2.408E-02	.119	.256	.503	-6.609E-02	.512	7.408E-02	5.390E-02	.104
develop and engage in CPD	.295	.265	.225	9.091E-03	3.192E-02	.370	.481	7.356E-02	.189	4.923E-02
ethical reasoning	.199	.219	.130	.199	.358	5.146E-02	.436	.341	.158	-3.004E-02
work to value base of OT	.169	.126	.121	.304	.287	.350	.418	-6.595E-02	.271	5.209E-02
reflect on ot	.362	.151	4.790E-02	5.589E-02	.377	.262	.392	.233	.127	5.043E-02
empower service users	.319	.262	.310	.288	3.665E-02	2.480E-02	.380	.188	.153	.177
appraise methods of service delivery	4.054E-02	.169	.129	.180	.145	.163	.221	.688	5.144E-02	.216
recognise ill health in the work place in self and others	.280	7.280E-03	.498	.118	-1.894E-02	.153	-5.815E-02	.524	.187	.104
assess risk	.366	.387	.203	.209	.106	-8.423E-02	.136	.424	.126	9.743E-02
justify theoretical base	.109	.177	2.730E-02	.135	.269	.122	.117	.169	.728	3.840E-02
health promotion and education	1.609E-02	3.904E-02	-6.621E-02	6.967E-02	-2.546E-03	7.448E-02	.106	.172	6.063E-02	.860
contribute to OT organisation	.256	.397	.186	5.761E-02	.282	.279	.102	2.150E-02	3.766E-02	.561

5

6

7

8

to No 5

to No 2

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 21 iterations.

	describe unique perspective of OT	reason effectively	justify theoretical base	justify OT to service needs and resourcess	integrate knowledge and skills	reflect on ot	work alone and in team to effect service delivery
Correlation	1.000	.395	.279	.459	.364	.421	.352
describe unique perspective of OT	.395	1.000	.551	.505	.539	.413	.484
reason effectively	.279	.551	1.000	.395	.469	.308	.243
justify OT to service needs and resourcess	.459	.505	.395	1.000	.386	.482	.334
integrate knowledge and skills	.364	.539	.469	.386	1.000	.346	.447
reflect on ot	.421	.413	.308	.482	.346	1.000	.417
work alone and in team to effect service delivery	.352	.484	.243	.334	.447	.417	1.000
know personal limits	.218	.400	.260	.307	.408	.418	.568
Share knowledge	.375	.314	.355	.377	.455	.438	.483
contribute to OTorganisation	.335	.486	.293	.403	.355	.381	.570
self-management	.317	.537	.255	.407	.468	.445	.518
understand principles of supervision	.320	.347	.303	.325	.429	.488	.396
use supervision to promote competence	.306	.322	.312	.309	.441	.393	.388
critique own and others performance	.435	.294	.223	.355	.307	.498	.399
give, recieve, respond to feedback	.201	.293	.210	.290	.394	.375	.479
work with change	.275	.433	.298	.325	.421	.308	.455
work to value base of OT	.417	.354	.410	.422	.394	.463	.357
ethical reasoning	.449	.440	.336	.491	.376	.513	.395
client centered attitudes	.372	.245	.209	.276	.323	.264	.377
theory to underpin OT	.401	.456	.319	.505	.386	.395	.312
prioritise referrals	.242	.519	.340	.403	.474	.320	.505
asesment and treat clients	.341	.434	.224	.317	.420	.311	.487
select theoretical frameworks	.385	.300	.271	.460	.342	.429	.208

	describe unique perspective of OT	reason effectively	justify theoretical base	justify OT to service needs and resources	integrate knowledge and skills	reflect on ot	work alone and in team to effect service delivery
Correlation	.371	.371	.356	.252	.457	.302	.308
useselect and use assessment tools	.417	.413	.296	.329	.407	.405	.378
activity analysis	.401	.370	.305	.319	.351	.440	.483
empower service users	.285	.421	.370	.310	.407	.423	.463
assess risk	.356	.476	.283	.288	.488	.358	.448
select adapt and use therapeutic media	.131	.148	.146	.095	.130	.143	.147
health promotion and education	.468	.336	.354	.379	.465	.472	.365
evaluate own practice	.393	.203	.175	.259	.233	.359	.335
work with cultural groups	.247	.394	.404	.284	.382	.297	.359
maintain records	.325	.282	.295	.370	.314	.402	.347
appraise methods of service delivery	.085	.184	.253	.153	.258	.165	.300
professional conduct	.281	.506	.302	.308	.459	.341	.561
work safely as an OT	.229	.414	.264	.287	.387	.352	.454
work to code of ethics	.256	.282	.234	.322	.396	.303	.303
work to a specify relevant legislation	.350	.326	.224	.329	.420	.328	.415
work within legal,ethical and professional parameters	.327	.358	.261	.384	.433	.348	.433
take responsibility for actions	.193	.301	.280	.211	.245	.306	.336
recognise ill health in the work place in self and others	.263	.270	.255	.272	.392	.386	.303
apply audit	.206	.421	.307	.370	.302	.440	.397
draw on research and evidence	.292	.311	.380	.328	.337	.513	.401
develop and engage in CPD							
Correlation	.324	.370	.284	.363	.378	.426	.401
self development of graduates	.231	.308	.229	.301	.296	.394	.330
develop others and the service							

Correlation	know personal limits	Share knowledge	contribute to OT organization	self-management	understand principles of supervision	use supervision to promote competence	critique own and others performance
describe unique perspective of OT	.218	.375	.335	.317	.320	.306	.435
reason effectively	.400	.314	.486	.537	.347	.322	.294
justify theoretical base	.260	.355	.293	.255	.303	.312	.223
justify OT to service needs and resources	.307	.377	.403	.407	.325	.309	.355
integrate knowledge and skills	.408	.455	.355	.468	.429	.441	.307
reflect on ot	.418	.438	.381	.445	.488	.393	.498
work alone and in team to effect service delivery	.568	.483	.570	.518	.396	.388	.399
know personal limits	1.000	.439	.463	.455	.468	.520	.460
Share knowledge	.439	1.000	.479	.416	.451	.474	.373
contribute to OT organization	.463	.479	1.000	.483	.370	.365	.411
self-management	.455	.416	.483	1.000	.505	.447	.349
understand principles of supervision	.468	.451	.370	.505	1.000	.705	.488
use supervision to promote competence	.520	.474	.365	.447	.705	1.000	.524
critique own and others performance	.460	.373	.411	.349	.488	.524	1.000
give, receive, respond to feedback	.530	.397	.453	.445	.524	.539	.571
work with change	.465	.463	.453	.440	.301	.325	.359
work to value base of OT	.353	.574	.402	.350	.453	.347	.347
ethical reasoning	.420	.464	.393	.357	.387	.362	.400
client centered attitudes	.344	.354	.225	.323	.363	.373	.304
theory to underpin OT	.330	.401	.388	.425	.314	.372	.356
prioritise referrals	.490	.337	.369	.497	.340	.335	.327
assessment and treat clients	.379	.398	.467	.456	.313	.296	.295
select theoretical frameworks	.244	.380	.350	.330	.402	.396	.341

	know personal limits	Share knowledge	contribute to OT organization	self-management	understand principles of supervision	use supervision to promote competence	critique own and others performance
Correlation							
uses and use assessment tools	.300	.373	.238	.330	.277	.309	.198
activity analysis	.402	.408	.314	.401	.422	.401	.337
empower service users	.497	.381	.447	.453	.445	.389	.391
assess risk	.518	.365	.422	.432	.396	.392	.452
select adapt and use therapeutic media	.391	.447	.338	.360	.358	.317	.246
health promotion and education	.055	.143	.451	.130	.149	.110	.247
evaluate own practice	.480	.443	.394	.355	.466	.397	.575
work with cultural groups	.314	.264	.293	.299	.298	.206	.320
maintain records	.376	.415	.329	.417	.243	.265	.271
appraise methods of service delivery	.297	.262	.328	.275	.255	.178	.369
professional conduct	.238	.128	.278	.177	.182	.275	.166
work safely as an OT	.484	.321	.372	.477	.398	.372	.393
work to code of ethics	.444	.362	.388	.399	.308	.297	.377
work to a specify relevant legislation	.303	.299	.300	.340	.266	.228	.313
work within legal, ethical and professional parameters	.368	.317	.317	.436	.280	.316	.373
take responsibility for actions	.452	.275	.474	.438	.439	.400	.396
recognise ill health in the work place in self and others	.403	.176	.310	.289	.335	.250	.306
apply audit	.256	.440	.380	.361	.330	.245	.268
draw on research and evidence	.286	.422	.478	.382	.347	.285	.389
develop and engage in CPD	.385	.414	.399	.417	.426	.435	.463

	know personal limits	Share knowledge	contribute to Organization	self-management	understand principles of supervision	use supervision to promote competence	critique own and others performance
Correlation self development of graduates develop others and the service	.417	.416	.429	.379	.432	.436	.442
	.241	.354	.430	.298	.362	.314	.312

Correlation	give, receive, respond to feedback	work with change	work to value base of OT	ethical reasoning	client centered attitudes	theory to underpin OT	prioritise referrals
describe unique perspective of OT	.201	.275	.417	.449	.372	.401	.242
reason effectively	.293	.433	.354	.440	.245	.456	.519
justify theoretical base	.210	.298	.410	.336	.209	.319	.340
justify OT to service needs and resources	.290	.325	.422	.491	.276	.505	.403
integrate knowledge and skills	.394	.421	.394	.376	.323	.386	.474
reflect on ot	.375	.308	.463	.513	.264	.395	.320
work alone and in team to effect service delivery	.479	.455	.357	.395	.377	.312	.505
know personal limits	.530	.465	.353	.420	.344	.330	.490
Share knowledge	.397	.463	.574	.464	.354	.401	.337
contribute to OTorganisation	.453	.453	.402	.393	.225	.388	.369
self-management	.445	.440	.350	.357	.323	.425	.497
understand principles of supervision	.524	.301	.453	.387	.363	.314	.340
use supervision to promote competence	.539	.325	.347	.362	.373	.372	.335
critique own and others performance	.571	.359	.347	.400	.304	.356	.327
give, receive, respond to feedback	1.000	.560	.293	.293	.323	.271	.386
work with change	.560	1.000	.395	.355	.308	.303	.506
work to value base of OT	.293	.395	1.000	.469	.327	.434	.321
ethical reasoning	.293	.355	.469	1.000	.391	.379	.403
client centered attitudes	.323	.308	.327	.391	1.000	.336	.217
theory to underpin OT	.271	.303	.434	.379	.336	1.000	.334
prioritise referrals	.386	.506	.321	.403	.217	.334	1.000
assessment and treat clients	.292	.369	.413	.325	.423	.383	.398
select theoretical frameworks	.250	.153	.461	.333	.332	.612	.137

