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Some Evidence of the Development of L2 Reading-into-Writing Skills at Three Levels

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Abstract

While an integrated format has been widely incorporated into high-stakes writing assessment, there is relatively little research on students' cognitive processing involved in integrated reading-into-writing tasks. Even research which reviews how the reading-into-writing construct is distinct from one level to the other is scarce. Using a writing process questionnaire, we examined and compared test takers' cognitive processes on integrated reading-into-writing tasks at three levels. More specifically, the study aims to provide evidence of the predominant reading-into-writing processes appropriate at each level (i.e., the CEFR B1, B2, and C1 levels). The findings of the study reveal the core processes which are essential to the reading-into-writing construct at all three levels. There is also a clear progression of the reading-into-writing skills employed by the test takers across the three CEFR levels. A multiple regression analysis was used to examine the impact of the individual processes on predicting the writers' level of reading-into-writing abilities. The findings provide empirical evidence concerning the cognitive validity of reading-into-writing tests and have important implications for task design and scoring at each level.

Keywords: reading-into-writing, integrated tasks, cognitive processing, L2 writers, cognitive validity

Introduction

Integrated reading-into-writing tasks, in which writers need to synthesise reading materials as they do in most real-life writing, play an increasingly important role in high-stakes language tests (Cho, Rijmen, & Novak, 2013). Weir, Vidakovic, and Galaczi (2013) conducted a comprehensive review of the use of the intergrated task type in large-scale language tests and found that the use of integrated tasks in standardised language tests can be traced back as far as the early 1930s. The integrated task type was also popular during the eighties when the communicative approach to teaching and learning was emphasised. However, the integrated task type fell out of favour in the decades that followed when there was a great need to measure students' English proficiency in terms of four independent language

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skills. Since then, almost all high-stakes language tests have structured their assessment in four separate skill papers, namely reading, writing, listening, and speaking.

This approach to assessing students' language skills, however, has raised concerns about the extent to which the integrated nature of writing skills is assessed under the test conditions (Weigle, 2002; Weir *et al.*, 2013). For example, in the case of academic writing, research to date has shown that summarisation skills are essential for content acquisition and academic success (MacLellan, 1997; Friend, 2002). Therefore, students' abilities to summarise or integrate ideas from different sources would appear to be a critical focus for assessing a student's academic literacy.

With an increased awareness of the importance of representing what students would normally do in real-life language tasks in test conditions, language test providers worldwide are once again seeking to incorporate integrated tasks into their assessment (Yu, 2013). While it is evident that the integrated task type is in demand again, the repeated rise and demise of the integrated task type in the last century has resulted in a lack of coherent understanding of the complex and multifaceted cognitive processes involved in integrated performance (Belcher & Hirvela, 2001). Evidence of how reading-into-writing processes may differ across proficiency levels is even scarcer. The study investigated test takers' processes at three levels within a suite of reading-into-writing tasks, corresponding to three Common European Framework of Reference (CEFR) for Languages from B1 (Independent User—Threshold), B2 (Independent User—Vantage) to C1 (Proficient User—Effective) (for more details, see Council of Europe, 2001).

To put the research in context, we will review literature regarding three areas of interest relevant to the present study: lack of models of reading-into-writing in language testing, development of L2 reading-into-writing skills, and processes elicited by integrated tasks.

Lack of a Comprehensive Model of Reading-into-Writing for Language Testing

Reading-into-writing or writing from sources is a unique construct which requires more than mere reading comprehension and writing-only (or writing from memory) skills (Ascención Delaney, 2008; Gebril & Plakans, 2013; Chan, Inoue, & Taylor, 2015; Chan, 2018). While there is a comparatively rich literature on the cognitive processing involved in reading comprehension and those involved in writing, comprehensive models of integrated reading-into-writing are missing (Hirvela, 2001; Yu, 2013).

The literature reveals that writing is not a linear stand-alone process but involves multiple recursions of processes such as *planning*, *translating*, and *reviewing* (Hayes & Flower, 1980; Hayes, 1996; Grabe & Kaplan, 1996). Weir (2005) argues that test providers should provide evidence showing how these target cognitive processes are operationalised in their tests. For the first time in the language testing literature, Shaw and Weir (2007) examined the cognitive demands of a suite of writing tests, specifically Cambridge Examinations KET, PET, FCE, CAE, and CPE (each targeting a different CEFR level). Based on an analysis of the sample tasks and documentations supplied by the test provider, Shaw and Weir (2007) specified the cognitive demands of each test in terms of five writing processes, including *macro-planning*, *organisation*, *micro-planning*, *translating*, and *monitoring*. Since then, Weir's (2005) socio-cognitive approach to test development and validation has been applied widely by other major writing tests, such as IELTS (Bridges, 2010; Weir *et al.*, 2013), LTTC's General English Proficiency Test in Taiwan (Chan, Wu, & Weir, 2014), Trinity College London's Integrated Skills of English (Chan *et al.*, 2015) and British Council's Aptis (O'Sullivan, 2015). Shaw and Weir's (2007) writing model is widely used in language testing. However, there are two limitations. As acknowledged by the researchers, their document analysis approach is limited to a rather subjective

surface-level exploration which relies heavily on the perspective of the test provider and the expertise of the research team. Moreover, their model has almost no mention of the processes of writing from sources, and hence has limited relevance to the development and validation of integrated reading-into-writing tests.

