行政院國家科學委員會專題研究計畫 成果報告

整合性寫作測驗題型及寫作策略對於英文寫作表現之析論 研究成果報告(精簡版)

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行政院國家科學委員會補助專題研究計畫 ■ 成 果 報 告 □期中進度報告

整合性寫作測驗題型及寫作策略對於英文寫作表現之析論

An analysis of the relationship of integrated writing test tasks and strategy use to

EFL integrated writing test performance

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摘要

近年來，用來測試學生學術寫作能力的整合性試題越來越受到歡迎。有許多營利性及非營利性的英語測驗都包含了閱讀寫作及圖表寫作的試題。一般而言，傳統獨立寫作試題考核學生對於某一議題本身的思考能力，而整合性英文寫作試題更進一步考核學生是否能擷取、分類並統整參考資料中的重要資訊。相較於獨立寫作試題，整合性寫作試題更接近學術環境中的溝通時況，真實的模擬大學校園中可能遇到的寫作需求。因此整合性寫作試題常被視為可以增進考題的真實性及公平性。同時，也因為此種考試題型測試學生長期累積的英文讀、寫之實力，學生的英語學習也能透過此種評量方式而得到良好的影響，亦即帶動正面的回沖效應(backwash effects)。然而，整合性寫作測驗的整合特質也引發一些與建構效度(construct validity) 相關的爭議。由於測驗的建構效度乃是測驗核心，是用來說明測驗成績(test interpretation)及成績使用(test use)的基礎，深入的了解這兩類試題的構念(construct)是必要的。

本研究以中山醫學大學學生為研究對象，採結構方程模組與質化研究之途徑來瞭解兩類整合性寫作試題—閱讀寫作及圖表寫作試題，及學生寫作策略使用是否影響其各面向的寫作表現。量化分析結果顯示學生使用自我調節、語句精簡、及釋義策略來完成閱讀寫作試題。學生也使用圖表理解、圖表推論、及圖表釋義之策略來完成圖表寫作試題。而這些策略都對學生的寫作表現有正向的影響。

另外，質化分析結果顯示，閱讀寫作與圖表寫作皆要求考生對試題中的文章跟統計圖表有通盤性、而非片段性的理解。然而，相對於圖表寫作，閱讀寫作更能刺激學生與考題互動進而作更深入的思考。這個研究有助於了解台灣英語學習者如何擷取閱讀及圖表綱要來完成寫作考試。藉由追蹤及比較學生的寫作策略使用與各向度之寫作能力，此研究成果也能讓英文教師更了解整合性寫作測驗的本質以提供有效的策略教學來提升大專學生英語寫作能力。

關鍵字：學術寫作、寫作測驗、寫作策略、整合性寫作試題

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整合性寫作測驗題型及寫作策略對於英文寫作表現之析論

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Abstract

In recent years, the use of integrated writing tasks for assessing academic writing in English has been increasing in popularity. A number of commercial language tests and in-house writing tests have included integrated reading-based writing (RW) tasks and graph-based writing (GW) tasks in their assessment batteries. These tasks are proposed to offer more authenticity, improve fairness, and provide positive washback effects of the test on learning and teaching of English. However, the integrated nature of these tasks can pose issues of test development and constructed-related validity. Given that the inferences made from test scores depend upon the construct of the measure, it is important to have a deeper understanding of the constructs measured by these two task types. This project investigates the effects of the types of source texts, namely verbal and visual texts, in the prompts and test takers' strategy use on their test performance.

Participants were 287 undergraduate students enrolled in Chung Shan Medical University. They were recruited to take RW and GW tests, followed by a strategy inventory on how they thought while completing the test. Ten additional students were invited to complete a RW and GW tasks, and participate in think-aloud sessions and retrospective interviews. The data were analyzed quantitatively and qualitatively. Exploratory factor analysis (EFA) was be used to identify the link between strategy use (latent variables) and student essays (measured variables). Drawing upon previous writing research, confirmatory factor analysis (CFA) was utilized to test the hypothetical relations between observed and latent variables. A structural equation modeling (SEM) was used to model relationships between students' self-reported writing strategy use and their writing performance. The data collected from think-alould sessions and retrospective interviews were analyzed to provide supplementary information in interpreting the quantitative data.

The quantitative results indicated that writers responding to the RW task were engaged in self-regulating, discourse synthesis, and paraphrasing strategies. These strategies exerted positive impact on their test performance. Writers engaged in the GW task were found to use graph comprehension, graph interpretation, and graph translation strategies during the task and the use of these strategies generally had positive impact on their writing performance.

The qualitative results reveal that both RW task and GW task required examinees to comprehend source information at a global level. Some differences, however, were shown across tasks and writers at different score levels, with the RW tasks eliciting a more facilitative and interactive process than the GW tasks for the higher scoring writers. The findings of the study provide insights into the nature of RW and GW tasks and may contribute to the validity of source-based writing tasks. The study also has implications for second language writing assessment and instruction.