Correlation	give, receive, respond to feedback	work with change	work to value base of OT	ethical reasoning	client centered attitudes	theory to underpin OT	prioritise referrals
useselect and use assesment tools	.171	.266	.320	.471	.424	.350	.370
activity analysis	.352	.306	.380	.425	.356	.329	.371
empower service users	.413	.404	.452	.501	.423	.278	.407
assess risk	.428	.355	.307	.462	.330	.296	.532
select adapt and use therapeutic media	.260	.468	.392	.397	.338	.422	.402
health promotion and education	.025	.169	.154	.127	.142	.092	.121
evaluate own practice	.478	.464	.420	.450	.450	.325	.380
work with cultural groups	.229	.334	.339	.342	.316	.280	.231
maintain records	.289	.477	.353	.425	.201	.278	.487
appraise methods of service delivery	.231	.345	.320	.423	.302	.260	.423
professional conduct	.314	.205	.323	.089	.151	.154	.216
work safely as an OT	.484	.464	.332	.348	.354	.364	.535
work to code of ethics	.452	.506	.345	.340	.309	.233	.402
work to a specify relevant legislation	.316	.336	.376	.373	.321	.300	.351
work within legal, ethical and professional parameters	.382	.397	.360	.462	.388	.361	.370
take responsibility for actions	.468	.451	.375	.435	.340	.372	.435
recognise ill health in the work place in self and others	.367	.271	.194	.349	.278	.219	.383
apply audit	.271	.359	.397	.329	.258	.377	.342
draw on research and evidence	.320	.317	.357	.373	.213	.358	.331
develop and engage in CPD	.377	.403	.376	.367	.261	.267	.321

Correlation Matrix

	give, receive, respond to feedback	work with change	work to value base of OT	ethical reasoning	client centered attitudes	theory to underpin OT	prioritise referrals
Correlation							
self development of graduates	.414	.427	.388	.402	.289	.317	.306
develop others and the service	.371	.283	.387	.275	.191	.299	.218

Correlation	assessment and treat clients	select theoretical frameworks	use select and use assessment tools	activity analysis	empower service users	assess risk	select adapt and use therapeutic media
describe unique perspective of OT	.341	.385	.371	.417	.401	.285	.356
reason effectively	.434	.300	.371	.413	.370	.421	.476
justify theoretical base	.224	.271	.356	.296	.305	.370	.283
justify OT to service needs and resource	.317	.460	.252	.329	.319	.310	.288
integrate knowledge and skills	.420	.342	.457	.407	.351	.407	.488
reflect on ot	.311	.429	.302	.405	.440	.423	.358
work alone and in team to effect service delivery	.487	.208	.308	.378	.483	.463	.448
know personal limits	.379	.244	.300	.402	.497	.518	.391
Share knowledge	.398	.380	.373	.408	.381	.365	.447
contribute to OT organisation	.467	.350	.238	.314	.447	.422	.338
self-management	.456	.330	.330	.401	.453	.432	.360
understand principles of supervision	.313	.402	.277	.422	.445	.396	.358
use supervision to promote competence	.296	.396	.309	.401	.389	.392	.317
critique own and others performance	.295	.341	.198	.337	.391	.452	.246
give, receive, respond to feedback	.292	.250	.171	.352	.413	.428	.260
work with change	.369	.153	.266	.306	.404	.355	.468
work to value base of OT	.413	.461	.320	.380	.452	.307	.392
ethical reasoning	.325	.333	.471	.425	.501	.462	.397
client centered attitudes	.423	.332	.424	.356	.423	.330	.338
theory to underpin OT	.383	.612	.350	.329	.278	.296	.422
prioritise referrals	.398	.137	.370	.371	.407	.532	.402
assessment and treat clients	1.000	.360	.416	.437	.515	.381	.449
select theoretical frameworks	.360	1.000	.361	.367	.286	.184	.391

	assessment and treat clients	select theoretical frameworks	use select and use assessment tools	activity analysis	empower service users	assess risk	select adapt and use therapeutic media
Correlation							
use select and use assessment tools	.416	.361	1.000	.460	.384	.391	.513
activity analysis	.437	.367	.460	1.000	.494	.432	.517
empower service users	.515	.286	.384	.494	1.000	.531	.395
assess risk	.381	.184	.391	.432	.531	1.000	.440
select adapt and use therapeutic media	.449	.391	.513	.517	.395	.440	1.000
health promotion and education	.137	.102	.104	.116	.184	.146	.153
evaluate own practice	.426	.378	.389	.498	.437	.438	.460
work with cultural groups	.319	.225	.323	.245	.342	.282	.322
maintain records	.374	.097	.347	.401	.478	.338	.291
appraise methods of service delivery	.315	.245	.350	.346	.434	.447	.321
professional conduct	.182	.057	.114	.285	.237	.163	.059
work safely as an OT	.506	.179	.334	.491	.504	.429	.384
work to code of ethics	.473	.133	.191	.402	.451	.392	.299
work to a specify relevant legislation	.392	.236	.333	.317	.348	.356	.232
work within legal, ethical and professional parameters	.436	.222	.344	.362	.461	.499	.318
take responsibility for actions	.462	.300	.302	.373	.459	.380	.262
recognise ill health in the work place in self and others	.266	.192	.289	.374	.419	.394	.213
apply audit	.420	.411	.407	.373	.346	.348	.422
draw on research and evidence	.384	.354	.207	.253	.271	.287	.351
develop and engage in CPD	.396	.254	.254	.371	.478	.377	.320

Correlation Matrix

	assessment and treat clients	select theoretical frameworks	use select and use assessment tools	activity analysis	empower service users	assess risk	select adapt and use therapeutic media
Correlation self development of graduates develop others and the service	.330	.302	.131	.202	.374	.356	.330
	.285	.389	.156	.216	.335	.153	.238

	health promotion and education	evaluate own practice	work with cultural groups	maintain records	appraise methods of service delivery	professional conduct	work safely as an OT
Correlation							
describe unique perspective of OT	.131	.468	.393	.247	.325	.085	.281
reason effectively	.148	.336	.203	.394	.282	.184	.506
justify theoretical base	.146	.354	.175	.404	.295	.253	.302
justify OT to service needs and resources	.095	.379	.259	.284	.370	.153	.308
integrate knowledge and skills	.130	.465	.233	.382	.314	.258	.459
reflect on ot	.143	.472	.359	.297	.402	.165	.341
work alone and in team to effect service delivery	.147	.365	.335	.359	.347	.300	.561
know personal limits	.055	.480	.314	.376	.297	.238	.484
Share knowledge	.143	.443	.264	.415	.262	.128	.321
contribute to OTorganisation	.451	.394	.293	.329	.328	.278	.372
self-management	.130	.355	.299	.417	.275	.177	.477
understand principles of supervision	.149	.466	.298	.243	.255	.182	.398
use supervision to promote competence	.110	.397	.206	.265	.178	.275	.372
critique own and others performance	.247	.575	.320	.271	.369	.166	.393
give, receive, respond to feedback	.025	.478	.229	.289	.231	.314	.484
work with change	.169	.464	.334	.477	.345	.205	.464
work to value base of OT	.154	.420	.339	.353	.320	.323	.332
ethical reasoning	.127	.450	.342	.425	.423	.089	.348
client centered attitudes	.142	.450	.316	.201	.302	.151	.354
theory to underpin OT	.092	.325	.280	.278	.260	.154	.364
prioritise referrals	.121	.380	.231	.487	.423	.216	.535
assessment and treat clients	.137	.426	.319	.374	.315	.182	.506
select theoretical frameworks	.102	.378	.225	.097	.245	.057	.179

	health promotion and education	evaluate own practice	work with cultural groups	maintain records	appraise methods of service delivery	professional conduct	work safely as an OT
Correlation							
use select and use assessment tools	.104	.389	.323	.347	.350	.114	.334
activity analysis	.116	.498	.245	.401	.346	.285	.491
empower service users	.184	.437	.342	.478	.434	.237	.504
assess risk	.146	.438	.282	.338	.447	.163	.429
select adapt and use therapeutic media	.153	.460	.322	.291	.321	.059	.384
health promotion and education	1.000	.205	.162	.152	.281	.053	.155
evaluate own practice	.205	1.000	.387	.334	.492	.148	.419
work with cultural groups	.162	.387	1.000	.325	.289	.212	.293
maintain records	.152	.334	.325	1.000	.361	.209	.468
appraise methods of service delivery	.281	.492	.289	.361	1.000	.028	.334
professional conduct	.053	.148	.212	.209	.028	1.000	.391
work safely as an OT	.155	.419	.293	.468	.334	.391	1.000
work to code of ethics	.025	.402	.280	.428	.242	.385	.788
work to a specify relevant legislation	.018	.434	.319	.336	.392	.298	.466
work within legal, ethical and professional parameters	.132	.471	.377	.392	.326	.250	.592
take responsibility for actions	.038	.506	.360	.298	.374	.355	.607
recognise ill health in the work place in self and others	.148	.420	.274	.326	.391	.253	.446
apply audit	.259	.425	.335	.313	.507	.172	.317
draw on research and evidence	.235	.393	.241	.245	.350	.274	.356
develop and engage in CPD	.137	.438	.436	.425	.312	.246	.497

	health promotion and education	evaluate own practice	work with cultural groups	maintain records	appraise methods of service delivery	professional conduct	work safely as an OT
Correlation self development of graduates develop others and the service	.129	.417	.281	.296	.287	.212	.437
	.112	.256	.285	.272	.247	.339	.318

	work to code of ethics	work to a specify relevant legislation	work within legal,ethical and professional parameters	take responsibility for actions	recognise ill health in the work place in self and others	apply audit	draw on research and evidence
Correlation							
describe unique perspective of OT	.229	.256	.350	.327	.193	.263	.206
reason effectively	.414	.282	.326	.358	.301	.270	.421
justify theoretical base	.264	.234	.224	.261	.280	.255	.307
justify OT to service needs and resourcess	.287	.322	.329	.384	.211	.272	.370
integrate knowledge and skills	.387	.396	.420	.433	.245	.392	.302
reflect on ot	.352	.303	.328	.348	.306	.386	.440
work alone and in team to effect service delivery	.454	.303	.415	.433	.336	.303	.397
know personal limits	.444	.303	.368	.452	.403	.256	.286
Share knowledge	.362	.299	.317	.275	.176	.440	.422
contribute to OTorganisation	.388	.300	.317	.474	.310	.380	.478
self-management	.399	.340	.436	.438	.289	.361	.382
understand principles of supervision	.308	.266	.280	.439	.335	.330	.347
use supervision to promote competence	.297	.228	.316	.400	.250	.245	.285
critique own and others performance	.377	.313	.373	.396	.306	.268	.389
give,recieve,respond to feedback	.452	.316	.382	.468	.367	.271	.320
work with change	.506	.336	.397	.451	.271	.359	.317
work to value base of OT	.345	.376	.360	.375	.194	.397	.357
ethical reasoning	.340	.373	.462	.435	.349	.329	.373
client centered attitudes	.309	.321	.388	.340	.278	.258	.213
theory to underpin OT	.233	.300	.361	.372	.219	.377	.358
prioritise referrals	.402	.351	.370	.435	.383	.342	.331
assessment and treat clients	.473	.392	.436	.462	.266	.420	.384
select theoretical frameworks	.133	.236	.222	.300	.192	.411	.354