On the other hand, Spivey's (1990, 1997, 2001) model of discourse synthesis is highly relevant to the reading-into-writing processes described in this present study. Spivey and King (1989) argue that reading-into-writing tasks engage students in three "very basic" processes as they transform knowledge gained from the reading in writing. Most L1 writers transform information by (a) *selecting* relevant content from multiple sources; (b) *organising* the content according to the writing goals; and (c) *connecting* the content from different sources and generating links between these ideas. Spivey's discourse synthesis model has laid an important foundation for researchers to examine the processes involved in reading-into-writing activities. However, the model, rooted in the constructivist tradition of reading research, excludes other important writing processes such as those specified by Shaw and Weir (2007).

Building upon work by Spivey (1990) and Shaw and Weir (2007) works, Chan (2013) investigated 200 undergraduates' processes on two real-life academic writing tasks and two integrated reading-into-writing test tasks at the CEFR B2 and C1 levels. The results of Exploratory Factor Analyses on the questionnaire data show that when writing from sources, the students went through 11 processes in five cognitive phases: *conceptualisation*, *meaning construction*, *organising ideas*, *monitoring and revising*, and *after writing monitoring and revising* (see Table 1).

Table 1 *Model of Reading-into-Writing (Adapted from Chan, 2013)*

Cognitive phases	Processes
Conceptualisation	Task representation Macro-planning
Meaning construction	Global careful reading Selecting relevant ideas Connecting ideas from multiple sources
Organising ideas	Organising intertextual relationship between ideas Organising ideas in a textual structure
Monitoring and revising	Monitoring and revising during text production at low-level Monitoring and revising during text production at high-level Monitoring and revising after text production at low-level Monitoring and revising after text production at high-level

The results also show that the higher-scoring students reported employing most of these 11 processes more than the low-scoring students. As a result, Chan (2013) argued that these processes could be useful cognitive parameters for reading-into-writing tests. Chan's (2013) study has provided some useful indications of the construct of reading-into-writing skills in the academic domain at the higher levels of CEFR. However, empirical evidence regarding the progression of reading-into-writing skills at different levels remains limited, awaiting the findings of studies such as the study reported in this paper.

Evidence of the Developmental Progression in L2 Reading-into-Writing

Cumming, Lai, and Cho (2016) reviewed 69 empirical studies on writing from sources published from 1993 to 2013. One key finding which emerged from their analyses is that the students' reading-into-writing skills develop strategically and progressively during academic studies. Here we review the

main findings regarding how reading-into-writing abilities might develop.

Building an accurate task representation is essential for a successful completion of reading-into-writing tasks. Plakans (2010) reported that students with more academic experience have a more accurate task representation, especially in relation to their understanding of the purpose of the source materials, than those with less academic writing experience. Lower proficiency students often fail to recognise the need to integrate and transform the sources.

The ability to transform ideas from sources is arguably the most important skill which writers need to develop. Spivey (1990) found that skilled writers are good at distinguishing between important and less important ideas from sources and are able to integrate ideas from multiple sources. Skilled writers tend to develop intertextual representations as they read for writing, for example, by comparing authors' viewpoint across different sources (Britt & Rouet, 2012). Skilled writers also transform perspectives presented in the sources into their own claim on the topic (Haller, 2010; Britt & Rouet, 2012). In contrast, less skilled writers often struggle to connect ideas at the intertextual level. To compensate for the lack of intertextual reading skills, they tend to re-produce ideas, for example, by summarising each source one after another (Flower *et al.*, 1990; Spivey, 1997; Kirkpatrick & Klein, 2009) or by relying on the structure of one source when they organise their own text (Segev-Miller, 2007).

In addition, Keck's (2014) investigation of L1 and L2 students' summarisation abilities reveals that as students make progress in their studies, they develop reading-into-writing skills to enable them to rely less on textual borrowing strategies such as direct copy (i.e., copy the selected texts exactly) or paraphrasing (e.g., making changes to lexis and syntactic structure).

While it is evident from above that reading-into-writing abilities vary at different proficiency levels, empirical evidence of L2 writers' reading-into-writing processes is limited.

Processes Elicited by Reading-into-Writing Tests

Some research has been conducted on test takers' processes on different reading-into-writing task formats, which involve non-verbal materials (Yu *et al.*, 2011; Yang, 2012), a single verbal text (Chan, 2011), multiple verbal materials (Plakans, 2009, 2010; Chan, 2018), multiple verbal and non-verbal materials (Chan *et al.*, 2014). We review the major findings in this section.

Chan (2011) investigated ten university students' processes on the PTE Academic *Summarize Written Text*, which requires test takers to write a one-sentence summary of a passage in ten minutes (Pearson, 2017). Based on three sources of evidence from the screen capture data, researcher's observations, and stimulated recall protocols, the results show that, on average, test takers spent 33.18% of the task time on reading task instructions and the passage, 9.10% on producing own text, 12.33% on revising and 19.42% on pausing. 25.97% of the task time was not used by the students. The protocols show that most students engaged in processes of reading the task prompt and brief macro-planning, reading the source text, identifying key ideas, rereading selected parts of text, organising ideas, translating (i.e., writing), and revising. As a result, Chan (2011) advocates the importance of the role of discourse synthesis in the reading-into-writing construct. However, given the focus of the study was to compare students' processes on the summary task and essay task, the study did not provide insights into the relationship between students' proficiency level and their reading-into-writing processes.