Keywords: Academic writing, writing assessment, writing strategies, integrated writing tasks

I Introduction

A great number of university assignments involve writing from various sources (Horowitz, 1986; Kirkland & Saunders, 1991) because the ability to integrate source information into writing has been considered crucial to achieve academic success (Campbell, 1990; Leki & Carson, 1997). Many language tests, therefore, have also begun to incorporate tasks requiring writers to compose from sources into their assessment batteries (e.g., Test of English as a Foreign Language – TOEFL, Canadian Academic English Language Assessment – CAEL, International English Language Testing System – IELTS, General English Proficiency Test – GEPT). Due to their resemblance to real-life academic writing tasks, these source-based tasks are seen to promote test fairness (Feak & Dobson, 1996; Read, 1990) and increase positive impacts on learning and teaching (Cumming, Grant, Mulcahy-Ernt, & Powers, 2004; Fox, 2004). Considering their growing popularity in both academic settings and language testing contexts, it is important to explore the nature of these tasks. The present study sought to investigate how Taiwanese writers approach two types of source-based writing tasks, RW tasks and GW tasks, and how their strategy use during these tasks affect their writing performance.

II Background

Since the late 1980s, research on test-taking processes and strategies has thrived. A number of studies have focused on whether test-takers complete test tasks in the manner related to the cognitive and linguistic processes or strategies found in actual writing contexts (e.g., Anderson, 1989; Anderson, 1991; Cohen, 1984; Homburg & Spaan, 1981) given that the findings from process and strategy research may provide useful information regarding the construct validity of the tests (Bachman, 2002; Cohen, 2006). Most process and strategy research has focused on test-takers' mental operations responding to selected-response items (e.g., multiple choice, drag-and-drop, cloze) in reading and listening comprehension tests (Anderson, Bachman, Perkins, & Cohen, 1991; Cohen & Upton, 2007; Douglas & Hegelheimer, 2006). Little is known about how test-takers respond to constructed-response items (e.g., writing) (Cohen, 1994). In order to explore the nature of source-based writing tasks, it is necessary to examine how writers approach the source texts and how their strategies may vary across tasks and writers.

1 Strategies on reading-based writing

Strategy research has long been of interest to writing scholars. A large number of researchers have indicated main approaches first language (L1) writers use to complete a writing task, such as cognitive models of composing processes (Bereiter & Scardamalia, 1987; Flower & Hayes, 1981; Hayes, 1996; Kellogg, 1996), models of discourse construction (Flower, 1994; Flower et al., 1990), and constructivist models of discourse synthesis (Spivey, 1984, 1990, 1997; Spivey & King, 1989), and these theories have been extensively applied to second language (L2) strategy research. For instance, a few L2 research studies (Asención Delaney, 2008; Asención, 2004; Plakans, 2009) have applied the discourse synthesis models (Spivey, 1984, 1990, 1997; Spivey & King, 1989) as the fundamental frameworks to specify reading-writing interactions. The major processes involved in these models were *organizing, selecting,* and *connecting*. In *organizing*, readers/writers refer to the organization of the source text in identifying the general ideas of the text. *Selecting* is when readers/writers extract the most crucial chunks of information from a pool of information units, and subsequently include the selected ones for their own writing. During *connecting*, writers link their prior knowledge to the information in the source texts. These studies contribute a better understanding of main

processes involved in reading-based writing and serve as the basis for interpreting writers' composing strategies in the study.

2 Strategies on graph-based writing

Although little language testing research has examined the strategies engaged in responding to graph-based assessment tasks, L1 cognitive psychology theories offer useful frameworks of graph comprehension that may provide some insights into the interactions between test-takers and graphical inputs.

Three central processes emerged during graph comprehension have been identified in previous literature: encoding a graph, interpreting a graphs, and associating one graph feature to another graph feature (Bertin, 1983; Carpenter & Shah, 1998; Kosslyn, 1989; Lohse, 1993; Pinker, 1990). Some studies analyzed how people interpret a specific graph format. Carswell, Emery, Lonon (1993) found that participants were constantly engaged in *global productivity* and *local productivity*. Gillan and Lewis (1994) found that many participants mentally compared one wedge with the other in reading pie charts.

Few studies have addressed graph comprehension and interpretation in a language testing context. For instance, Bridges (2010) and Mickan, Slater, and Gibson (2000) have focused on the processes and strategies involved in graph-based writing tasks in the IELTS. Bridges (2010) examined the test-taking processes used by sixty IELTS candidates when they responded to a graph or diagrammatic prompt. The study found six processes commonly applied to complete IELTS Academic Writing Task 1: macro-planning, organizing, micro-planning, translating, monitoring, and revising. The findings showed that macro-planning and monitoring were used more frequently for more proficient writers than less proficient ones. The questionnaire used in the study focused mainly on self-regulation operations while interactions between graph reading and writing were rarely discussed.

The studies reviewed above illuminate strategies used by writers when responding to RW and GW tasks. To add to this strand of literature, the present study examines Taiwanese writers' composing strategies and their relationship to test performance. The study also looked at the similarities and differences in their strategy use across tasks and writers.

III Method

1 Participants

The study participants consisted of undergraduate students enrolled in Chung Shan Medical University in Taiwan. A total of three hundred fifteen students were asked to complete a RW and a GW task, followed by an inventory consisting of the RW Strategy Inventory and GW Strategy Inventory. Of the 287 voluntary questionnaire respondents, 57.8% (*n* = 166) were female and 42.2% were male (*n* = 121). The average age of the participants was 19.38 years (*SD* = 1.58). Ten additional participants were invited to participate in concurrent think-aloud and interviews sessions. These participants represented a variety of disciplines including dentistry, nursing, optometry, medical imaging, physical therapy, and health care management. Before taking the exam, they had been instructed in class about how to approach both RW and GW tasks.