Correlation	work to code of ethics	work to a specify relevant legislation	work within legal, ethical and professional parameters	take responsibility for actions	recognise ill health in the work place in self and others	apply audit	draw on research and evidence
use select and use assessment tools	.191	.333	.344	.302	.289	.407	.207
activity analysis	.402	.317	.362	.373	.374	.373	.253
empower service users	.451	.348	.461	.459	.419	.346	.271
assess risk	.392	.356	.499	.380	.394	.348	.287
select adapt and use therapeutic media	.299	.232	.318	.262	.213	.422	.351
health promotion and education	.025	.018	.132	.038	.148	.259	.235
evaluate own practice	.402	.434	.471	.506	.420	.425	.393
work with cultural groups	.280	.319	.377	.360	.274	.335	.241
maintain records	.428	.336	.392	.298	.326	.313	.245
appraise methods of service delivery	.242	.392	.326	.374	.391	.507	.350
professional conduct	.385	.298	.250	.355	.253	.172	.274
work safely as an OT	.788	.466	.592	.607	.446	.317	.356
work to code of ethics	1.000	.523	.599	.563	.386	.269	.398
work to a specify relevant legislation	.523	1.000	.639	.500	.408	.424	.322
work within legal, ethical and professional parameters	.599	.639	1.000	.602	.401	.360	.336
take responsibility for actions	.563	.500	.602	1.000	.560	.381	.355
recognise ill health in the work place in self and others	.386	.408	.401	.560	1.000	.394	.191
apply audit	.269	.424	.360	.381	.394	1.000	.445
draw on research and evidence	.398	.322	.336	.355	.191	.445	1.000
develop and engage in CPD	.497	.339	.380	.449	.287	.379	.454

Correlation Matrix

	work to code of ethics	work to a specify relevant legislation	work within legal, ethical and professional parameters	take responsibility for actions	recognise ill health in the work place in self and others	apply audit	draw on research and evidence
Correlation							
self development of graduates	.466	.326	.391	.541	.375	.397	.402
develop others and the service	.350	.304	.256	.406	.357	.453	.350

Correlation	develop and engage in CPD	self development of graduates	develop others and the service
describe unique perspective of OT	.292	.324	.231
reason effectively	.311	.370	.308
justify theoretical base	.380	.284	.229
justify OT to service needs and resourcess	.328	.363	.301
integrate knowledge and skills	.337	.378	.296
reflect on ot	.513	.426	.394
work alone and in team to effect service delivery	.401	.401	.330
know personal limits	.385	.417	.241
Share knowledge	.414	.416	.354
contribute to OTorganisation	.399	.429	.430
self-management	.417	.379	.298
understand principles of supervision	.426	.432	.362
use supervision to promote competence	.435	.436	.314
critique own and others performance	.463	.442	.312
give, recieve, respond to feedback	.377	.414	.371
work with change	.403	.427	.283
work to value base of OT	.376	.388	.387
ethical reasoning	.367	.402	.275
client centered attitudes	.261	.289	.191
theory to underpin OT	.267	.317	.299
prioritise referrals	.321	.306	.218
asesment and treat clients	.396	.330	.285
select theoretical frameworks	.254	.302	.389

	develop and engage in CPD	self development of graduates	develop others and the service
Correlation			
use select and use assessment tools	.254	.131	.156
activity analysis	.371	.202	.216
empower service users	.478	.374	.335
assess risk	.377	.356	.153
select adapt and use therapeutic media	.320	.330	.238
health promotion and education	.137	.129	.112
evaluate own practice	.438	.417	.256
work with cultural groups	.436	.281	.285
maintain records	.425	.296	.272
appraise methods of service delivery	.312	.287	.247
professional conduct	.246	.212	.339
work safely as an OT	.497	.437	.318
work to code of ethics	.497	.466	.350
work to a specify relevant legislation	.339	.326	.304
work within legal, ethical and professional parameters	.380	.391	.256
take responsibility for actions	.449	.541	.406
recognise ill health in the work place in self and others	.287	.375	.357
apply audit	.379	.397	.453
draw on research and evidence	.454	.402	.350
develop and engage in CPD	1.000	.555	.391

		develop and engage in CPD	self development of graduates	develop others and the service
Correlation	self development of graduates	.555	1.000	.639
	develop others and the service	.391	.639	1.000

Communalities

	Initial	Extraction
describe unique perspective of OT	1.000	.644
reason effectively	1.000	.761
justify theoretical base	1.000	.724
justify OT to service needs and resourcess	1.000	.709
integrate knowledge and skills	1.000	.583
reflect on ot	1.000	.597
work alone and in team to effect service delivery	1.000	.637
know personal limits	1.000	.631
Share knowledge	1.000	.678
contribute to OTorganisation	1.000	.745
self-management	1.000	.564
understand principles of supervision	1.000	.703
use supervision to promote competence	1.000	.749
critique own and others performance	1.000	.691
give, recieve, respond to feedback	1.000	.692
work with change	1.000	.614

Extraction Method: Principal Component Analysis.

	Initial	Extraction
work to value base of OT	1.000	.611
ethical reasoning	1.000	.607
client centered attitudes	1.000	.549
theory to underpin OT	1.000	.647
prioritise referrals	1.000	.676
assessment and treat clients	1.000	.637
select theoretical frameworks	1.000	.766
use select and use assessment tools	1.000	.684
activity analysis	1.000	.591
empower service users	1.000	.586
assess risk	1.000	.611
select adapt and use therapeutic media	1.000	.663
health promotion and education	1.000	.800
evaluate own practice	1.000	.619
work with cultural groups	1.000	.506
maintain records	1.000	.640
appraise methods of service delivery	1.000	.697
professional conduct	1.000	.736
work safely as an OT	1.000	.746
work to code of ethics	1.000	.753
work to a specify relevant legislation	1.000	.634
work within legal, ethical and professional parameters	1.000	.691
take responsibility for actions	1.000	.713
recognise ill health in the work place in self and others	1.000	.687
apply audit	1.000	.779

Extraction Method: Principal Component Analysis.

	Initial	Extraction
draw on research and evidence	1.000	.534
develop and engage in CPD	1.000	.620
self development of graduates	1.000	.664
develop others and the service	1.000	.683

Extraction Method: Principal Component Analysis.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	16.735	37.188	37.188	16.735	37.188	37.188	4.202	9.338	9.338
2	2.250	5.001	42.189	2.250	5.001	42.189	4.200	9.334	18.672
3	1.876	4.168	46.357	1.876	4.168	46.357	4.103	9.118	27.790
4	1.609	3.576	49.933	1.609	3.576	49.933	3.278	7.285	35.074
5	1.523	3.385	53.318	1.523	3.385	53.318	3.168	7.040	42.114
6	1.430	3.177	56.495	1.430	3.177	56.495	2.746	6.103	48.217
7	1.192	2.649	59.144	1.192	2.649	59.144	2.692	5.983	54.201
8	1.116	2.480	61.624	1.116	2.480	61.624	2.168	4.818	59.019
9	1.101	2.446	64.069	1.101	2.446	64.069	1.744	3.875	62.894
10	1.023	2.274	66.343	1.023	2.274	66.343	1.552	3.450	66.343
11	.929	2.064	68.407						
12	.873	1.940	70.347						
13	.832	1.848	72.195						
14	.783	1.740	73.934						
15	.772	1.715	75.649						
16	.741	1.646	77.296						
17	.659	1.464	78.759						
18	.639	1.421	80.180						
19	.600	1.334	81.514						
20	.574	1.276	82.790						

Extraction Method: Principal Component Analysis.

Component	Initial Eigenvalues		Extraction Sums of Squared Loadings		Rotation Sums of Squared Loadings	
	Total	% of Variance	Total	% of Variance	Total	Cumulative %
21	.565	1.256				84.045
22	.535	1.189				85.234
23	.509	1.131				86.365
24	.469	1.043				87.408
25	.459	1.019				88.427
26	.427	.949				89.377
27	.406	.902				90.279
28	.401	.890				91.169
29	.375	.833				92.002
30	.340	.756				92.757
31	.326	.723				93.481
32	.318	.706				94.187
33	.296	.659				94.846
34	.285	.634				95.480
35	.267	.594				96.074
36	.257	.570				96.644
37	.233	.519				97.163
38	.215	.479				97.641
39	.204	.453				98.095
40	.191	.423				98.518
41	.178	.394				98.913
42	.162	.360				99.273
43	.136	.301				99.574
44	.115	.256				99.830
45	7.635E-02	.170				100.000

Extraction Method: Principal Component Analysis.

Reliability

RELIABILITY ANALYSIS - SCALE 1 (ALPHA)

- 1. SUPERVIS understand principles of supervision
- 2. USESUPER use supervision to promote competence
- 3. CRITIQUE critique own and others performance
- 4. FEEDBACK give, recieve, respond to feedback
- 5. LIMITS know personal limits
- 6. EVALUATE evaluate own practice

N of Cases = 185.0

Statistics for Scale	Mean	Variance	Std Dev	N of Variables
	10.2919	7.4361	2.7269	6

Analysis of Variance

Source of Variation	Sum of Sq.	DF	Mean Square	F	Prob.
Between People	228.0396	184	1.2393		
Within People	166.0000	925	.1795		
Between Measures	9.7153	5	1.9431	11.4382	.0000
Residual	156.2847	920	.1699		
Total	394.0396	1109	.3553		
Grand Mean	1.7153				

Hotelling's T-Squared = 52.1356 F = 10.2004 Prob. = .0000
 Degrees of Freedom: Numerator = 5 Denominator = 180

Reliability Coefficients 6 items

Alpha = .8629 Standardized item alpha = .8630

Reliability

RELIABILITY ANALYSIS - SCALE 2 (ALPHA)

1. CHANGE work with change
2. PRIORITY prioritise referrals
3. EFFECT work alone and in team to effect service
4. REASON reason effectively
5. SELFMGT self-management
6. SHARE Share knowledge
7. CONTRIBU contribute to OTOrganisation
8. RECORDS maintain records

N of Cases = 166.0

Statistics for	Mean	Variance	Std Dev	N of Variables
Scale	14.0241	11.2721	3.3574	8

Analysis of Variance

Source of Variation	Sum of Sq.	DF	Mean Square	F	Prob.
Between People	232.4880	165	1.4090		
Within People	232.5000	1162	.2001		
Between Measures	9.7349	7	1.3907	7.2106	.0000
Residual	222.7651	1155	.1929		
Total	464.9880	1327	.3504		
Grand Mean	1.7530				

Hotelling's T-Squared = 63.3753 F = 8.7244 Prob. = .0000
 Degrees of Freedom: Numerator = 7 Denominator = 159

Reliability Coefficients 8 items

Alpha = .8631 Standardized item alpha = .8631

Reliability

RELIABILITY ANALYSIS - SCALE 3 (ALPHA)

- 1. AUTOMOMY take responsibility for actions
- 2. CODE work to code of ethics
- 3. LEGAL work within legal, ethical and profession
- 4. SAFETY work safely as an OT
- 5. LEGISLAT work to a specify relevant legislation
- 6. CONDUCT professional conduct

N of Cases = 187.0

Statistics for Scale	Mean	Variance	Std Dev	N of Variables
	9.6417	7.2527	2.6931	6

Analysis of Variance

Source of Variation	Sum of Sq.	DF	Mean Square	F	Prob.
Between People	224.8324	186	1.2088		
Within People	204.8333	935	.2191		
Between Measures	11.2166	5	2.2433	10.7753	.0000
Residual	193.6168	930	.2082		
Total	429.6658	1121	.3833		
Grand Mean	1.6070				