Others investigated test takers' processes when working with non-verbal inputs, such as diagrams, tables, and charts. Using think-aloud, Yu, Rea-Dickens, and Kiely (2011) examined test takers' processes on different versions of Task 1. Based on the analysis of think-aloud protocols and the post-

task interviews, Yu *et al.* (2011) identified three consecutive processes that most test takers used in completing the tasks, including *comprehending non-graphic task instructions*, *comprehending the components of graphs*, and *re-presenting or re-producing the non-graphic and graphic information*. In addition, test takers were constantly monitoring their graph comprehension and graph re-production. There was also a strong tendency for test takers to make interpretations by connecting the graph information with their own knowledge about the topic, although this was not required by the task. However, again, there was not much discussion about how students at different levels employed these processes. Through a retrospective questionnaire survey, Yang (2012) examined Taiwanese medical students' processes on a graph-based writing task of GEPT-Advanced. The results, similar to Yu *et al.* (2011) identified three consecutive processes that most test takers used in completing the tasks, including *comprehending non-graphic task instructions*, *comprehending the components of graphs*, and *re-presenting or re-producing the non-graphic and graphic information*. Nevertheless, Yang (2012) took a further step to examine the relationship between students' processes and performance, and reported a general positive, but indirect relationship between writers' use of these three processes and their reading-into-writing performance. On the other hand, Plakans and Gebril (2013) investigated features of source use in 480 TOEFL iBT performances which involved integration of reading and listening materials. Although they did not collect actual evidence of students' processes, the results gave some indications of students' processes of source use. By means of textual analysis, they found that high-scoring texts included important ideas from both sources (i.e., reading and listening materials in the context of their study) whereas low scoring texts included ideas mainly from reading and included more direct copying of words and phrases. The findings illustrate that test takers' use of source text has an impact on their performance. However, Plakans and Gebril (2013) noted that the impact of source text use on performance was not linear across different levels.

These studies have clearly showed that reading-into-writing tasks tap into the knowledge transforming approach to writing (Segev-Miller, 2001; Plakans, 2009, 2010) in which ideas are transformed through a series of higher-order processes of selecting, connecting and organising ideas from sources. However, the nature of L2 reading-into-writing skills at different levels needs urgent attention. The findings of the present study would provide empirical evidence for the cognitive validity of the integrated reading-into-writing test tasks. Unlike the previous studies, this study aims to provide insights into the development of L2 reading-into-writing processes at three levels.

Research Questions

The present empirical study aims to examine test takers' processes on integrated reading-into-writing tasks at three proficiency levels:

1. Is there any difference in students' reading-into-writing processes at the CEFR B1, B2, and C1 levels?
2. Which reading-into-writing processes do students at each level use most?
3. Is there any relationship between students' reading-into-writing processes and their proficiency level?

Research Method

The present study was part of a large-scale project to redevelop the Trinity College London's Integrated Skills of English (ISE) Reading and Writing Examination. ISE consists of two modules, namely *Reading and Writing* and *Speaking and Listening*. The purpose of this study was to examine students' processes on the ISE integrated reading-into-writing task at the B1, B2, and C1 levels. A Writing

Process Questionnaire (WPQ) was used to collect test takers' self-reported data of their use of different processes on the task. The details of the research methods are provided below.

Reading-into-Writing Tasks

The reading-into-writing task at the three ISE levels (ISE I-II-III, corresponding to CEFR B1-B2-C1 respectively) were used in the study. The tasks were developed following a specification of carefully defined cognitive and contextual parameters appropriate at each of the corresponding CEFR level (for more details, see Chan, Inoue, & Taylor, 2015). For example, the linguistic complexity of the input materials at each ISE level was controlled to ensure an appropriate distinction in the level of difficulty across the exam. The reading-into-writing tasks require students to produce an essay by using information from four input texts. Table 2 outlines the task description at the three levels. Sample tasks, test specifications, and further information on scoring can be found on the ISE website (<http://www.trinitycollege.co.uk/site/?id=3192>).

Table 2 *Description of the Three Tasks*

ISE level	Corresponding CEFR level	Task description
ISE I	B1	Writing an essay of 100-130 words using information from four short texts (including three straightforward factual descriptive texts and one non-verbal text) with a total of 400 words.
ISE II	B2	Writing an essay of 150-180 words based on four texts (including three texts with factual ideas, opinions, argument or discussion and one 1 non-verbal text) with a total of 500 words.
ISE III	C1	Writing an essay of 200-230 words based on four texts (including three texts with information, ideas or opinions and one non-verbal input) with a total of 700 words.

Students

A total of 104 English second language learners who were from five L1 backgrounds participated in the study: 34 took ISE I, 35 took ISE II, and 35 took ISE III (see Table 3). All students were preparing for the ISE exam and/or were registered to take the exam, and hence were familiar with the format of the exam.

Table 3 *First Language of the Test Takers*

First language	Frequency	Percent
Bulgarian	10	9.6
Chinese	4	3.8
Italian	13	12.5
Polish	5	4.8
Spanish	61	58.7
Others	11	10.6
Total	104	100.0

Their performances were double-marked by two trained raters using level-specific performance descriptors. Each performance was scored according to four analytical criteria, namely *Reading for Writing*, *Task Fulfillment*, *Organisation*, and *Structure* and *Language Control*. Each of these four criteria could be rated on a 4-point scale (details about the development of the rating scale can be found

in Chan *et al.*, 2015).

