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動機與策略對英文論文摘要之解釋性

The Role of Identity-based Motivation and
Self-regulatory Strategies in Explaining
Research-Article Abstract Writing Ability
with L2 Literacy as a Covariate

指導教授：程玉秀 博士、林世華 博士

Advisors: Dr. Yuh-show Cheng and Dr. Sieh-hwa Lin

研究生：林明佳

Student: Ming-chia Lin

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中文摘要

本研究旨在探討認同為本的寫作動機、自我調控寫作策略、及英語讀寫能力對論文摘要寫作能力之解釋性。為達成此研究目標，本研究轉換四個構念成為四項工具，以便建構並考驗一個動機化摘要寫作模型。其中英語讀寫能力測驗採用全民英檢高級，其餘三種工具則另行發展。

在前導研究中，對分佈於 5 所大學的 255 位博士生（140 位主修教育，115 位主修商業）實施動機量表與策略量表。兩份量表的效度獲得初步支持。摘要寫作評量則發展如下：兩個評分表歷經一連串的專家審查，摘要寫作任務則對五位應用語言所的研究生施測，其可行性獲得初步支持。

在正式研究中，資料蒐集歷經 130 分鐘，依序實施四種評量工具：英語讀寫測驗（55 分鐘）、論文摘要寫作任務（60 分鐘）、及動機量表與策略量表（15 分鐘）。受試者為自願的研究生，來自臺灣 15 所大學的應用語言學研究所（包含碩士生與博士生，共計 185 位）。以上正式研究的資料蒐集在兩個月之內完成。資料分析採用結構方程模式的兩步驟取向。

測量模型的結果支持實證資料與動機化摘要寫作模型的適配性，顯示四項工具能適切回應四個構念。結構模型的結果亦支持實證資料與動機化摘要寫作模型的適配性。英語讀寫能力被證實是一個有作用的共變數($\beta=.53$)。當控制讀寫能力與策略時，動機對摘要寫作能力有直接效果($\beta=.19$)。當控制讀寫能力與動機時，策略對摘要寫作能力無直接效果。動機經由策略對寫作能力無間接效果。另外，也發現動機對策略有直接效果($\beta=.46$)。

理論上，動機對摘要寫作能力的直接效果支持以下四個理論的整合：教育心理學學門之中認同為本的動機理論（Oyserman & Destin, 2010）與期望價值理論（Eccles, 2009），外語學習學門之中社會教育理論（Gardner, 2007）與文類理論（Swales, 1990）。本研究之認同為本的寫作動機，能有效捕捉上述四個理論之中，共同含有的認同動機構念。若未來的研究者操作此認同寫作動機構念，則近似於同時操作這些理論的共同構念，因而可望有效地精簡其研究設計。又此四個理論的整合，讓未來的研究者能以統整的方式來解讀先前研究對這四個理論的發現，而讓這種認同動機在外語學習上有較為普遍的應用。教學上，本研究的發現指出，欲培養學生英文論文摘要的寫作能力，可先提升其一般的英語讀寫能力；又擁有較高動機的學生，通常寫作能力也比較好。因此，英文論文的寫作教師，除了教導寫作技巧之外，亦可教導學生如何體悟、激勵、與維持自身之認同為本的寫作動機，才能有效提升其英文論文摘要的寫作能力。然而，使用較多寫作策略的學生，卻未必有較好的寫作能力；因此，使用策略的效益，有待進一步的研究。

關鍵字：英語讀寫能力、認同為本的寫作動機、自我調控的寫作策略、英文論文摘要寫作能力、動機化摘要寫作模型、結構方程模式

ABSTRACT

The aim of the study was to investigate the role of identity-based writing motivation and use of self-regulatory writing strategies in explaining research-article (RA) abstract writing ability with L2 literacy as a covariate. To achieve this aim, the study constructed and tested a motivated abstract-writing model (MAW model) by translating the above four constructs into four measures. L2 literacy test was adopted from the General English Proficiency Test-advanced. The remaining three measures were developed here, including identity-based writing motivation inventory (IWMI), self-regulatory writing strategy inventory (SWSI), and research abstract performance assessment (RAPA) with an RA-abstract writing task and two rating scales.