Hotelling's T-Squared = 62.7739 F = 12.2848 Prob. = .0000

Degrees of Freedom: Numerator = 5 Denominator = 182

Reliability Coefficients 6 items

Alpha = .8278 Standardized item alpha = .8570

Reliability

RELIABILITY ANALYSIS - SCALE 4 (ALPHA)

- 1. OTMEDIA select adapt and use therapeutic media
- 2. ANALYSIS activity analysis
- 3. ASSESS use select and use assesment tools
- 4. PROCESS asesment and treat clients
- 5. INTEGRAT integrate knowledge and skills
- 6. ATTITUDE client centered attitudes

N of Cases = 166.0

Statistics for Scale	Mean	Variance	Std Dev	N of Variables
	11.1386	5.8534	2.4194	6

Analysis of Variance

Source of Variation	Sum of Sq.	DF	Mean Square	F	Prob.
Between People	160.9689	165	.9756		
Within People	159.5000	830	.1922		
Between Measures	11.3183	5	2.2637	12.6029	.0000
Residual	148.1817	825	.1796		
Total	320.4689	995	.3221		
Grand Mean	1.8564				

Hotelling's T-Squared = 52.1901 F = 10.1850 Prob. = .0000
 Degrees of Freedom: Numerator = 5 Denominator = 161

Reliability Coefficients 6 items

Alpha = .8159 Standardized item alpha = .8177

Reliability

RELIABILITY ANALYSIS - SCALE 5 (ALPHA)

1. THEOBASE justify theoretical base
2. THEORY2 select theoretical frameworks
3. THEORY theory to underpin OT
4. JUSTIFY justify OT to service needs and resource

N of Cases = 177.0

Statistics for	Mean	Variance	Std Dev	N of
Scale	7.9040	3.1669	1.7796	Variables
				4

Analysis of Variance

Source of Variation	Sum of Sq.	DF	Mean Square	F	Prob.
Between People	139.3418	176	.7917		
Within People	121.2500	531	.2283		
Between Measures	16.8856	3	5.6285	28.4758	.0000
Residual	104.3644	528	.1977		
Total	260.5918	707	.3686		
Grand Mean	1.9760				

Hotelling's T-Squared =	66.7255	F =	21.9891	Prob. =	.0000
Degrees of Freedom:		Numerator =	3	Denominator =	174

Reliability Coefficients 4 items

Alpha = .7503 Standardized item alpha = .7457

Reliability

RELIABILITY ANALYSIS - SCALE 6 (ALPHA)

1. AUDIT apply audit
2. SELFDEV self development of graduates
3. DEVELOP develop others and the service
4. RESEARCH draw on research and evidence

N of Cases = 177.0

Statistics for	Mean	Variance	Std Dev	N of
Scale	7.8023	3.0914	1.7582	Variables
				4

Analysis of Variance

Source of Variation	Sum of Sq.	DF	Mean Square	F	Prob.
Between People	136.0198	176	.7728		
Within People	111.2500	531	.2095		
Between Measures	15.1681	3	5.0560	27.7844	.0000
Residual	96.0819	528	.1820		
Total	247.2698	707	.3497		
Grand Mean	1.9506				

Hotelling's T-Squared =	79.2262	F =	26.1086	Prob. =	.0000
Degrees of Freedom:		Numerator =	3	Denominator =	174

Reliability Coefficients 4 items

Alpha = .7645 Standardized item alpha = .7641

Reliability

RELIABILITY ANALYSIS - SCALE 7 (ALPHA)

- 1. CPD develop and engage in CPD
- 2. CULTURE work with cultural groups
- 3. EMPOWER empower service users
- 4. REFLECT reflect on ot
- 5. UNIQUE describe unique perspective of OT
- 6. ETHICS ethical reasoning
- 7. VALUES work to value base of OT

N of Cases = 161.0

Statistics for Scale	Mean	Variance	Std Dev	N of Variables
	12.2422	8.2597	2.8740	7

Analysis of Variance

Source of Variation	Sum of Sq.	DF	Mean Square	F	Prob.
Between People	188.7933	160	1.1800		
Within People	183.1429	966	.1896		
Between Measures	6.7063	6	1.1177	6.0816	.0000
Residual	176.4366	960	.1838		
Total	371.9361	1126	.3303		
Grand Mean	1.7489				

Hotelling's T-Squared = 38.7139 F = 6.2507 Prob. = .0000
 Degrees of Freedom: Numerator = 6 Denominator = 155

Reliability Coefficients 7 items

Alpha = .8442 Standardized item alpha = .8480

RELIABILITY ANALYSIS - SCALE 8 (ALPHA)

- 1. APPRAISE appraise methods of service delivery
- 2. HEALTH recognise ill health in the work place i
- 3. RISK assess risk

N of Cases = 186.0

Statistics for Scale	Mean	Variance	Std Dev	N of Variables
	5.6613	1.6522	1.2854	3

Analysis of Variance

Source of Variation	Sum of Sq.	DF	Mean Square	F	Prob.
Between People	101.8871	185	.5507		
Within People	78.0000	372	.2097		
Between Measures	11.8172	2	5.9086	33.0325	.0000
Residual	66.1828	370	.1789		
Total	179.8871	557	.3230		
Grand Mean	1.8871				

Hottelling's T-Squared = 67.3407 F = 33.4883 Prob. = .0000
 Degrees of Freedom: Numerator = 2 Denominator = 184

Reliability Coefficients 3 items

Alpha = .6752 Standardized item alpha = .6756

status = graduate

Mann-Whitney Test

Ranks^a

	age category	N	Mean Rank	Sum of Ranks
ONE	under 21	41	55.29	2267.00
	over 21	57	45.33	2584.00
	Total	98		
TWO	under 21	42	56.70	2381.50
	over 21	58	46.01	2668.50
	Total	100		
THREE	under 21	42	51.71	2172.00
	over 21	58	49.62	2878.00
	Total	100		
FOUR	under 21	42	53.52	2248.00
	over 21	57	47.40	2702.00
	Total	99		
FIVE	under 21	42	60.33	2534.00
	over 21	58	43.38	2516.00
	Total	100		
SIX	under 21	42	57.29	2406.00
	over 21	58	45.59	2644.00
	Total	100		
SEVEN	under 21	40	58.35	2334.00
	over 21	58	43.40	2517.00
	Total	98		
EIGHT	under 21	42	52.69	2213.00
	over 21	58	48.91	2837.00
	Total	100		

a. status = graduate

- Mann Whitney U test of age and un-weighted sub-scale scores

	ONE	TWO	THREE	FOUR	FIVE	SIX	SEVEN	EIGHT
Mann-Whitney U	931.000	957.500	1167.000	1049.000	805.000	933.000	806.000	1126.000
Wilcoxon W	2584.000	2668.500	2878.000	2702.000	2516.000	2644.000	2517.000	2837.000
Z	-1.728	-1.831	-.362	-1.059	-2.974	-2.046	-2.585	-.669
Asymp. Sig. (2-tailed)	.084	.067	.718	.290	.003	.041	.010	.504

a. Grouping Variable: age category

b. status = graduate

status = employer

Mann-Whitney Test

age category	N	Mean Rank	Sum of Ranks
ONE			
under 21	40	46.45	1858.00
over 21	47	41.91	1970.00
Total	87		
TWO			
under 21	40	47.67	1907.00
over 21	48	41.85	2009.00
Total	88		
THREE			
under 21	40	46.33	1853.00
over 21	49	43.92	2152.00
Total	89		
FOUR			
under 21	38	45.11	1714.00
over 21	48	42.23	2027.00
Total	86		
FIVE			
under 21	40	43.89	1755.50
over 21	47	44.10	2072.50
Total	87		
SIX			
under 21	40	47.64	1905.50
over 21	46	39.90	1835.50
Total	86		
SEVEN			
under 21	39	47.28	1844.00
over 21	47	40.36	1897.00
Total	86		
EIGHT			
under 21	39	46.40	1809.50
over 21	49	42.99	2106.50
Total	88		

a. status = employer

Test Statistics^{a,b}

	ONE	TWO	THREE	FOUR	FIVE	SIX	SEVEN	EIGHT
Mann-Whitney U	842.000	833.000	927.000	851.000	935.500	754.500	769.000	881.500
Wilcoxon W	1970.000	2009.000	2152.000	2027.000	1755.500	1835.500	1897.000	2106.500
Z	-.845	-1.075	-.454	-.541	-.040	-1.542	-1.294	-.649
Asymp. Sig. (2-tailed)	.398	.282	.650	.588	.968	.123	.196	.516

a. Grouping Variable: age category

b. status = employer

T-Test

status = graduate

Group Statistics^a

age category		N	Mean	Std. Deviation	Std. Error Mean
BART factor score	analysis				
1 for	under 21	25	7.17E-02	1.1601144	.2320229
1	over 21	39	-.1976551	.7892705	.1263844
2 for	under 21	25	-.4908837	1.1031579	.2206316
1	over 21	39	-.1659564	.9131655	.1462235
3 for	under 21	25	-.3807199	1.1677962	.2335592
1	over 21	39	-.1977770	.9985301	.1598928
4 for	under 21	25	-5.26E-02	1.2223181	.2444636
1	over 21	39	-1.75E-02	.9465149	.1515637
5 for	under 21	25	.2198268	.9382865	.1876573
1	over 21	39	8.64E-02	1.2188831	.1951775
6 for	under 21	25	.2529930	1.2610784	.2522157
1	over 21	39	5.13E-02	.8823861	.1412949
7 for	under 21	25	4.94E-02	1.2263171	.2452634
1	over 21	39	-.1727118	1.0774580	.1725314
8 for	under 21	25	-.2327037	1.1899326	.2379865
1	over 21	39	-.2654530	.8968319	.1436080

a. status = graduate

- Repeat test : t test of age and weighted Bartlett factor sub-scale score

		Levene's Test for Equality of Variances	
		F	Sig.
BART factor score 1 for analysis 1	Equal variances assumed Equal variances not assumed	3.600	.062
BART factor score 2 for analysis 1	Equal variances assumed Equal variances not assumed	.639	.427
BART factor score 3 for analysis 1	Equal variances assumed Equal variances not assumed	.526	.471
BART factor score 4 for analysis 1	Equal variances assumed Equal variances not assumed	2.474	.121
BART factor score 5 for analysis 1	Equal variances assumed Equal variances not assumed	.437	.511
BART factor score 6 for analysis 1	Equal variances assumed Equal variances not assumed	2.238	.140
BART factor score 7 for analysis 1	Equal variances assumed Equal variances not assumed	.331	.567
BART factor score 8 for analysis 1	Equal variances assumed Equal variances not assumed	.826	.367