Immediately after the test takers had completed the task, they filled in the WPQ to report their use of the target processes. While it is important to note the caveat of the self-report nature of the WPQ, measures were taken to ensure the validity and reliability of the questionnaire data (see the Results section). The questionnaire was developed in Chan's (2013) study which investigated the cognitive processes of university students on a range of reading-into-writing tasks. It is theoretically based on Kellogg's (1996) work and includes relevant content from the work of Shaw and Weir (2007) on the cognitive validity parameters in independent writing tests, the work of Khalifa and Weir (2009) on the cognitive validity parameters in independent reading tests, and Spivey's (1990) model of discourse synthesis. The questionnaire has then been used and validated in several cognitive processing studies (e.g. Chan *et al.*, 2014; Chan, Bax, & Weir, 2018).

In this study, to suit the features of the test task, four additional items (e.g. Items 17, 18, 30, and 41) were added. As a result, the WPQ used in this study consisted of 41 items in total (see Table 3 for a summary of the structure and Appendix 1 for the items).

Table 4 *Structure of the Writing Process Questionnaire (WPQ)*

Cognitive phases	Items
Conceptualisation	1, 2, 3, 4, 5, 11, 20, 25, 27
Meaning construction	6, 7, 9, 10, 12, 14, 17, 18, 19, 23, 24, 26
Organising ideas	8, 13, 15, 16, 21, 22
Monitoring and revising at low-level	30, 31, 34, 37, 38, 41
Monitoring and revising at high-level	28, 29, 32, 33, 35, 36, 39, 40

Data Analysis

We first examined the internal consistency reliability of the WPQ to ensure the validity of the instrument. Descriptive statistics were calculated for the scores of students who chose the options of *definitely agree* and *mostly agree* for each process in the WPQ. A one-way repeated measures analysis of variance (ANOVA) was conducted to investigate whether there was a difference in students' reported use of processes across the three levels (RQ1). We further examined individual processes by comparing percentages of students' reported use of cognitive processes (RQ2). RQ3 was to find out which of the individual processes might best predict writers' reading-into-writing level. After confirming that the data met the pre-requisites for the analysis, including normality, homoscedasticity, linearity, no multicollinearity, and no outliers, the individual process items were analysed using multiple regressions to examine their impact on predicting the writers' level of reading-into-writing abilities. The stepwise method, which includes or removes one independent variable at each step, based on the probability of F, was chosen. To reduce the chances of committing a type one error, the critical significance level (α) was corrected using Bonferroni correction (Brown, 1990).

Findings

Test Scores

As mentioned previously, each script was rated according to four analytical criteria on a 4-point scale (1: a performance below the level; 2: a performance at the level; 3: a good performance; 4: an excellent performance). Further information on the rating scale can be found on the ISE website. Table 5 presents the test scores of the students on the reading-into-writing tasks.

Table 5 *Test Scores*

	ISE I (B1) n=34		ISE II (B2) n=35		ISE II (C1) n=35	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Reading for Writing	2.59	0.70	2.60	0.69	2.54	0.92
Task Fulfillment	2.59	0.61	2.63	0.49	2.71	0.62
Organisation and Structure	2.82	0.67	2.69	0.53	2.77	0.49
Language Control	2.62	0.65	2.66	0.64	2.54	0.66

Internal Consistency Reliability of the Questionnaire Data

Internal consistency reliability (using Cronbach's alpha) was analysed to measure whether items in each of the five cognitive phases behaved consistently. The analysis showed that all five groups achieved a good or excellent internal consistency reliability, ranging from 0.88 to 0.91 ($0.8 > \alpha \geq 0.7$ indicates acceptable internal consistency; $0.9 > \alpha \geq 0.8$ indicates good internal consistency; $\alpha \geq 0.9$ indicate excellent internal consistency) (see Table 6). This gives us confidence that the questionnaire data had good internal consistency reliability.

Table 6 *Internal Consistency Reliability of the Writing Process Questionnaire (WPQ)*

Cognitive phases	No. of items	Internal consistency reliability
Conceptualisation	9	0.91
Meaning construction	12	0.89
Organising ideas	6	0.90
Monitoring and revising (low-level)	6	0.88
Monitoring and revising (high-level)	8	0.89

Differences in students' reading-into-writing processes at B1, B2 and C1 (RQ1)

The WPQ (see Appendix 1) was used to measure test takers' processes on the reading-into-writing tasks at the three levels. Immediately after they had completed the task, the students were asked to report the extent to which they employed each of the 41 target processes in the WPQ on a scale of four with an option for uncertainty (4 - strongly agree; 3 - agree; 2 - disagree; 1 - strongly disagree; 0 - not sure). A higher mean value indicates more agreement that the students employed the target processes on the task. Table 7 presents the overall means of students' use of each target process group.

The results show that the test takers at the three levels reported use of the five reading-into-writing processes with a mean of 2 or above (see Table 7) with a couple of exceptions. Test takers at B1 did not seem to engage much in the monitoring and revising processes (low-level monitoring and revising: $M = 1.95$, $SD = 1.26$; high-level monitoring and revising: $M = 1.74$, $SD = 1.22$). However, this is not unexpected. As shown in previous studies, lower-proficiency writers are less aware of the need to monitor and revise, and less capable of monitoring and revising their writing (Field, 2004; Shaw & Weir, 2007). This is because their primary focus when writing tends to be on how to generate sufficient contents rather than on how well these contents are formulated (Stevenson, Schoonen, & Deglopper, 2006).