2 Instruments

Six instruments including the strategy inventory, tasks, and scoring rubrics for RW and GW tasks were used in the study. The strategy inventory was developed and used to elicit information on participants' strategy use

during each type of task, and assessment tasks were used to assess students' integrated writing ability. The scoring rubrics were used to evaluate response essays.

a The RW and GW Strategy Inventories: The two types of strategy inventories, the RW and GW strategy inventories with 6-point Likert items anchored by 'never' (0) and 'always' (5) were developed to measure strategy use during the RW and GW tasks. To establish content validity, three writing experts were consulted to examine item comprehensibility and clarity. Then prior to their actual use, the preliminary inventories were piloted with 115 participants for reliability. A few items were not included as a result of low item-total correlations and alpha. The final modified inventory consists of 26 and 33 items for the RW and GW tasks respectively. Following EFAs, CFAs utilizing Maximum Likelihood (ML) estimation were conducted with the AMOS 16.0 statistical program (Arbuckle, 2007) to compare and evaluate different measurement models of strategy use. All composites of strategy use items revealed reasonable levels of reliability and validity and served as the final measurement model for the SEM analyses.

b. RW and GW tasks: Two argumentative source-based test tasks aimed to prompt academic writing skills were developed for the study: one RW and GW task. The argumentative genre was used given that it was very common in many academic settings (Cumming et al., 2005). In the development of the RW task, excerpts were selected from multiple source texts such as textbooks, magazines, and the Internet for the purpose of enhancing the authenticity of the task. Following Lewkowicz's (1994) suggestion of using more than one source text for reading-based writing tasks, two short passages demonstrating opposing perspectives of the same issue were included in the RW task. These passages were adjusted to be similar in length, organization, and readability based on the following criteria: Flesch Kincaid Grade level between 11 to 12; Flesch Reading Ease score between 40 to 60; and word count between 210 to 250. On the other hand, the GW task incorporating common forms of charts, line and pie charts, were developed to stimulate test-takers to demonstrate their ability to comprehend, interpret, and make connections among pieces of graphical information. These tasks were reviewed by writing experts and piloted with 30 undergraduate students before they were administered to the study participants.

c. The RW and GW scoring rubrics: In order to examine how test-takers' strategy use affected the different aspects of writing performance, participants' responses toward the RW and GW tasks were assessed using the rubrics consisting of four scales (content, organization, language use, and source use) and three scales (content, organization, and language use) respectively. These scales were developed by adapting the TOEFL, the GEPT writing, and the IELTS writing scoring rubrics. Each scale is divided into six levels with score points from 0 to 5. Prior to the scoring session, all raters were invited to participate in training sessions in which they reviewed task requirements, scoring criteria, and anchor essays that illustrated the idiosyncrasy within each score level. Utilizing Spearman rank-order correlation coefficient (rho), the resulting inter-rater reliability estimates for 'content,' 'organization,' 'language use,' and 'source use' were fairly high (all above .85).

3 Data analyses

a. Quantitative Analyses

The primary procedure of analysis was a SEM because of two reasons: 1) it considers the measurement errors so that the relationships among variables can be more accurately estimated compared to other multivariate methods (e.g., regression analysis, ANOVA) (Jöreskog & Sörbom, 1989; Stevens, 1992); 2) it allows simultaneous examination of a set of latent and measured variables (Byrne, 1994). The data were first examined for univariate and multivariate normality and then submitted to a series of EFA and CFA in examining the proposed relationships between strategy use and test performance. SEM analyses were subsequently conducted to explore the associations among measured and latent variables in the model. Using ML estimation procedures, proposed models were evaluated based on goodness-of-fit indices: the chi-square difference test (χ^2), the root mean square error of approximation (RMSEA), standardized root mean square residual (SRMR), comparative fit index (CFI), Akaike information criterion (AIC) and Tucker-Lewis index (TLI). An acceptable model needs to meet the following criteria: non-significant χ^2, RMSEA ($\leq$ .06), SRMR ($\leq$ .08), CFI ($\geq$ .95), and TLI ($\geq$.95) (Hu & Bentler, 1999).

b. Qualitative Analyses

The think-aloud sessions were audio-recorded, transcribed, and coded for analyses. Transcripts were first segmented into idea units (Kroll, 1977). An idea unit was defined as a single complete piece of information consisting of a phrase, clause or sentence. Unintelligible words or phrases were not included for coding, nor were units that did not express an idea or a thought such as "uh" or "um." Then the study used line-by-line coding approach (Glaser, 1978) to explore patterns and themes in the data. These initial codes, combined with literature described in previous sections, were used to develop the coding scheme. Based on the coding scheme, two coders coded all the protocols with an agreement of 88%. In addition, to allow for identification of the composing sequence, the protocols were reexamined for the groupings of the processes. While the study was primarily qualitative in nature, quantifying the process data helps provide more information on the trends of the processes within and across tasks and writers. Descriptive analyses including frequency counts, percentages, and central tendency statistics were performed to examine the possible differences and similarities exist in EFL writers' processes when composing the RW and GW tasks. The quality of the written texts (*n* = 20) was assessed by two experienced EFL writing teachers with doctoral degrees in Applied Linguistics. The texts were rated holistically based on the content, structure, and language use of the texts. The inter-rater reliability estimates were acceptable with a Spearman Rho of .91 for the RW tasks and the GW tasks.

IV Results and discussion

1 Descriptive statistics

The variables used in the RW analyses include four latent factors and thirteen indicators, and four latent factors and nine indicators in the GW analyses. Before model estimations, univariate and multivariate normality assumptions were examined for the ML procedures. No normality violations were identified. The reliability estimates were satisfactory for all strategy variables, with Cronbach's alpha ranging from .70 to .95.