		t-test for Equality of Means						
	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference		
						Lower	Upper	
BART factor score 1 for analysis 1	1.107	62	.273	.2693925	.2434335	-.2172241	.7560091	
	1.020	38.229	.314	.2693925	.2642114	-.2653702	.8041551	
BART factor score 2 for analysis 1	-1.280	62	.205	-.3249273	.2539097	-.8324857	.1826311	
	-1.228	44.314	.226	-.3249273	.2646878	-.8582637	.2084091	
BART factor score 3 for analysis 1	-.669	62	.506	-.1829429	.2734327	-.7295272	.3636414	
	-.646	45.461	.521	-.1829429	.2830470	-.7528694	.3869836	
BART factor score 4 for analysis 1	-.129	62	.898	-3.506E-02	.2720411	-.5788608	.5087440	
	-.122	42.070	.904	-3.506E-02	.2876352	-.6155010	.5453842	
BART factor score 5 for analysis 1	.466	62	.643	.1334414	.2866027	-.4394693	.7063520	
	.493	59.807	.624	.1334414	.2707573	-.4081898	.6750725	
BART factor score 6 for analysis 1	.753	62	.454	.2016537	.2678313	-.3337335	.7370409	
	.698	39.002	.490	.2016537	.2890968	-.3830989	.7864063	
BART factor score 7 for analysis 1	.762	62	.449	.2220901	.2914062	-.3604225	.8046027	
	.741	46.446	.463	.2220901	.2998687	-.3813577	.8255379	
BART factor score 8 for analysis 1	.125	62	.901	3.275E-02	.2614131	-.4898080	.5553065	
	.118	41.209	.907	3.275E-02	.2779584	-.5285124	.5940110	

a. status = graduate

status = employer

		age category	N	Mean	Std. Deviation	Std. Error Mean
BART factor score 1 for analysis 1	1 for under 21	under 21	22	1.75E-02	.6614128	.1410137
	2 for over 21	over 21	31	3.60E-02	1.1832036	.2125096
BART factor score 2 for analysis 1	1 for under 21	under 21	22	.6225104	.8109850	.1729026
	2 for over 21	over 21	31	.4674129	.9575556	.1719821
BART factor score 3 for analysis 1	1 for under 21	under 21	22	1.80E-02	.7517922	.1602826
	2 for over 21	over 21	31	.2326992	.7773718	.1396201
BART factor score 4 for analysis 1	1 for under 21	under 21	22	-.2402535	.9662181	.2059984
	2 for over 21	over 21	31	2.13E-02	1.1244442	.2019561
BART factor score 5 for analysis 1	1 for under 21	under 21	22	-.1171117	.9704212	.2068945
	2 for over 21	over 21	31	6.16E-02	.8827108	.1585395
BART factor score 6 for analysis 1	1 for under 21	under 21	22	-.2116448	1.0199929	.2174632
	2 for over 21	over 21	31	-.4958097	.9735258	.1748504
BART factor score 7 for analysis 1	1 for under 21	under 21	22	-2.48E-02	.8213779	.1751183
	2 for over 21	over 21	31	6.83E-02	.8952759	.1607963
BART factor score 8 for analysis 1	1 for under 21	under 21	22	.3003040	.6898254	.1470713
	2 for over 21	over 21	31	.1061530	1.1004606	.1976486

a. status = employer

		Levene's Test for Equality of Variances	
		F	Sig.
BART factor score 1 for analysis 1	Equal variances assumed Equal variances not assumed	5.813	.020
BART factor score 2 for analysis 1	Equal variances assumed Equal variances not assumed	.075	.785
BART factor score 3 for analysis 1	Equal variances assumed Equal variances not assumed	.036	.849
BART factor score 4 for analysis 1	Equal variances assumed Equal variances not assumed	.133	.717
BART factor score 5 for analysis 1	Equal variances assumed Equal variances not assumed	.267	.608
BART factor score 6 for analysis 1	Equal variances assumed Equal variances not assumed	.170	.682
BART factor score 7 for analysis 1	Equal variances assumed Equal variances not assumed	.084	.773
BART factor score 8 for analysis 1	Equal variances assumed Equal variances not assumed	2.171	.147

		t-test for Equality of Means						
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
							Lower	Upper
BART factor score 1 for analysis 1	Equal variances assumed Equal variances not assumed	-.066 -.072	51 48.737	.948 .943	-1.844E-02 -1.844E-02	.2792775 .2550396	-.5791096 -.5310280	.5422363 .4941546
BART factor score 2 for analysis 1	Equal variances assumed Equal variances not assumed	.618 .636	51 49.317	.539 .528	.1550976 .1550976	.2509202 .2438711	-.3486457 -.3349000	.6588409 .6450952
BART factor score 3 for analysis 1	Equal variances assumed Equal variances not assumed	-1.004 -1.010	51 46.300	.320 .318	-.2147403 -.2147403	.2138004 .2125660	-.6439625 -.6425387	.2144819 .2130581
BART factor score 4 for analysis 1	Equal variances assumed Equal variances not assumed	-.883 -.907	51 49.049	.381 .369	-.2615249 -.2615249	.2960955 .2884816	-.8559615 -.8412356	.3329117 .3181857
BART factor score 5 for analysis 1	Equal variances assumed Equal variances not assumed	-.697 -.686	51 42.617	.489 .497	-.1786951 -.1786951	.2564237 .2606533	-.6934872 -.7044892	.3360970 .3470990
BART factor score 6 for analysis 1	Equal variances assumed Equal variances not assumed	1.027 1.018	51 44.044	.309 .314	.2841649 .2841649	.2767969 .2790393	-.2715280 -.2781860	.8398578 .8465158
BART factor score 7 for analysis 1	Equal variances assumed Equal variances not assumed	-.386 -.392	51 47.636	.701 .697	-9.315E-02 -9.315E-02	.2413064 .2377433	-.5775930 -.5712596	.3912927 .3849593
BART factor score 8 for analysis 1	Equal variances assumed Equal variances not assumed	.731 .788	51 50.362	.468 .434	.1941509 .1941509	.2656814 .2463634	-.3392267 -.3005964	.7275285 .6888982

a. status = employer

- Kruskal- Wallis ANOVA on type of education and un-weighted sub-scale scores

status = graduate

Kruskal-Wallis Test

Ranks^a

	award	N	Mean Rank
ONE	BSc/BA 3 year full-time	82	49.99
	BSc/BA 4 year full time	2	31.50
	In-service degree	8	51.94
	Post grad diploma	5	57.20
	BSc4 year part time	3	62.00
	Total	100	
TWO	BSc/BA 3 year full-time	84	50.21
	BSc/BA 4 year full time	2	31.75
	In-service degree	8	52.56
	Post grad diploma	5	62.90
	BSc4 year part time	3	79.00
	Total	102	
THREE	BSc/BA 3 year full-time	84	49.20
	BSc/BA 4 year full time	2	46.00
	In-service degree	8	56.56
	Post grad diploma	5	73.50
	BSc4 year part time	3	69.33
	Total	102	

award	N	Mean Rank
FOUR		
BSc/BA 3 year full-time	83	51.89
BSc/BA 4 year full time	2	24.00
In-service degree	8	38.56
Post grad diploma	5	55.50
BSc4 year part time	3	70.17
Total	101	
FIVE		
BSc/BA 3 year full-time	84	51.90
BSc/BA 4 year full time	2	37.50
In-service degree	8	46.56
Post grad diploma	5	51.10
BSc4 year part time	3	63.50
Total	102	
SIX		
BSc/BA 3 year full-time	84	51.87
BSc/BA 4 year full time	2	52.00
In-service degree	8	45.25
Post grad diploma	5	56.90
BSc4 year part time	3	48.50
Total	102	
SEVEN		
BSc/BA 3 year full-time	83	50.55
BSc/BA 4 year full time	1	22.00
In-service degree	8	50.19
Post grad diploma	5	55.80
BSc4 year part time	3	50.67
Total	100	

award	N	Mean Rank
EIGHT BSc/BA 3 year full-time	84	51.24
BSc/BA 4 year full time	2	16.50
In-service degree	8	52.31
Post grad diploma	5	64.00
BSc4 year part time	3	59.00
Total	102	

a. status = graduate

Test Statistics^{a,b,c}

	ONE	TWO	THREE	FOUR	FIVE	SIX	SEVEN	EIGHT
Chi-Square	1.674	4.451	4.803	4.708	1.251	.601	1.156	4.238
df	4	4	4	4	4	4	4	4
Asymp. Sig.	.795	.348	.308	.319	.870	.963	.885	.375

a. Kruskal Wallis Test

b. Grouping Variable: award

c. status = graduate

status = employer

Kruskal-Wallis Test

Ranks^a

award	N	Mean Rank
ONE BSc/BA 3 year full-time	74	45.59
BSc/BA 4 year full time	1	39.50
In-service degree	7	26.71
Post grad diploma	2	33.25
BSc4 year part time	2	37.25

	award	N	Mean Rank
ONE	Total	86	
TWO	BSc/BA 3 year full-time	75	45.10
	BSc/BA 4 year full time	1	50.00
	In-service degree	7	37.93
	Post grad diploma	2	31.00
	BSc4 year part time	2	34.00
	Total	87	
THREE	BSc/BA 3 year full-time	75	44.73
	BSc/BA 4 year full time	1	60.00
	In-service degree	8	40.69
	Post grad diploma	2	45.75
	BSc4 year part time	2	42.25
	Total	88	
FOUR	BSc/BA 3 year full-time	73	45.16
	BSc/BA 4 year full time	1	28.50
	In-service degree	7	26.93
	Post grad diploma	2	38.50
	BSc4 year part time	2	32.25
	Total	85	
FIVE	BSc/BA 3 year full-time	74	44.61
	BSc/BA 4 year full time	1	48.50
	In-service degree	7	31.36
	Post grad diploma	2	48.50
	BSc4 year part time	2	37.50
	Total	86	

	award	N	Mean Rank
SIX	BSc/BA 3 year full-time	73	43.76
	BSc/BA 4 year full time	1	70.00
	In-service degree	7	30.64
	Post grad diploma	2	44.00
	BSc4 year part time	2	44.00
	Total	85	
SEVEN	BSc/BA 3 year full-time	73	44.71
	BSc/BA 4 year full time	1	55.50
	In-service degree	7	28.93
	Post grad diploma	2	30.50
	BSc4 year part time	2	36.25
	Total	85	
EIGHT	BSc/BA 3 year full-time	74	44.75
	BSc/BA 4 year full time	1	67.50
	In-service degree	8	32.13
	Post grad diploma	2	54.50
	BSc4 year part time	2	41.50
	Total	87	

a. status = employer

Test Statistics^{a,b,c}

	ONE	TWO	THREE	FOUR	FIVE	SIX	SEVEN	EIGHT
Chi-Square	4.263	1.477	.615	4.497	2.207	3.487	3.618	3.334
df	4	4	4	4	4	4	4	4
Asymp. Sig.	.372	.831	.961	.343	.698	.480	.460	.504

a. Kruskal Wallis Test

b. Grouping Variable: award

c. status = employer

NPar Tests

status = graduate

Kruskal-Wallis Test

Ranks^a

	level of award	N	Mean Rank
ONE	First class	7	32.57
	upper second	49	47.06
	lower second	34	57.04
	third class	3	37.17
	non honours	1	82.00
	pass diploma	5	56.60
	Total	99	
TWO	First class	7	36.93
	upper second	50	49.82
	lower second	35	55.16
	third class	3	25.00
	non honours	1	85.50
	pass diploma	5	62.10
	Total	101	