More importantly, the results show that test takers at the higher levels reported a higher mean of each process than the test takers at the low levels, although some inconsistencies were observed for the process

Table 7 Use of Processes at Three Levels

	Levels	N	Mean	Std. Dev.
Conceptualisation	B1	30	2.27	0.98
	B2	31	2.76	0.60
	C1	35	2.77	0.52
Meaning construction	B1	30	2.51	1.32
	B2	31	2.90	0.47
	C1	35	3.01	0.49
Organising ideas	B1	30	2.22	1.19
	B2	31	2.70	0.53
	C1	35	2.48	0.79
Monitoring and revising (low level)	B1	30	1.95	1.26
	B2	31	2.42	0.81
	C1	33	2.87	1.05
Monitoring and revising (high level)	B1	30	1.74	1.22
	B2	31	2.29	0.77
	C1	33	2.65	0.81

of organising ideas. In other words, the results indicate a progression of reading-into-writing skills as the higher proficiency students tend to use more of these processes than students at the lower levels. As reported by Plakans (2010), it is likely that, compared to low-proficient students, high-proficient students tend to have a more accurate task representation of integrated tasks and hence recognise the need to integrate and transform the sources. One-way ANOVA analyses were used to test if the differences in means obtained across the levels are significant (see Table 8).

Table 8 One-Way ANOVA of the Use of Reading-into-Writing Processes by CEFR Level

		SS	df	MS	F	p	η^2
Conceptualisation	Between Groups	5.07	2.00	2.54	4.91	0.01	0.1
	Within Groups	48.01	93.00	0.52			
	Total	53.09	95.00				
Meaning construction	Between Groups	4.34	2.00	2.17	3.1	0.05	0.06
	Within Groups	65.17	93.00	0.70			
	Total	69.51	95.00				
Organising ideas	Between Groups	3.55	2.00	1.77	2.33	0.1	0.05
	Within Groups	70.88	93.00	0.76			
	Total	74.43	95.00				
Monitoring and revising (low level)	Between Groups	13.41	2.00	6.71	6.07	0.00	0.12
	Within Groups	100.56	91.00	1.11			
	Total	113.97	93.00				
Monitoring and revising (high level)	Between Groups	13	2.00	6.5	7.25	0.00	0.14
	Within Groups	81.58	91.00	0.90			
	Total	94.58	93.00				

Note. *p < .05. $\eta^2 = .01$ (small effect); $\eta^2 = .06$ (medium effect); $\eta^2 = .14$ (large effect) (Larson-Hall, 2010, p. 119).

As shown in Table 8, differences are significant for four of the process groups: *conceptualisation*, *meaning construction*, *monitoring and revising at low level*, and *monitoring and revising at high level* ($p < .05$). The first three have a medium effect size ($\eta^2 = .10, .06, .12$) and the last one a large effect size ($\eta^2 = .14$). As shown in Table 7, the mean of *organising ideas* at C1 was slightly lower than the mean reported at B2. Although this is somewhat unexpected, the difference is non-significant. It is recommended that further evidence needs to be collected regarding the process of organising ideas elicited at C1 in future studies. To have a better understanding of the students' reading-into-writing skills elicited at the three levels, we now report the individual processes which were predominantly reported by most test takers at each level.

The Predominant Processes used by Test Takers at B1, B2, and C1 (RQ2)

The WPQ items were further classified into three categories according to the percentage of students' agreement on the item (see Table 9). First, the results show that a clear majority of the 41 target processes were reported by at least 40% of the test takers at the two lower levels (36 at B1; 38 at B2) while all 41 processes were reported by at least 40% of the test takers at C1 (see Table 8 for a summary; Appendix 1 for the full results). In addition, since most previous studies set the threshold at 60% or above (e.g., Weir, O'Sullivan, Jin, & Bax, 2007; Jin & Yan, 2017), we examined the processes which were reported by 70% or more students at each level. Most students (70% or above) at B1 reported using fewer processes (14 out of 41) than the students at the other two higher levels (29 out of 41 at both B2 and C1) (see Table 9 for a summary; Appendix 1 for the full results). This again shows a clear progression of the reading-into-writing skills as the proficiency level of the students increases from B1 to B2 and C1. It seems that most students at B1 have only mastered some of the reading-into-writing skills whereas most students at B2 and C1 report using most of the processes. This echoes previous findings that the features of test takers' source text use were distinct across different levels and the impact of their source text use on test performance was not linear (Plakans, 2010; Yang, 2012; Plakans & Gebriel, 2013; Keck, 2014). However, the findings of this study specifically indicate which reading-into-writing sub-skills were more predominant at each of the three levels. We discuss the implications of this finding in the Discussion section.

Table 9 Agreement Percentage of Students' Use of Individual Processes Across Levels

	B1	B2	C1
70% or above	1,6,7,9,10,11,17, 18,23,25,26,29,30,31	1,2,3,4,5,6,7,8,9,10,11, 15,16,17,18,19,23,24,25, 26,28,29,30,31,32,33,34, 37,38	1,2,3,4,5,6,7,8,9,10,16, 17,18,19,23,24,26,28,29, 30,31,32,34,35,36,37,38, 39,41
41% - 69%	2,3,5,8,12,13,14,15,16, 19,21,22,24,28,32,34,35, 36,37,38,39	13,14,21,22,35,36,39,40, 41	11,12,13,14,15,20,21,22, 25,27,33,40
40% or below	20,27,33,40,41	12,20,27	N/A

Relationships between Processes and Proficiency Level

Finally, to explore the relationships between processes and students' proficiency level, we investigated which of the 41 individual processes might be best to distinguish students at different levels. The Spearman's rho correlation analysis established that there was a significant positive correlation, ranging from $r(102) = .239, p < .01$ to $r(102) = .459, p < .01$, between 24 processes and the corresponding

CEFR level. Using the Stepwise method, a multiple regression analysis of the students' proficiency level was performed on these 24 processes. The critical significance level (alpha), adjusted using Bonferroni correction, was 0.016.