2 SEM analyses

a. The relationship between RW strategy use and writing test performance

The preliminary model hypothesized the relationships among Self-regulating, Discourse Synthesis, Paraphrasing, and the analytic ratings on the RW task. The model demonstrated an excellent fit to the data (SRMR = .025, RMSEA = .000, TLI = 1.004, CFI = 1.000) and then served as a baseline model for further comparisons. The fit of competing models were examined and compared by constraining the paths from different types of strategy use to Writing Ability, and the paths from one strategy use to another to zero. The fit indices of these competing models suggested that Self-regulating had no direct, but indirect impact on Paraphrasing through Discourse Synthesis. Similarly, Discourse Synthesis had no direct, but indirect influence on test-takers' writing performance via Paraphrasing. Figure 1 presents a diagrammatic representation of the resulting full latent model which consisted of two parts: RW strategy use and test performance. This model exhibits a good representation of the sample data (χ^2 (54) = 46.920, SRMR = .025, RMSEA = .000, TLI = 1.005, CFI = 1.000) and provides a reasonable explanation of the relationships between test-takers' strategy use and their test performance on the RW task. The model was accepted to explore the relationships between RW strategy use and writing test performance.

The full latent model (see Figure 1) indicated that Self-regulating had a significant, direct positive influence on Discourse Synthesis (β = .97) and Writing Ability (β = .35). It also had indirect positive impact on Writing Ability via Discourse Synthesis and Paraphrasing. This suggested that Self-regulating might affect test-takers' writing performance directly, including 'content,' 'organization' and 'language use' aspects of their writing, and served executive control over Discourse Synthesis and Paraphrasing. Discourse Synthesis had a positive indirect influence on test-takers' writing performance by means of Paraphrasing (β = .66). The result suggests that test-takers used Organizing, Selecting, and Connecting strategies to help them determine what to paraphrase and how to paraphrase from the original texts. It echoes the findings in integrated writing literature that source-based writing tasks often require a complex level of cognitive and linguistic processing, including selecting, organizing, and connecting (Mateos, Villalon, de Dios, & Martin, 2007; Spivey, 1997). Paraphrasing had direct and positive impact on Writing Ability (β = .12), however such impact was not significant. It suggests that the RW task required test-takers to use a combination of multiple strategies in order to complete the task successfully. The final model also showed that test-takers' writing ability significantly affected their ability to use source materials (β = .41). This result provides empirical evidence that L2 writers' ability to write is strongly associated with their ability to integrate source information in their writing (Shi, 2004).

In addition to the relationship between L2 writers' strategy use and performance, the model also revealed a positive relationship between the error terms associated with Selecting and Language Use, and a negative relationship between Selecting and Source Use. The finding suggested that the selecting strategies can either facilitate or hamper test-takers' graph writing performance. It is possible that more proficient writers used the selecting strategies to extract important information for writing while less proficient writers selected only fragments from the original texts and inserted key words and sentences in their own writing.

These findings suggested that test-takers needed to actively interact with the source texts and their own texts by engaging in various writing strategies including planning, monitoring, organizing, selecting, connecting, and paraphrasing in order to perform well. Because the RW task elicited the strategies hypothesized in literature on integrated writing (e.g., Esmaeili, 2002; Plakans, 2009a; Spivey & King, 1989),

the findings may provide evidence that the RW task measures the academic writing ability to write from sources.
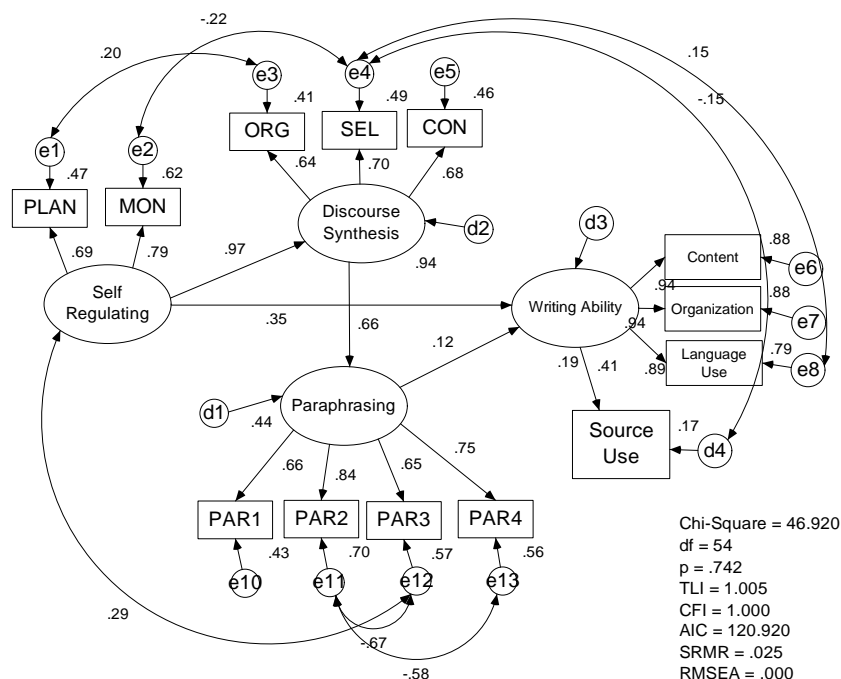

Figure 1 The final latent model (RW)

Note. PLAN = Planning, MON = Monitoring, ORG = Organizing, SEL = Selecting, CON = Connecting, PAR = Paraphrasing. Numbers are standardized estimates.

b. The relationship between GW strategy use and writing test performance

Among various competing models under testing, one full latent model (Figure 2) represented the sample data well (χ^2 (22) = 22.255, SRMR = .031, RMSEA = .006, TLI = 1.000, CFI = 1.000). Considering that the model was statistically and substantially feasible, the model was accepted as a feasible one in explaining the sample data.