- Kruskal- Wallis ANOVA on-level of award and un-weighted sub-scale scores

	level of award	N	Mean Rank
THREE	First class	7	48.79
	upper second	50	48.04
	lower second	35	54.00
	third class	3	23.17
	non honours	1	84.50
	pass diploma	5	72.70
	Total	101	
FOUR	First class	7	38.93
	upper second	49	49.35
	lower second	35	54.53
	third class	3	35.50
	non honours	1	70.50
	pass diploma	5	54.80
	Total	100	
FIVE	First class	7	45.29
	upper second	50	50.30
	lower second	35	55.04
	third class	3	29.33
	non honours	1	50.00
	pass diploma	5	50.90
	Total	101	
SIX	First class	7	37.29
	upper second	50	48.85
	lower second	35	57.17
	third class	3	35.17
	non honours	1	57.50
	pass diploma	5	56.70
	Total	101	

	level of award	N	Mean Rank
SEVEN	First class	7	38.57
	upper second	49	42.23
	lower second	34	63.26
	third class	3	35.83
	non honours	1	77.00
	pass diploma	5	55.00
	Total	99	
EIGHT	First class	7	49.14
	upper second	50	51.26
	lower second	35	51.66
	third class	3	16.50
	non honours	1	69.00
	pass diploma	5	63.50
	Total	101	

a. status = graduate

Test Statistics^{a,b,c}

	ONE	TWO	THREE	FOUR	FIVE	SIX	SEVEN	EIGHT
Chi-Square	7.387	6.954	7.909	3.317	2.764	4.733	13.989	5.965
df	5	5	5	5	5	5	5	5
Asymp. Sig.	.193	.224	.161	.651	.736	.449	.016	.310

a. Kruskal Wallis Test

b. Grouping Variable: level of award

c. status = graduate

status = employer

Kruskal-Wallis Test

level of award	N	Mean Rank
ONE		
First class	5	17.30
upper second	36	35.56
lower second	24	39.85
third class	3	55.17
non honours	1	7.00
pass diploma	2	30.25
Total	71	
TWO		
First class	5	17.70
upper second	36	33.24
lower second	24	43.23
third class	3	52.50
non honours	1	17.00
pass diploma	2	29.50
Total	71	
THREE		
First class	5	22.70
upper second	36	30.99
lower second	25	45.60
third class	3	57.67
non honours	1	7.50
pass diploma	2	39.25
Total	72	
FOUR		
First class	5	22.50
upper second	36	30.46
lower second	22	44.55
third class	3	51.67
non honours	1	5.00
pass diploma	2	33.00
Total	69	

level of award	N	Mean Rank
FIVE		
First class	5	20.40
upper second	36	33.11
lower second	23	40.72
third class	3	51.33
non honours	1	14.50
pass diploma	2	43.00
Total	70	
SIX		
First class	4	16.50
upper second	36	31.56
lower second	23	41.59
third class	3	55.33
non honours	1	13.50
pass diploma	2	38.50
Total	69	
SEVEN		
First class	5	26.20
upper second	35	30.44
lower second	23	42.39
third class	3	58.83
non honours	1	12.00
pass diploma	2	27.50
Total	69	
EIGHT		
First class	5	26.70
upper second	35	31.04
lower second	25	43.86
third class	3	48.50
non honours	1	3.50
pass diploma	2	45.25
Total	71	

a. status = employer

	ONE	TWO	THREE	FOUR	FIVE	SIX	SEVEN	EIGHT
Chi-Square	9.833	10.621	15.469	13.487	8.549	13.126	11.912	11.322
df	5	5	5	5	5	5	5	5
Asymp. Sig.	.080	.059	.009	.019	.128	.022	.036	.045

a. Kruskal Wallis Test

b. Grouping Variable: level of award

c. status = employer

- Kruskal- Wallis ANOVA on year of qualification and un-weighted sub-scale scores

Ranks^a

Year of qualification		N	Mean Rank
ONE	1999	77	49.07
	1998	19	48.79
	1997	3	81.50
	Total	99	
TWO	1999	78	52.85
	1998	20	45.55
	1997	3	39.17
	Total	101	
THREE	1999	78	52.78
	1998	20	39.45
	1997	3	81.83
	Total	101	
FOUR	1999	77	50.86
	1998	20	45.38
	1997	3	75.50
	Total	100	
FIVE	1999	78	53.67
	1998	20	39.38
	1997	3	59.00
	Total	101	
SIX	1999	78	51.85
	1998	20	45.45
	1997	3	66.00
	Total	101	
SEVEN	1999	77	49.19
	1998	19	51.53
	1997	3	61.00
	Total	99	
EIGHT	1999	78	51.72
	1998	20	43.00
	1997	3	85.67
	Total	101	

a. status = graduate

	ONE	TWO	THREE	FOUR	FIVE	SIX	SEVEN	EIGHT
Chi-Square	3.798	1.512	6.922	2.920	4.270	1.661	.566	6.227
df	2	2	2	2	2	2	2	2
Asymp. Sig.	.150	.470	.031	.232	.118	.436	.754	.044

a. Kruskal Wallis Test

b. Grouping Variable: Year of qualification

c. status = graduate

status = employer

Kruskal-Wallis Test

Year of qualification		N	Mean Rank
ONE	1999	65	40.47
	1998	19	50.82
	1997	2	72.50
	Total	86	
TWO	1999	66	42.07
	1998	19	47.47
	1997	2	74.75
	Total	87	
THREE	1999	67	42.31
	1998	19	48.34
	1997	2	81.50
	Total	88	
FOUR	1999	64	41.27
	1998	19	46.89
	1997	2	61.50
	Total	85	
FIVE	1999	65	41.11
	1998	19	51.39
	1997	2	46.25
	Total	86	
SIX	1999	64	40.19
	1998	19	50.47
	1997	2	62.00
	Total	85	
SEVEN	1999	64	41.10
	1998	19	46.55
	1997	2	70.00
	Total	85	
EIGHT	1999	66	41.64
	1998	19	52.45
	1997	2	41.50
	Total	87	

	ONE	TWO	THREE	FOUR	FIVE	SIX	SEVEN	EIGHT
Chi-Square	5.405	3.788	5.495	1.993	2.731	4.330	3.233	2.958
df	2	2	2	2	2	2	2	2
Asymp. Sig.	.067	.151	.064	.369	.255	.115	.199	.228

a. Kruskal Wallis Test

b. Grouping Variable: Year of qualification

c. status = employer

- MANOVA on Age, level of award and weighted Bartlett factor sub-scale scores

Between-Subjects Factors^a

	Value Label	N
level of award	1 First class	5
	2 upper second	31
	3 lower second	23
	4 third class	3
	6 pass diploma	4
	1 under 21	25
age category	2 over 21	39
	9 missing data	2

a. status = graduate

Descriptive Statistics^a

	level of award	age category	Mean	Std. Deviation	N
BART factor score 1 for analysis 1	First class	under 21	.3461316	.	1
		over 21	-.7710984	.3680488	4
		Total	-.5476524	.5926513	5
	upper second	under 21	.2218426	1.2100383	11
		over 21	-.2681784	.7475429	19
		missing data	.9122251	.	1
	Total	-5.62E-02	.9546847	31	
	lower second	under 21	-.1705855	1.0813905	11
		over 21	.1355845	.9220525	12
		Total	-1.08E-02	.9905010	23
	third class	under 21	.4417369	2.1730001	2
		over 21	-.9604758	.	1
		Total	-2.57E-02	1.7367685	3
	pass diploma	over 21	-6.51E-02	.4887966	3
		missing data	-.1355981	.	1
Total		-8.27E-02	.4006543	4	

	level of award	age category	Mean	Std. Deviation	N
BART factor score 1 for analysis 1	Total		7.17E-02	1.1601144	25
		under 21			
		over 21	-.1976551	.7892705	39
		missing data	.3883135	.7409229	2
		Total	-7.79E-02	.9452355	66
BART factor score 2 for analysis 1	First class		-1.506146	.	1
		under 21			
		over 21	-.5944270	.7446031	4
		Total	-.7767709	.7629363	5
	upper second				
		under 21	-.5980485	1.3738188	11
		over 21	-.1404460	1.0920736	19
		missing data	.7249859	.	1
		Total	-.2749039	1.1948912	31
	lower second				
		under 21	-.1487952	.7338130	11
		over 21	-.1620339	.7524670	12
		Total	-.1557023	.7265765	23
	third class				
		under 21	-1.275333	1.1284074	2
		over 21	-.5993896	.	1
		Total	-1.050019	.8882294	3
	pass diploma				
		over 21	.3725590	.5116284	3
		missing data	-.6975767	.	1
		Total	.1050251	.6788274	4
	Total				
		under 21	-.4908837	1.1031579	25
		over 21	-.1659564	.9131655	39
		missing data	1.37E-02	1.0059037	2
		Total	-.2835907	.9899233	66
BART factor score 3 for analysis 1	First class		-.8731711	.	1
		under 21			
		over 21	-.1614198	1.0597187	4
		Total	-.3037701	.9713757	5
	upper second				
		under 21	-9.02E-02	1.3204917	11
		over 21	-.3106614	.9070768	19
		missing data	.9060673	.	1
		Total	-.1931879	1.0619853	31
	lower second				
		under 21	-.4209631	1.0746795	11
		over 21	-.2020294	1.2454115	12
		Total	-.3067368	1.1458620	23

	level of award	age category	Mean	Std. Deviation	N
BART factor score 3 for analysis 1	third class	under 21	-1.510954	8.846545E-03	2
		over 21	-.5876418	.	1
		Total	-1.203183	.5331112	3
	pass diploma	over 21	.6156457	.3626551	3
		missing data	1.1681922	.	1
		Total	.7537823	.4049766	4
	Total	under 21	-.3807199	1.1677962	25
		over 21	-.1977770	.9985301	39
		missing data	1.0371297	.1853502	2
		Total	-.2296521	1.0703868	66
BART factor score 4 for analysis 1	First class	under 21	.6168099	.	1
		over 21	-.2504990	.8510035	4
		Total	-7.70E-02	.8328266	5
	upper second	under 21	3.35E-02	1.2729037	11
		over 21	.1110568	.7641199	19
		missing data	.1783507	.	1
		Total	8.57E-02	.9445192	31
	lower second	under 21	-.2769928	1.3456848	11
		over 21	2.72E-02	1.2994404	12
		Total	-.1182974	1.3005880	23
BART factor score 5 for analysis 1	third class	under 21	.3740669	.3137498	2
		over 21	-1.448850	.	1
		Total	-.2335721	1.0755905	3
	pass diploma	over 21	-.2226298	.1692328	3
		missing data	.6098008	.	1
		Total	-1.45E-02	.4385526	4
	Total	under 21	-5.26E-02	1.2223181	25
		over 21	-1.75E-02	.9465149	39
		missing data	.3940757	.3050813	2
		Total	-1.83E-02	1.0404427	66
BART factor score 5 for analysis 1	First class	under 21	.8531750	.	1
		over 21	-.5516159	.5382474	4
		Total	-.2706577	.7822852	5