As shown in Table 10, the use of five processes significantly predicted students' proficiency level. These processes included rereading task instructions (Item 25), making better connections across the reading materials (Item 24), and three after-writing revising processes to check relevance of content, language, and task fulfilment (Items 35, 38, and 41). The use of these five processes together explained 53.1% of the variance of the students' level, indicating medium level of predictive power. In the main, more students at the higher levels were able to connect ideas across sources and revised their text after writing than the B1 students (see Table 11). However, while more than 70% of the B1 and B2 students reread the task instructions again during reading, less than half of the C1 students did so.

Table 10 *Multiple Regression Analysis of Individual Processes on Students' Proficiency Level*

	B (Unstandardised regression coefficient)	Standard error	β (Standardised regression coefficient)	t	Sig.
Item 24	.187	.064	.287	2.935	.004
Item 41	.225	.055	.428	4.069	.000
Item 25	-.201	.050	-.352	-4.015	.000
Item 38	-.220	.060	-.424	-3.638	.000
Item 35	.207	.056	.382	3.698	.000
R ²					
F					

Table 11 *Use of Five Processes which Best Distinguish Students' Level*

		B1	B2	C1
		% of students who agreed		
24	I made better connections across the reading texts.	46.7	93.5	82.9
25	I read the task instructions again while reading the passages.	73.3	71.0	48.6
35	After writing the 1st draft, I checked that the content I chose was relevant, and revised my writing if necessary.	43.3	58.1	76.5
38	After writing the 1st draft, I checked that I completed all the task requirements, and revised my writing if necessary.	53.3	71.0	84.8
41	After writing the 1st draft, I checked that the language (e.g. grammar, spelling, vocabulary, sentences, etc.) of my writing was good, and revised my writing if necessary.	30.0	58.1	75.8

Discussion

Reading-into-Writing Skills Elicited by Integrated Tasks

As described above, twelve of the 41 processes appear to be essential for a successful completion of the reading-into-writing tasks at the three levels (see Table 12). The findings show that the integrated

tasks engage most students in conceptualisation to understand the task instructions (Item 1); careful reading to comprehend ideas at the global level (Items 6 and 7); expeditious reading to search for parts of the sources which are relevant to the writing task and reading these parts carefully (Items 9, 10, and 26). The tasks also encourage students to connect to the representations they built from the previous reading comprehension section of the exam (Items 17 and 18). Furthermore, the tasks allow students to generate new ideas through writing about the sources (Item 23). Regarding monitoring and revising, most students across levels checked their writing in relation to task fulfilment, appropriateness of ideas transformed from sources, and language in source use (Items 29, 30, and 31). In other words, the findings show that the integrated tasks consistently engage most students at the three levels in knowledge transforming (Bereiter & Scardamalia, 1987) through task representation, higher-order reading processes to select and connect ideas, and revisions. As indicated by previous studies, the processes of discourse synthesis (Spivey, 1990) are essential for a successful completion of integrated reading-into-writing tasks (Plakans, 2010; Chan, 2011; Plakans & Gebril, 2013; Chan *et al.*, 2014). Nevertheless, the results indicate that organising, one key process of discourse synthesis, does not seem to come into play at B1. We will explore this issue in the following section.

Table 12 *Processes Reported by Most Students at B1, B2, and C1*

Items	Individual processes
1	I read the task instructions carefully and slowly.
6	I read through the whole of each reading text carefully.
7	I read the whole of each reading text more than once.
9	I searched quickly for part(s) of the texts that were useful for doing the task.
10	I read some relevant part(s) of the texts slowly and carefully.
17	I looked back at my answers to Part 2A Q1-10 to help my writing.
18	I looked back at my answers to Part 2A Q11-15 to help my writing.
23	I developed new ideas about the sources while I was writing.
26	I read some of the reading passages again.
29	I checked that the ideas I used from the reading texts fitted the purpose of my writing and revised my writing if necessary.
30	I checked that I used my own words to write about the ideas from the reading texts and revised my writing if necessary.
31	I checked that I completed all the task requirements and revised my writing if necessary.

Development of Reading-into-Writing Skills at B1, B2, and C1 - a Threshold post B1?

Aligning with the literature (Belcher & Hirvela, 2001; Yang, 2012; Chan, 2013; Chan *et al.* 2014), the findings indicate that higher proficiency L2 students tend to employ a wider range of higher order processes to complete the reading-into-writing tasks than the lower proficiency ones (see Table 13).

In addition to the L2 processes discussed above, at least 70% students at B2 and C1 reported macro-planning in relation to ideas, reader's expectations, and the communicative purpose of the task (Items 2, 3, and 5). They reported that they could understand the task instructions very well (Item 4). Furthermore, at B2 and C1, most students constructed meaning through high-order reading processes to locate key information and connect the sources by linking these ideas (Items 8, 16, 19, and 24). Students at these two higher levels also monitored and revised aspects of their writing in relation to relevance of ideas, communicative effect, and language (Items 28, 32, and 34). It is also worth noting that most students at B2 and C1 started to revise their text after writing (Items 37 and 38).