Initially Graph Comprehension and Graph Reasoning were both hypothesized to have a direct and positive effect on Graph Writing Ability. These impacts, however, did not appear in the data. Even though Graph Comprehension presented no direct impact on Graph Writing Ability, it had a significant indirect effect (β = .22) on performance via Graph Reasoning. Similarly, Graph Reasoning had a strong indirect effect (β = .23) on performance by means of Graph Translation. All paths were significant at the .001 level.

The fact that graph comprehension and graph reasoning strategy use had no direct effect on graph writing ability seemed somewhat surprising. Such results can be interpreted from two perspectives. First, due to the significant relationships among Graph Comprehension, Graph Reasoning, and Graph Translation, it would not be just to say that Graph Translation alone affected graph writing test performance. The model suggested that Graph Comprehension and Graph Reasoning played mediating roles in the successful completion of the GW task. A lack of one type of strategy use might impede the writing progress. In other words, Graph Comprehension, Graph Reasoning, and Graph Translation worked as a set of strategy repertoire used to satisfy each stage of composing purposes and maximize graph writing performance. Second, the model also suggested the importance of a writer's language resources. With little knowledge in English lexicon and grammar rules, writers would not be able complete the task successfully even if they could understand and interpret graphs reasonably well. The result is in support of Bridges' (2010) finding that

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writers often experience difficulty when it comes to converting graphical information into written words.

The model also pointed to significant negative relationships between the error terms related to LP and Graph Writing Ability. Such relationship appeared logical because the task primarily required writers to identify the trends of the data rather than certain independent, single specifier. The finding suggested that L2 writers' overly attention to details could have a deleterious influence on graph writing performance.
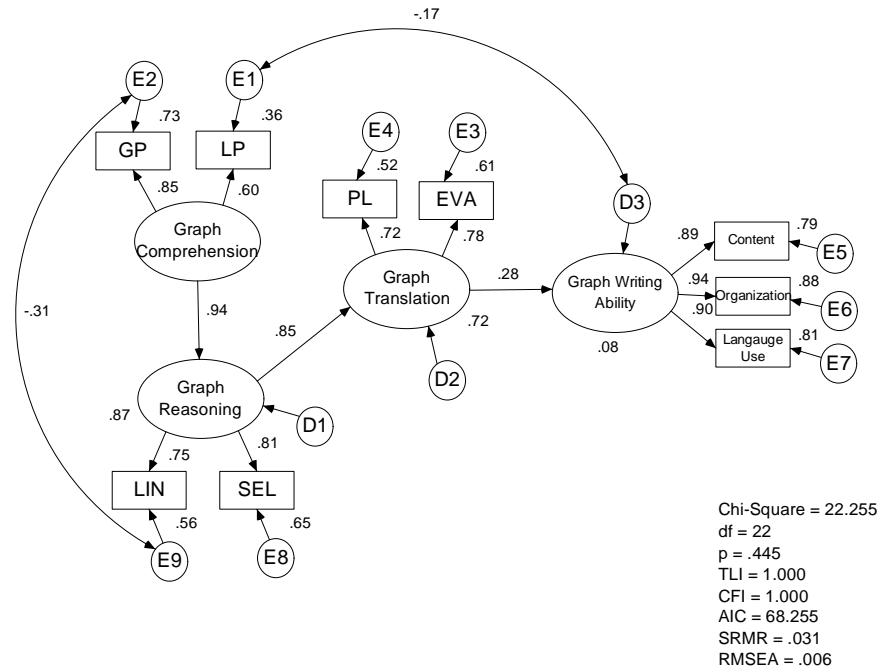

Figure 2 The final latent model (GW)

Note. GP = Global Processing, LP = Local Processing, LIN = Linking, SEL = Selecting, PL = Planning, EVA = Evaluating. Numbers are standardized estimates.

3. Qualitative Analyses

The think-aloud protocols and interview data revealed that all writers were generally engaged in two composing stages: a preparation and a writing stage. During the preparation phase, all writers read task prompts, requirements, and then the source materials. Most of the participants read prompts and task requirements more than once, and subsequently reread some key words and phrases to understand the task purposes further. During the writing phase, the writers used a set of strategies to cull important information to be integrated in their own writing. In the preparation stage, the writers read the source texts for comprehension; and in the writing stage, the writers read the source texts for summarization. As Cohen (1994) pointed out, reading strategies used for comprehension can be very different from those used for summarization due to the different goals they serve.

To examine whether writers with different levels of proficiency used different types of processes, all participants were divided into two groups for comparison based on their writing scores. Writer A, B, C and H were selected to represent the more proficient group (High group), and Writer D, E, F, G, I, and J were selected to represent the less proficient group (Low group). Figure 3 presents a bar graph with the percentage of each process employed by the high and low group.

The results showed different patterns of composing processes between the High and the Low groups. High group engaged in more *global processing, linking, formulating,* and *revising* than the Low group during the RW and GW tasks. The Low group engaged in more *local processing* than the High group for both tasks. The

think-aloud protocols also reflected that writers in the High group frequently reread titles, identified organizations (e.g., topic sentence, graph structures), and skimmed for gist and trends of the source materials. Writers in the Low group tended to break sentences into parts and resort to translation as a means to understand the texts better for the RW tasks and focus on data point values for the GW tasks.