	level of award	age category	Mean	Std. Deviation	N
BART factor score 5 for analysis 1	upper second	under 21	.1442237	1.1528417	11
		over 21	.3919921	1.4352038	19
		missing data	-.4866392	.	1
		Total	.2757313	1.3088835	31
	lower second	under 21	.2879683	.8451927	11
		over 21	-6.41E-02	1.1138806	12
		Total	.1042644	.9886409	23
	third class	under 21	-5.58E-02	.1678715	2
		over 21	8.64E-02	.	1
		Total	-8.40E-03	.1443354	3
	pass diploma	over 21	-.3963986	.4940420	3
		missing data	1.3063518	.	1
		Total	2.93E-02	.9421030	4
Total	under 21	.2198268	.9382865	25	
	over 21	8.64E-02	1.2188831	39	
	missing data	.4098563	1.2678361	2	
	Total	.1467336	1.1066674	66	
BART factor score 6 for analysis 1	First class	under 21	-.3415037	.	1
		over 21	-.3548443	.6346157	4
		Total	-.3521762	.5496257	5
	upper second	under 21	.2333123	1.3898922	11
		over 21	-1.95E-02	1.0329243	19
		missing data	-.5828155	.	1
		Total	5.20E-02	1.1457826	31
	lower second	under 21	.3349649	1.3538867	11
		over 21	.2452895	.7691150	12
		Total	.2881777	1.0635097	23
	third class	under 21	.2076397	.2895506	2
		over 21	-2.11E-02	.	1
		Total	.1313810	.2436512	3
pass diploma	over 21	.2899299	.8013632	3	
	missing data	.5642492	.	1	
	Total	.3585097	.6685318	4	

	level of award	age category	Mean	Std. Deviation	N
BART factor score 6 for analysis 1	Total	under 21	.2529930	1.2610784	25
		over 21	5.13E-02	.8823861	39
		missing data	-9.28E-03	.8110972	2
		Total	.1258862	1.0308302	66
BART factor score 7 for analysis 1	First class	under 21	-9.77E-02	.	1
		over 21	-.1819210	1.0378895	4
		Total	-.1650759	.8996275	5
	upper second	under 21	-.7865569	1.2926794	11
		over 21	-.2221265	1.1946160	19
		missing data	.3658407	.	1
		Total	-.4034416	1.2278587	31
	lower second	under 21	.7852006	.6567867	11
		over 21	-9.73E-02	1.0827812	12
		Total	.3247713	.9926964	23
	third class	under 21	.6735364	.7908101	2
		over 21	-1.359189	.	1
	Total	-4.04E-03	1.3000057	3	
pass diploma	over 21	.2463275	.3529483	3	
	missing data	-.5690273	.	1	
	Total	4.25E-02	.4992486	4	
	Total	4.94E-02	1.2263171	25	
BART factor score 8 for analysis 1	First class	under 21	-.1727118	1.0774580	39
		over 21	-.1015933	.6610515	2
		Total	-8.64E-02	1.1190392	66
	upper second	under 21	-.4447443	.	1
		over 21	-4.75E-02	1.0740512	4
		Total	-.1269671	.9469670	5
	lower second	under 21	-.1658757	1.6596755	11
		over 21	-.4938572	.9651566	19
		missing data	-5.16E-02	.	1
		Total	-.3632105	1.2269538	31
	Total	under 21	-.1741104	.7447302	11
		over 21	-.1349111	.6191101	12
Total		-.1536586	.6664465	23	

	level of award	age category	Mean	Std. Deviation	N
BART factor score 8 for analysis 1	third class	under 21	-.8165005	.2785735	2
		over 21	-.1467387	.	1
		Total	-.5932466	.4339684	3
pass diploma	over 21		.3287944	1.3527768	3
	missing data		.2313244	.	1
	Total		.3044269	1.1056122	4
Total	under 21		-.2327037	1.1899326	25
	over 21		-.2654530	.8968319	39
	missing data		8.99E-02	.2000613	2
	Total		-.2422809	.9986924	66

a. status = graduate

Multivariate Tests^{c,d}

Effect	Value	F	Hypothesis df	Error df	Sig.	Eta Squared
Intercept	Pillai's Trace	.341 ^a	8.000	52.000	.946	.050
	Wilks' Lambda	.341 ^a	8.000	52.000	.946	.050
	Hotelling's Trace	.341 ^a	8.000	52.000	.946	.050
	Roy's Largest Root	.341 ^a	8.000	52.000	.946	.050
LEVEL	Pillai's Trace	.428	32.000	220.000	.739	.107
	Wilks' Lambda	.622	32.000	193.362	.726	.112
	Hotelling's Trace	.533	32.000	202.000	.714	.117
	Roy's Largest Root	.345	2.369 ^b	8.000	55.000	.029
AGE	Pillai's Trace	.099	16.000	106.000	.991	.050
	Wilks' Lambda	.903	16.000	104.000	.991	.050
	Hotelling's Trace	.105	16.000	102.000	.992	.050
	Roy's Largest Root	.056	8.000	53.000	.932	.053

a. Exact statistic

b. The statistic is an upper bound on F that yields a lower bound on the significance level.

c. Design: Intercept+LEVEL+AGE

d. status = graduate

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	BART factor score 1 for analysis 1	2.492 ^a	6	.415	.441	.849	.043
	BART factor score 2 for analysis 1	5.482 ^b	6	.914	.926	.483	.086
	BART factor score 3 for analysis 1	8.321 ^c	6	1.387	1.237	.301	.112
	BART factor score 4 for analysis 1	1.026 ^d	6	.171	.145	.989	.015
	BART factor score 5 for analysis 1	1.915 ^e	6	.319	.242	.960	.024
	BART factor score 6 for analysis 1	2.710 ^f	6	.452	.402	.875	.039
	BART factor score 7 for analysis 1	7.510 ^g	6	1.252	1.000	.434	.092
	BART factor score 8 for analysis 1	2.405 ^h	6	.401	.379	.890	.037
Intercept	BART factor score 1 for analysis 1	2.750E-03	1	2.750E-03	.003	.957	.000
	BART factor score 2 for analysis 1	2.176	1	2.176	2.206	.143	.036
	BART factor score 3 for analysis 1	1.307E-03	1	1.307E-03	.001	.973	.000
	BART factor score 4 for analysis 1	2.345E-02	1	2.345E-02	.020	.888	.000
	BART factor score 5 for analysis 1	.167	1	.167	.127	.723	.002
	BART factor score 6 for analysis 1	1.601E-02	1	1.601E-02	.014	.905	.000
	BART factor score 7 for analysis 1	6.980E-04	1	6.980E-04	.001	.981	.000
	BART factor score 8 for analysis 1	.261	1	.261	.247	.621	.004

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
LEVEL	BART factor score 1 for analysis 1	.938	4	.235	.249	.909	.017
	BART factor score 2 for analysis 1	3.692	4	.923	.935	.450	.060
	BART factor score 3 for analysis 1	4.501	4	1.125	1.004	.413	.064
	BART factor score 4 for analysis 1	.656	4	.164	.140	.967	.009
	BART factor score 5 for analysis 1	1.501	4	.375	.285	.887	.019
	BART factor score 6 for analysis 1	2.053	4	.513	.456	.767	.030
	BART factor score 7 for analysis 1	6.758	4	1.690	1.349	.263	.084
	BART factor score 8 for analysis 1	2.161	4	.540	.511	.728	.033
AGE	BART factor score 1 for analysis 1	1.262	2	.631	.670	.516	.022
	BART factor score 2 for analysis 1	1.521	2	.761	.771	.467	.025
	BART factor score 3 for analysis 1	1.404	2	.702	.626	.538	.021
	BART factor score 4 for analysis 1	.304	2	.152	.129	.879	.004
	BART factor score 5 for analysis 1	.360	2	.180	.137	.873	.005
	BART factor score 6 for analysis 1	.576	2	.288	.256	.775	.009
	BART factor score 7 for analysis 1	.388	2	.194	.155	.857	.005
	BART factor score 8 for analysis 1	.140	2	6.978E-02	.066	.936	.002

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Error	BART factor score 1 for analysis 1	55.584	59	.942			
	BART factor score 2 for analysis 1	58.214	59	.987			
	BART factor score 3 for analysis 1	66.152	59	1.121			
	BART factor score 4 for analysis 1	69.338	59	1.175			
	BART factor score 5 for analysis 1	77.691	59	1.317			
	BART factor score 6 for analysis 1	66.359	59	1.125			
	BART factor score 7 for analysis 1	73.886	59	1.252			
	BART factor score 8 for analysis 1	62.425	59	1.058			
Total	BART factor score 1 for analysis 1	58.476	66				
	BART factor score 2 for analysis 1	69.005	66				
	BART factor score 3 for analysis 1	77.953	66				
	BART factor score 4 for analysis 1	70.386	66				
	BART factor score 5 for analysis 1	81.027	66				
	BART factor score 6 for analysis 1	70.116	66				
	BART factor score 7 for analysis 1	81.889	66				
	BART factor score 8 for analysis 1	68.704	66				

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Total	BART factor score	58.076	65				
	1 for analysis 1	63.697	65				
	BART factor score	74.472	65				
	2 for analysis 1	70.364	65				
	BART factor score	79.606	65				
	3 for analysis 1	69.070	65				
	BART factor score	81.396	65				
	4 for analysis 1	64.830	65				
	BART factor score						
	5 for analysis 1						
	BART factor score						
	6 for analysis 1						
	BART factor score						
	7 for analysis 1						
	BART factor score						
	8 for analysis 1						

- a. R Squared = .043 (Adjusted R Squared = -.054)
- b. R Squared = .086 (Adjusted R Squared = -.007)
- c. R Squared = .112 (Adjusted R Squared = .021)
- d. R Squared = .015 (Adjusted R Squared = -.086)
- e. R Squared = .024 (Adjusted R Squared = -.075)
- f. R Squared = .039 (Adjusted R Squared = -.058)
- g. R Squared = .092 (Adjusted R Squared = .000)
- h. R Squared = .037 (Adjusted R Squared = -.061)
- i. status = graduate

status = employer

Between-Subjects Factors^a

	Value Label	N
level of award	1 First class	4
	2 upper second	23
	3 lower second	11
	4 third class	2
	5 non honours	1
age category	1 under 21	16
	2 over 21	25

a. status = employer

Descriptive Statistics^a

	level of award	age category	Mean	Std. Deviation	N
BART factor score 1 for analysis 1	First class	under 21	-.6343870	.	1
		over 21	-.3412709	.8069711	3
		Total	-.4145499	.6749920	4
	upper second	under 21	-.922E-02	.8224176	8
		over 21	.1475879	1.3025543	15
		Total	6.42E-02	1.1439105	23
	lower second	under 21	3.02E-02	.3824626	5
		over 21	.3572371	1.3963779	6
		Total	.2085962	1.0308302	11
	third class	under 21	.4207907	1.4638326	2
		Total	.4207907	1.4638326	2
non honours	over 21	-1.136299	.	1	
	Total	-1.136299	.	1	
Total	under 21	-2.37E-02	.7430875	16	
	over 21	8.79E-02	1.2474098	25	
	Total	4.43E-02	1.0694500	41	
BART factor score 2 for analysis 1	First class	under 21	-7.26E-02	.	1
		over 21	-.5450780	1.1129292	3
		Total	-.4269591	.9389085	4