Table 13 Processes which were Reported by Most Students at B2 and C1

Items	Individual processes
2	I thought of what I might need to write to make my writing relevant and adequate.
3	I thought about how my writing would fit well with the reader's expectations.
4	I was able to understand the task instructions very well.
5	I thought about the communicative purpose of the task.
8	I used my knowledge of how texts like these are organized to find key information.
16	I worked out how the main ideas across the reading texts related to each other.
19	I developed new ideas or a better understanding of my own knowledge while reading
24	I made better connections across the reading texts while writing.
28	I checked that the content I chose was relevant and revised my writing if necessary.
32	I checked that my writing had a good communicative effect on the reader and revised my writing if necessary.
34	I checked that the language (e.g. grammar, spelling, vocabulary, sentences, etc.) of my writing was good, and revised my writing if necessary.
37	After writing the 1st draft, I checked that I used my own words to write about the ideas from the reading texts and revised my writing if necessary.
38	After writing the 1st draft, I checked that I completed all the task requirements, and revised my writing if necessary.

Table 14 Post Writing Revising by C1 Students

	% of students who agreed
After writing the 1st draft, I checked that, and revised my writing if necessary.	
the content I chose was relevant	76.5
the ideas I used from the reading texts fitted the purpose of my writing	78.8
I used my own words to write about the ideas from the reading texts	87.9
I completed all the task requirements	84.8
my writing had a good communicative effect on the reader	72.7
my writing was clear, coherent and well-organized	57.6
the language (e.g. grammar, spelling, vocabulary, sentences, etc.) of my writing was good.	75.8

While the predominant processes reported by the B2 and C1 students were similar, a noticeable progression of the reading-into-writing skills at C1 was that most students at this level revised their text after writing (see Table 14). This agrees with the literature that skilled writers are more aware of the need to revise their text during and after writing than lower-proficient writers (Kellogg, 1996; Stevenson, Schoonen, & Deglopper, 2006; Kirkpatrick & Klein 2016).

Conclusion

While the integrated reading-into-writing format is widely adopted in writing assessments, there is a need to better define the construct of reading-into-writing processes at different proficiency levels. Our study is unique in its exploration of L2 test takers' reading-into-writing processes at three levels. The findings of the study provide some evidence of the cognitive validity of the integrated reading-into-

writing tasks, such as the ISE tasks used in this study, in two ways. First, the integrated tasks appear to elicit from test takers a knowledge transforming approach to writing (Bereiter & Scardamalia, 1987) in which they develop an intertextual representation of the source texts and transform the ideas in relation to the task at hand. As reported by students at the three levels, most students engaged in processes of task conceptualisation, global careful reading, search reading, selective reading, generating new ideas through writing, monitoring and revising in relation to task fulfilment, appropriateness of ideas, and language in source use. This has important implications for language teachers and language testing practitioners who need to teach/assess these reading-into-writing skills. Most importantly, the results indicate a clear progression of the L2 reading-into-writing sub-skills at B1, B2, and C1. In the main, students at higher levels reported using a wider range and more demanding reading-into-writing processes than the lower proficiency students. The results suggest that there is a relationship between level of the test and engagement in higher level reading-into-writing processes, which supports the validity of the test suite. It is also interesting to observe that most B1 students in this study did not engage in organising processes when they completed the integrated task. This is contradictory to previous research suggesting that students often organise ideas from sources in integrated tasks (e.g., Spivey, 1990; Plakans, 2009). Additional research is needed to confirm whether L2 students tend to develop these organising processes at a later stage than the selecting and connecting processes.

Another important observation is that C1 students in this study engaged much more fully in post-writing revising processes than the B1 and B2 students, mirroring more closely what skilled writers would normally do in real-life. It is plausible to assign more weight to some sub-processes over the others in the rating scale to better reflect the relative significance of the reading-into-writing sub-skills at different levels. This would lead to a better and more precise score interpretation.

However, as previously discussed, these findings must be examined with some caution. First, the results were interpreted based on questionnaire data. It was therefore essential to ensure the validity of the data. The questionnaire in this study was constructed with great care following the recommendations of Purpura (1998) on the use of cognitive process questionnaires. For example, the psychometric characteristics of the questionnaire and the underlying construct validity of the questionnaire were verified by a series of statistical analyses. In addition, only one task was used at each CEFR level. The level of the tasks used was validated through a *a priori* approach to language test development (Shaw & Weir, 2007). The tasks were developed based on carefully specified contextual and cognitive parameters appropriate to each corresponding CEFR level. For example, the input texts were analysed in relation to lexical complexity, syntactic complexity, and degree of coherence within and across levels (details of the test development are available in Chan *et al.*, 2015). However, since only one task was used at each level in this study, the features of these tasks (e.g., with multiple passages and non-verbal input) should be considered when we interpret the findings of the reading-into-writing processes at each level. It should also be noted that the present study was mainly conducted with students who were studying in the European contexts in which integrated tasks have been commonly used. The developmental profile of L2 students' reading-into-writing skills may be different in other educational contexts. Therefore, further research is needed to confirm the generalisability of the findings of the present study.

In short, the findings of this study contribute to our understanding of the L2 reading-into-writing skills at three levels. The observations about how students might develop the reading-into-writing sub-skills made in the study should be followed up in future studies to obtain a more complete understanding of L2 reading-into-writing skills. In the next phase of the research, we intend to investigate the extent to which these differences in test takers' reading-into-writing processes observed at the three levels manifest within the textual features of the written performances.