Interestingly, although *global processing* was employed more frequently by the High group than the Low group during the GW tasks, the difference was fairly small. This appeared to reflect the differences in the nature of these two types of tasks. The RW tasks require a mastery of threshold reading comprehension skill while the GW tasks do not. In other words, writers with little comprehension of word- or sentence-level information might have difficulty capturing the central ideas of the passages and thus engaging in *global processing* when responding to the RW tasks. On the other hand, the GW tasks do not require a minimum reading ability, yet several writers from both High (A, B, C) and Low groups (D, E, J) had indicated in their interviews that they felt the GW tasks were more challenging because they had to "translate" source graphs into written texts. This difference can also be reflected in the degree of *monitoring* and *examining task* by writers. During the GW tasks, the High group demanded more attentional resources to improving mechanical accuracy of their writing, thus, ensuring their fulfillment of the tasks. However, according to writers from the High group (B, C, H), the RW tasks provided some sort of writing samples so they had clear structures to follow and content to paraphrase when composing.

Extracting was a process occurred more often for the Low group than the High group during the GW tasks. A further examination of individual writer's composing processes (see Appendix B) revealed that two writers from the Low group (Writer I and F) did more extracting than others in the group. Compared to other writers, these writers had more experience reading and interpreting graphs. Writer I, a Health Care Management major, and Writer F, a Physical Therapy major, stated that lots of their academic coursework involved analyzing graphs and converting data into graphs in their interviews. These writers found their experience had helped them determine what to select for writing.
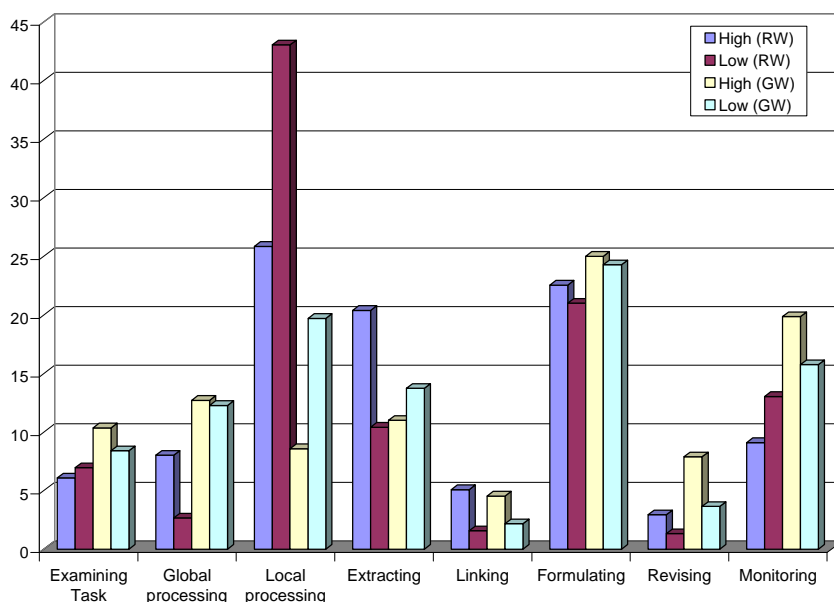

Figure 3 Percentages of composing processes of two groups of writers

V Conclusions

The study explored test-taking strategies that Taiwanese writers used on a RW and GW task for the purpose of test validation. The study also examined how writers' strategy use affect their performance on both test tasks. A SEM approach, think-aloud protocols, and interviews were used in this endeavor. The findings showed that the RW and the GW tasks engaged EFL writers in multiple strategies described in the literature of integrated writing. In other words, writers in the study were likely to draw on their source comprehension, interpretation, and language resources to respond to the task. Moreover, the use of these strategies generally facilitates test performance. Similarly, as indicated in the verbal protocols, writers engaged in several problem-solving and discourse-synthesizing approaches to academic writing reported in previous literature of source-based writing (Bridges, 2010; Hirvela, 2004; Ruiz-Funes, 1999; Spivey, 1997). Thus the study provides evidence to support the construct validity of the RW and GW tasks. In addition, contrary to the purely linear (Rohman, 1965) and recursive view of writing (Flower & Hayes, 1981; Witte, 1985), the protocols revealed both linear and iterative nature of composing from sources. It appeared that writers' L2 proficiency and composing purpose may have contributed to the recursiveness of the process. Writers with higher L2 proficiency interacted with source texts more actively, and thus they demonstrated a more flexible and dynamic patterns of process. Less proficient L2 writers, however, tended to follow a more linear progression in the sequence of composing.

The study also revealed that the GW task tapped global-level graph comprehension and challenged the writers to transform their interpretations of the graphs into a meaningful text of their own. On the other hand, the RW task minimally required comprehension of the local-level information. In general, the RW tasks required more effort into preparation for writing while the GW tasks required more effort toward actual composing. The findings provide support that these tasks may be measuring different aspects of source-based writing ability.

The study also revealed some differences between the High and Low group. The High group showed a tendency to use a wider range of processes more frequently than the Low group, a finding that can be linked to research on cognitive operations during source-based writing (Connor & Kramer, 1995; Esmaeili, 2002; Plakans, 2009; Yang & Shi, 2003). These results suggested that the tasks generated different processes in proficient and less proficient writers. Because the written products reflected the processes deployed during the tasks, writers' scores can be seen to reflect their ability to use processes and that the tasks may have helped differentiated between skilled and less skilled writers. However, caution must be taken due to the potential influence of graph familiarity on writers' processes and performance as indicated in a number of studies on graph-based assessment tasks (Katz, Xi, Kim, & Cheng, 2004; Xi, 2010).