Descriptive Statistics*

	level of award	age category	Mean	Std. Deviation	N
BART factor score 2 for analysis 1	upper second	under 21	.4813670	.7250642	8
		over 21	.2957692	.7539075	15
		Total	.3603249	.7328965	23
	lower second	under 21	.1570006	.6338336	5
		over 21	1.1271507	.9060686	6
		Total	.6861734	.9098718	11
	third class	under 21	.2609536	.4238185	2
		Total	.2609536	.4238185	2
	non honours	over 21	.3298832	.	1
		Total	.3298832	.	1
BART factor score 3 for analysis 1	Total	under 21	.3178277	.6308102	16
		over 21	.3957636	.9255343	25
		Total	.3653496	.8152731	41
	First class	under 21	-1.269219	.	1
		over 21	.3842487	.6912793	3
		Total	-2.91E-02	1.0010331	4
	upper second	under 21	-.2693689	.5717146	8
		over 21	-2.40E-02	.8270234	15
		Total	-.1093368	.7439973	23
	lower second	under 21	.1774596	.5100643	5
	over 21	.8249260	.3945532	6	
	Total	.5306231	.5442730	11	
third class	under 21	.4288407	1.2326195	2	
	Total	.4288407	1.2326195	2	
non honours	over 21	-1.175208	.	1	
	Total	-1.175208	.	1	
Total	under 21	-.1049495	.7018285	16	
	over 21	.1826920	.8264114	25	
	Total	7.04E-02	.7840055	41	
BART factor score 4 for analysis 1	First class	under 21	.4673168	.	1
		over 21	-.3151496	1.0968212	3
		Total	-.1195330	.9772792	4

	level of award	age category	Mean	Std. Deviation	N
BART factor score 4 for analysis 1	upper second	under 21	-.3717962	1.1752644	8
		over 21	-8.04E-02	.8270754	15
		Total	-.1817542	.9460083	23
	lower second	under 21	.4912214	.9999894	5
		over 21	.5084954	1.5342789	6
		Total	.5006436	1.2558180	11
	third class	under 21	-.5650148	.2152834	2
		Total	-.5650148	.2152834	2
	non honours	over 21	-.3570399	.	1
		Total	-.3570399	.	1
Total	under 21	-7.38E-02	1.0582073	16	
	over 21	2.17E-02	1.0371208	25	
	Total	-1.56E-02	1.0332099	41	
BART factor score 5 for analysis 1	First class	under 21	-1.232328	.	1
		over 21	.4316876	1.8407331	3
		Total	1.57E-02	1.7178773	4
	upper second	under 21	-.5838069	.7012814	8
		over 21	-.1675114	.6698718	15
		Total	-.3123098	.6950784	23
	lower second	under 21	6.15E-02	.5006676	5
		over 21	.2967297	.7443545	6
		Total	.1897937	.6264133	11
	third class	under 21	1.0451014	2.1413242	2
Total		1.0451014	2.1413242	2	
non honours	over 21	-.3148010	.	1	
	Total	-.3148010	.	1	
Total	under 21	-.2190767	.9903279	16	
	over 21	9.92E-03	.8523009	25	
	Total	-7.94E-02	.9035602	41	
BART factor score 6 for analysis 1	First class	under 21	.4205485	.	1
		over 21	-1.817853	1.8663137	3
	Total	under 21	-1.258252	1.8906862	4

Descriptive Statistics*

	level of award	age category	Mean	Std. Deviation	N
BART factor score 6 for analysis 1	upper second	under 21	-.7483792	1.0997717	8
		over 21	-.3803369	.6586682	15
		Total	-.5083516	.8324941	23
	lower second	under 21	-.2721640	.8257968	5
		over 21	-.1009985	1.0977635	6
		Total	-.1788010	.9398450	11
	third class	under 21	-.4147458	9.727698E-02	2
		Total	-.4147458	9.727698E-02	2
	non honours	over 21	.2355292	.	1
		Total	.2355292	.	1
BART factor score 7 for analysis 1	Total	under 21	-.4847998	.9243031	16
		over 21	-.4611629	1.0398115	25
		Total	-.4703871	.9844984	41
	First class	under 21	.2821094	.	1
		over 21	.3859845	.8664362	3
		Total	.3600157	.7093461	4
	upper second	under 21	-.1998650	.9324027	8
		over 21	.1903274	.8961315	15
		Total	5.46E-02	.9076116	23
	lower second	under 21	-3.87E-02	.9937650	5
	over 21	-2.46E-02	1.0645286	6	
	Total	-3.10E-02	.9806590	11	
third class	under 21	1.1893894	.3705447	2	
	Total	1.1893894	.3705447	2	
non honours	over 21	-4.51E-02	.	1	
	Total	-4.51E-02	.	1	
Total	under 21	5.43E-02	.9438218	16	
	over 21	.1527987	.8855921	25	
	Total	.1143527	.8983213	41	
BART factor score 8 for analysis 1	First class	under 21	-.5824881	.	1
		over 21	.5376661	2.3067144	3
		Total	.2576275	1.9649361	4
		Total			

	level of award	age category	Mean	Std. Deviation	N
BART factor score 8 for analysis 1	upper second	under 21	.2590100	.7860861	8
		over 21	.1840026	1.0280383	15
		Total	.2100921	.9330047	23
lower second		under 21	.6280877	.7866509	5
		over 21	.1633438	.8367466	6
		Total	.3745910	.8102505	11
third class		under 21	6.09E-02	.5741282	2
		Total	6.09E-02	.5741282	2
non honours		over 21	-1.758837	.	1
		Total	-1.758837	.	1
Total		under 21	.2969841	.7560903	16
		over 21	.1437705	1.1735029	25
		Total	.2035612	1.0229214	41

a. status = employer

Multivariate Tests^{c,d}

Effect	Value	F	Hypothesis df	Error df	Sig.	Eta Squared
Intercept	Pillai's Trace	.222	8.000	28.000	.457	.222
	Wilks' Lambda	.778	8.000	28.000	.457	.222
	Hotelling's Trace	.286	8.000	28.000	.457	.222
	Roy's Largest Root	.286	8.000	28.000	.457	.222
LEVEL	Pillai's Trace	1.015	32.000	124.000	.144	.254
	Wilks' Lambda	.287	32.000	104.854	.149	.268
	Hotelling's Trace	1.573	32.000	106.000	.160	.282
	Roy's Largest Root	.775	3.004 ^b	8.000	31.000	.013
AGE	Pillai's Trace	.241	8.000	28.000	.386	.241
	Wilks' Lambda	.759	8.000	28.000	.386	.241
	Hotelling's Trace	.317	8.000	28.000	.386	.241
	Roy's Largest Root	.317	8.000	28.000	.386	.241

a. Exact statistic

b. The statistic is an upper bound on F that yields a lower bound on the significance level.

c. Design: Intercept+LEVEL+AGE

d. status = employer

Tests of Between-Subjects Effects'

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	BART factor score 1	3.468 ^a	5	.694	.574	.719	.076
	BART factor score 2 for analysis 1	3.868 ^b	5	.774	1.192	.333	.145
	BART factor score 3 for analysis 1	7.034 ^c	5	1.407	2.805	.031	.286
	BART factor score 4 for analysis 1	4.441 ^d	5	.888	.812	.549	.104
	BART factor score 5 for analysis 1	6.563 ^e	5	1.313	1.761	.147	.201
	BART factor score 6 for analysis 1	4.014 ^f	5	.803	.808	.552	.104
	BART factor score 7 for analysis 1	3.425 ^g	5	.685	.831	.536	.106
	BART factor score 8 for analysis 1	4.303 ^h	5	.861	.802	.556	.103
Intercept	BART factor score 1 for analysis 1	.502	1	.502	.416	.523	.012
	BART factor score 2 for analysis 1	.684	1	.684	1.054	.312	.029
	BART factor score 3 for analysis 1	.173	1	.173	.345	.560	.010
	BART factor score 4 for analysis 1	.313	1	.313	.287	.596	.008
	BART factor score 5 for analysis 1	9.001E-02	1	9.001E-02	.121	.730	.003
	BART factor score 6 for analysis 1	2.448	1	2.448	2.466	.125	.066
	BART factor score 7 for analysis 1	1.053	1	1.053	1.277	.266	.035
	BART factor score 8 for analysis 1	.347	1	.347	.323	.573	.009

Tests of Between-Subjects Effects'

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
LEVEL	BART factor score 1 for analysis 1	3.346	4	.837	.692	.602	.073
	BART factor score 2 for analysis 1	3.809	4	.952	1.467	.233	.144
	BART factor score 3 for analysis 1	6.227	4	1.557	3.104	.027	.262
	BART factor score 4 for analysis 1	4.352	4	1.088	.995	.423	.102
	BART factor score 5 for analysis 1	6.051	4	1.513	2.029	.112	.188
	BART factor score 6 for analysis 1	4.008	4	1.002	1.009	.416	.103
	BART factor score 7 for analysis 1	3.331	4	.833	1.010	.416	.103
	BART factor score 8 for analysis 1	4.074	4	1.019	.949	.447	.098
AGE	BART factor score 1 for analysis 1	.642	1	.642	.532	.471	.015
	BART factor score 2 for analysis 1	.201	1	.201	.310	.581	.009
	BART factor score 3 for analysis 1	2.113	1	2.113	4.213	.048	.107
	BART factor score 4 for analysis 1	.111	1	.111	.101	.752	.003
	BART factor score 5 for analysis 1	1.897	1	1.897	2.545	.120	.068
	BART factor score 6 for analysis 1	5.769E-02	1	5.769E-02	.058	.811	.002
	BART factor score 7 for analysis 1	.533	1	.533	.646	.427	.018
	BART factor score 8 for analysis 1	7.709E-02	1	7.709E-02	.072	.790	.002

Tests of Between-Subjects Effects'

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Error	BART factor score 1 for analysis 1	42.281	35	1.208			
	BART factor score 2 for analysis 1	22.719	35	.649			
	BART factor score 3 for analysis 1	17.553	35	.502			
	BART factor score 4 for analysis 1	38.260	35	1.093			
	BART factor score 5 for analysis 1	26.094	35	.746			
	BART factor score 6 for analysis 1	34.756	35	.993			
	BART factor score 7 for analysis 1	28.854	35	.824			
	BART factor score 8 for analysis 1	37.551	35	1.073			
Total	BART factor score 1 for analysis 1	45.830	41				
	BART factor score 2 for analysis 1	32.060	41				
	BART factor score 3 for analysis 1	24.790	41				
	BART factor score 4 for analysis 1	42.711	41				
	BART factor score 5 for analysis 1	32.916	41				
	BART factor score 6 for analysis 1	47.841	41				
	BART factor score 7 for analysis 1	32.815	41				
	BART factor score 8 for analysis 1	43.554	41				

Tests of Between-Subjects Effects'

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Total		45.749	40				
	BART factor score 1	26.587	40				
	BART factor score 2 for analysis 1	24.587	40				
	BART factor score 3 for analysis 1	42.701	40				
	BART factor score 4 for analysis 1	32.657	40				
	BART factor score 5 for analysis 1	38.769	40				
	BART factor score 6 for analysis 1	32.279	40				
	BART factor score 7 for analysis 1	41.855	40				
	BART factor score 8 for analysis 1						

- a. R Squared = .076 (Adjusted R Squared = -.056)
- b. R Squared = .145 (Adjusted R Squared = .023)
- c. R Squared = .286 (Adjusted R Squared = .184)
- d. R Squared = .104 (Adjusted R Squared = -.024)
- e. R Squared = .201 (Adjusted R Squared = .087)
- f. R Squared = .104 (Adjusted R Squared = -.025)
- g. R Squared = .106 (Adjusted R Squared = -.022)
- h. R Squared = .103 (Adjusted R Squared = -.025)
- i. status = employer