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Appendix 1

Percentage of Agreement/Disagreement of Using Each Process

Items		B1		B2		C1	
		Agree	Disagree	Agree	Disagree	Agree	Disagree
1	I read the task instructions carefully and slowly.	83.3	16.7	90.3	9.7	91.4	8.6
2	I thought of what I might need to write to make my writing relevant and adequate.	66.7	33.3	93.5	6.5	94.3	5.7
3	I thought about how my writing would fit well with the reader's expectations.	56.7	43.3	90.3	9.7	77.1	22.9
4	I was able to understand the task instructions very well.	73.3	26.7	83.9	16.1	97.1	2.9
5	I thought about the communicative purpose of the task.	60.0	40.0	77.4	22.6	82.9	17.1
6	I read through the whole of each reading text carefully.	83.3	16.7	90.3	9.7	97.1	2.9
7	I read the whole of each reading text more than once.	76.7	23.3	80.6	19.4	82.9	17.1
8	I used my knowledge of how texts like these are organised to find key information.	66.7	33.3	90.3	9.7	77.1	22.9

9	I searched quickly for part(s) of the texts that were useful for doing the task.	80.0	20.0	74.2	25.8	82.9	17.1
10	I read some relevant part(s) of the texts slowly and carefully.	80.0	20.0	83.9	16.1	91.4	8.6
11	I read the task instructions again while reading the passages.	83.3	16.7	74.2	25.8	57.1	42.9
12	I took notes on or underlined the important ideas in the reading texts.	53.3	46.7	35.5	64.5	60.0	40.0
13	I listed the key ideas in order of importance.	50.0	50.0	58.1	41.9	54.3	45.7
14	I linked the important ideas in the reading texts to what I know already.	50.0	50.0	64.5	35.5	54.3	45.7
15	I worked out how the main ideas in each reading text related to each other.	50.0	50.0	71.0	29.0	60.0	40.0
16	I worked out how the main ideas across the reading texts related to each other.	53.3	46.7	77.4	22.6	77.1	22.9
17	I looked back at my answers to Part 2A Q1-10 to help my writing.	70.0	30.0	80.6	19.4	74.3	25.7
18	I looked back at my answers to Part 2A Q11-15 to help my writing.	70.0	30.0	71.0	29.0	85.7	14.3
19	I developed new ideas or a better understanding of my own knowledge.	60.0	40.0	83.9	16.1	74.3	25.7
20	I changed my writing plan while I was reading the source texts.	20.0	80.0	29.0	71.0	40.0	60.0
21	I recombined or reordered the ideas I first planned to write to fit my writing.	63.3	36.7	51.6	48.4	48.6	51.4
22	I removed some of the ideas I first planned to write.	60.0	40.0	54.8	45.2	65.7	34.3
23	I developed new ideas while I was writing.	73.3	26.7	83.9	16.1	97.1	2.9
24	I made better connections across the reading texts.	46.7	53.3	93.5	6.5	82.9	17.1
25	I read the task instructions again while reading the passages.	73.3	26.7	71.0	29.0	48.6	51.4
26	I read some of the reading passages again.	76.7	23.3	80.6	19.4	77.1	22.9
27	I changed my writing plan while I was writing.	30.0	70.0	35.5	64.5	42.9	57.1
28	I checked that the content I chose was relevant and revised my writing if necessary.	56.7	43.3	80.6	19.4	79.4	20.6
29	I checked that the ideas I used from the reading texts fitted the purpose of my writing and revised my writing if necessary.	73.3	26.7	80.6	19.4	91.2	8.8
30	I checked that I used my own words to	70.0	30.0	93.5	6.5	88.2	11.8

	write about the ideas from the reading texts and revised my writing if necessary.						
31	I checked that I completed all the task requirements and revised my writing if necessary.	70.0	30.0	80.6	19.4	82.4	17.6
32	I checked that my writing had a good communicative effect on the reader and revised my writing if necessary.	60.0	40.0	77.4	22.6	73.5	26.5
33	I checked that my writing was clear, coherent and well-organised, and revised my writing if necessary.	36.7	63.3	74.2	25.8	58.8	41.2
34	I checked that the language (e.g. grammar, spelling, vocabulary, sentences, etc.) of my writing was good, and revised my writing if necessary.	46.7	53.3	71.0	29.0	79.4	20.6
35	After writing the 1st draft, I checked that the content I chose was relevant, and revised my writing if necessary.	43.3	56.7	58.1	41.9	76.5	23.5
36	After writing the 1st draft, I checked that the ideas I used from the reading texts fitted the purpose of my writing and revised my writing if necessary.	56.7	43.3	58.1	41.9	78.8	21.2
37	After writing the 1st draft, I checked that I used my own words to write about the ideas from the reading texts and revised my writing if necessary.	60.0	40.0	71.0	29.0	87.9	12.1
38	After writing the 1st draft, I checked that I completed all the task requirements, and revised my writing if necessary.	53.3	46.7	71.0	29.0	84.8	15.2
39	After writing the 1st draft, I checked that my writing had a good communicative effect on the reader and revised my writing if necessary.	43.3	56.7	64.5	35.5	72.7	27.3
40	After writing the 1st draft, I checked that my writing was clear, coherent and well-organised, and revised my writing if necessary	33.3	66.7	54.8	45.2	57.6	42.4
41	After writing the 1st draft, I checked that the language (e.g. grammar, spelling, vocabulary, sentences, etc.) of my writing was good, and revised my writing if necessary.	30.0	70.0	58.1	41.9	75.8	24.2