Several major limitations of this study should be noted. First, the study only focused on two source-based writing tasks specifically developed for the study. Task and topic effects may occur given that there are many variants of academic writing. In addition, because this was essentially an inventory study, only a small number of possible strategy items were used. No doubt, there could have been many other strategies writers may use to approach the tasks. Future studies focusing on more qualitative analyses such as eye-tracking data may offer more insights into writers' mental operations in responding to source-based writing tasks.

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國科會補助專題研究計畫項下出席國際學術會議心得報告

計畫編號	NSC　99－2410－H－040－001		
計畫名稱	整合性寫作測驗題型及寫作策略對於英文寫作表現之析論 An analysis of the relationship of integrated writing test tasks and strategy use to EFL integrated writing test performance		
出國人員 姓名	楊蕙君	服務機構 及職稱	中山醫學大學應用外國語言學系 助理教授
會議時間	2011 年 1 月 3 日至 2011 年 1 月 7 日	會議地點	Honolulu, Hawaii, U.S.A.
會議名稱	（中文）夏威夷國際教育研討會 （英文）The Ninth Annual Hawaii International Conference on Education		
發表論文 題目	（中文）閱讀寫作測驗中的策略使用 （英文）*Linking Reading to Writing: Strategy Use in Reading-to-Write Test Tasks* （中文）從構思到寫作之歷程研究 （英文）*Moving from Planning to Writing*		

一、參加會議經過

The Ninth Annual Hawaii International Conference on Education (HICE) took place at the Hilton Hawaiian Village in Honolulu, Hawaii. The 2011 HICE provides researchers with cross-disciplinary interests an access to meet and interact with scholars from various disciplines and cooperation opportunities with these academics and professionals. The conference was held between January 4th to January 7th. I flew from Taipei to Honolulu and arrived early at 7am in the morning on January 4th. In the conference, I presented two papers and was invited to be a session chair for an ESL/TESL session on January 5th. In addition to my presentations, I also attended several sessions on topics related to literacy education, language assessment, computer-assisted language learning, and language learning and teaching.

On the first day of the conference, I attended a workshop on washback effects of testing on curriculum and instruction presented by Professors Melinda Cowart and Gina Anderson from Texas Woman's University. The workshop provided explicit explanation about how high-stakes testing may have phenomenal impacts on stakeholders including English learners, teachers, and school administrators. They also provided suggestions regarding how the program and assessments can be tailored to accommodate English learners' needs and promote their language achievements. The workshop is closely related to my current research project and useful for me to explore the issue of assessment from the perspective of their impacts on learning and teaching of English in Taiwan.

On January 5th, I attended a keynote speech entitled "Hawaii – The Legacy of Literacy" given by one of the very respected Dr. Puakea Nogelmeier from the University of Hawaii and Kau'i Sai-Dudoit from the

Hawaiian Newspaper Resource. They first described the variety and history of literacy practices in Hawaii and moved on to discuss the multicultural interactions among various language groups. Then they talked about how the long-lasting traditions of oral systems and ever-changing technology have intertwined into a powerful force driving the interplay of orality, literacy, and education in the modern society today. The speech inspired me to think about the role of new literacies in an EFL classroom in Taiwan and the possible incorporation of communication technologies into classrooms to promote and mediate the participation and interactions of students. On the same day, I also listened to Cindy Y. Chung from the University of Oregon presenting her work on the development of authentic listening materials for college students in Taiwan. She talked about using adapted authentic listening materials in listening courses and provided a list of activities that promoted the development of college students' English listening ability. Following these sessions, I listened to a presentation on how Japanese learners approach academic papers given by Professors Yuko Hijikata, Yasuo Nakatani, and Makoto Shimizu from Tokyo University of Science. They discussed many strategies learners used during reading journal articles in the filed of business management and made pedagogical suggestions toward EFL reading pedagogy.

On the third day of the HICE, I listened to several fascinating presentations on topics regarding computer-assisted language learning. Two researchers, Michael Barbour and Kelly Unger from Wayne State University, talked about a creation of online learning environments and how they may be applied to reading comprehension assessments in classroom settings. Chery Takkunen examined the application of Twitter for pedagogical purposes. In the afternoon, I went to a workshop delivered by Professors Jeanne Bauwens from the University of Hawaii at Manoa and Suzanne Robinson from the University of Kansas. These researchers demonstrated different approaches for improving writing proficiency of students across disciplines. This workshop was relevant to my NSC project and has provided some insights into college writing instructions.

On the last day of the HICE (January 7th), I attended a workshop entitled "Does Assessment Have to be Painful? Fun Yet Challenging Ways to Assess Group Activities" delivered by Ruth Grady, Ingrid Gouldsborough, Tracey Speake, and Elizabeth Sheader from the University of Manchester. They discussed several activity-based assessment procedures that may be incorporated in language classes. The workshop provided innovative approaches that enable teachers to better understand students' current levels and foster students' motivation to improve their ability. This work is closely related to one of my students' thesis study advised by me.

二、與會心得

The presentations I attended allowed me to keep updated with the current research developments in the field of applied linguistics and had inspired me to explore various interdisciplinary areas for my future research. I am also fortunate to have the opportunities to talk to several scholars from different disciplines and countries during my sessions. They had provided me some useful comments and suggestions for my study and offered ideas on cross-cultural and interdisciplinary projects. Although I have attended numerous conferences in the past such as AAAL, LTRC, and TexTESOL, to name a few, the experience of attending the HICE was very stimulating and informative because I got to listen to voices from different groups of people and reexamine my research from various perspectives. I learned a great deal from the HICE and I felt refreshed with new ideas for more and better research when I came back. This experience is exhilarating and extremely rewarding.

三、考察參觀活動（無是項活動者略）

N/A

四、建議

The conference was well-organized, with relevant and a variety of topics as well as efficient format combined with presentations, poster sessions, and workshops.

五、攜回資料名稱及內容

2011 HICE conference program and proceedings

六、其他

N/A

三、考察參觀活動（無是項活動者略）

N/A

四、建議

國科會補助計畫衍生研發成果推廣資料表

國科會補助計畫	計畫名稱: 整合性寫作測驗題型及寫作策略對於英文寫作表現之析論
	計畫主持人: 楊蕙君
	計畫編號: 99-2410-H-040-001-　　　　　學門領域: 英語能力研究

<div align="center">無研發成果推廣資料</div>

計畫名稱: 整合性寫作測驗題型及寫作策略對於英文寫作表現之析論

計畫主持人: 楊蕙君

計畫編號: 99-2410-H-040-001-　　　　　學門領域: 英語能力研究

99 年度專題研究計畫研究成果彙整表

計畫主持人：楊蕙君　　計畫編號：99-2410-H-040-001-

計畫名稱：整合性寫作測驗題型及寫作策略對於英文寫作表現之析論

成果項目			量化			單位	備註（質化說明：如數個計畫共同成果、成果列為該期刊之封面故事...等）
			實際已達成數（被接受或已發表）	預期總達成數(含實際已達成數)	本計畫實際貢獻百分比		
國內	論文著作	期刊論文	0	0	100%	篇	
		研究報告/技術報告	0	0	100%		
		研討會論文	0	0	100%		
		專書	0	0	100%		
	專利	申請中件數	0	0	100%	件	
		已獲得件數	0	0	100%		
	技術移轉	件數	0	0	100%	件	
		權利金	0	0	100%	千元	
	參與計畫人力（本國籍）	碩士生	0	0	100%	人次	
		博士生	0	0	100%		
		博士後研究員	0	0	100%		
		專任助理	0	0	100%		
國外	論文著作	期刊論文	0	2	100%	篇	目前兩篇期刊文章已撰寫完畢，已投稿至 TESOL Quarterly 和 English for Specific Purposes，正在審稿中。
		研究報告/技術報告	0	0	100%		
		研討會論文	0	0	100%		
		專書	0	0	100%	章/本	
	專利	申請中件數	0	0	100%	件	
		已獲得件數	0	0	100%		
	技術移轉	件數	0	0	100%	件	
		權利金	0	0	100%	千元	
	參與計畫人力（外國籍）	碩士生	0	0	100%	人次	
		博士生	0	0	100%		
		博士後研究員	0	0	100%		
		專任助理	0	0	100%		

	其他成果 (無法以量化表達之成果如辦理學術活動、獲得獎項、重要國際合作、研究成果國際影響力及其他協助產業技術發展之具體效益事項等，請以文字敘述填列。)	部分內容已於 2011 Hawaii International Conference on Education 國際研討會上發表 另外以下兩篇手稿目前已送出，正在審核中 •ang, H.-C. (under review). Exploring composing processes in source-based writing test tasks. Submitted to TESOL Quarterly (SSCI Journal). •ang, H.-C. (under review). Modeling the relationships between test-taking strategies and test performance in a graph-writing test task. Submitted to English for Specific Purposes (SSCI Journal).

	成果項目	量化	名稱或內容性質簡述
科教處計畫加填項目	測驗工具(含質性與量性)	0	
	課程/模組	0	
	電腦及網路系統或工具	0	
	教材	0	
	舉辦之活動/競賽	0	
	研討會/工作坊	0	
	電子報、網站	0	
	計畫成果推廣之參與（閱聽）人數	0	

國科會補助專題研究計畫成果報告自評表

請就研究內容與原計畫相符程度、達成預期目標情況、研究成果之學術或應用價值（簡要敘述成果所代表之意義、價值、影響或進一步發展之可能性）、是否適合在學術期刊發表或申請專利、主要發現或其他有關價值等，作一綜合評估。

1. 請就研究內容與原計畫相符程度、達成預期目標情況作一綜合評估 ■達成目標 □未達成目標（請說明，以 100 字為限） 　　　□實驗失敗 　　　□因故實驗中斷 　　　□其他原因 　說明：
2. 研究成果在學術期刊發表或申請專利等情形： 論文：□已發表 ■未發表之文稿 □撰寫中 □無 專利：□已獲得 □申請中 ■無 技轉：□已技轉 □洽談中 ■無 其他：（以 100 字為限）
3. 請依學術成就、技術創新、社會影響等方面，評估研究成果之學術或應用價值（簡要敘述成果所代表之意義、價值、影響或進一步發展之可能性）（以 500 字為限） 研究成果具有各項學術及應用價值。過去寫作測試著重於一般傳統式單一議題之寫作模式，此研究探討整合式寫作中寫作策略的使用及其對寫作結果之影響。研究結果將揭開整合式寫作之建構效度，因而對於測試題型的設計，以及學生成績的評估及解讀有進一步的瞭解。未來將會對於整合式寫作題型對不同向度之寫作表現作更深入的瞭解，以期運用於學術寫作之測驗及教學。