In the pilot study, IWMI and SWSI were administered to a total of 255 L2 doctoral students majoring in education (n=140) and business (n=115) across five universities in Taiwan. IWMI and SWSI were supported for psychometric properties. RAPA was developed by expert-review on the two rating scales and by pilot-test of the RA-abstract writing on 5 graduate students in applied linguistics to ensure its feasibility. In the formal study, data were collected from a 130-minute procedure in which the four measures were administered in sequence: L2 literacy test (55 minutes), RA-abstract writing task (60 minutes), and IWMI and SWSI (15 minutes). The participants were voluntary L2 graduate students (master's and doctoral students) majoring in applied linguistics across 15 universities in Taiwan (n=185); they were recruited over two months. Data were analyzed by the two-step approach of SEM.

In measurement model, results supported the goodness-of-fit between the collected data and the MAW model, suggesting the four measures were generally valid in manifesting the four constructs. In structural model, results also supported the goodness-of-fit between the collected data and the MAW model. L2 literacy being a

strong covariate was supported ($\beta=.53$). With L2 literacy and strategy controlled, direct effect of identity-based writing motivation on RA-abstract writing ability was supported ($\beta=.19$). With L2 literacy and motivation controlled, direct effect of self-regulatory writing strategy on writing ability was not supported. Indirect effect of motivation on writing ability via strategy was not supported. Additionally, direct effect of motivation on strategy was supported ($\beta= .46$).

Theoretically, the direct effect of identity-based writing motivation supports a synthesis of the identity-based motivation theory (Oyserman & Destin, 2010) and the expectancy-value theory (Eccles, 2009) in educational psychology, as well as the socio-educational theory (Gardner, 2007) and the genre theory (Swales, 1990) in L2 learning. Specifically, the identity-based writing motivation can capture the common construct of collective identity among the aforementioned theories. Adopting this writing motivation, researchers may reduce the complexity of their research design. Moreover, it allows future studies to synthesize findings on these theories, enabling a wider generalization of the identity-based writing motivation in L2 learning.

Pedagogically, the findings indicate that when aiming to cultivate L2 graduate students' English RA-abstract writing ability, instructors first need to enhance students' L2 literacy. Second, students with higher motivation were found to write better. Instructors should not only address skill for RA writing, but teach students how to recognize, stimulate, and sustain their identity-based writing motivation so as to effectively enhance their RA-abstract writing ability. However, students who use more writing strategies do not necessarily lead to a better writing ability. The effectiveness of strategy use requires future studies.

Key words: L2 literacy, identity-based writing motivation, self-regulatory writing strategies, research-article abstract writing ability, the motivated abstract-writing model (the MAW model), and the structural equation modeling (the SEM)

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Table of Contents

| | |
|--|------|
| List of Tables..... | viii |
| List of Figures..... | ix |
| CHAPTER ONE INTRODUCTION..... | 1 |
| Introduction..... | 1 |
| Background..... | 5 |
| Rationale..... | 6 |
| Definitions of Terms..... | 11 |
| L2 Literacy..... | 11 |
| Identity-Based Writing Motivation..... | 12 |
| Connectedness Value..... | 13 |
| Self-regulatory Writing Strategies..... | 13 |
| Genre Theory of Rhetorical Moves..... | 14 |
| Ability to Write Research Article Abstracts..... | 15 |
| Purposes of the Study..... | 15 |
| Significance of the Study..... | 18 |
| CHAPTER TWO LITERATURE REVIEW..... | 20 |
| Genre theory of Research Articles (RAs)..... | 20 |
| General Background of Genre Analysis of RAs..... | 20 |
| Genre Analysis of Research Article Abstracts..... | 24 |
| L2 Motivation, Self-regulatory Strategies, Language Proficiency, and RA-abstract Writing Ability..... | 29 |
| General Background of L2 Learning Motivation..... | 29 |
| Relating Identity-based Writing Motivation to Their RA-abstract Writing Ability | 31 |
| Relating Self-regulatory Writing Strategies to Identity-based Writing Motivation and RA-abstract Writing Ability..... | 47 |
| Relating L2 literacy to Identity-based Writing Motivation, Self-regulatory Writing Strategies, and RA-abstract Writing Ability..... | 65 |
| CHAPTER THREE METHOD..... | 73 |
| The Proposed Model..... | 73 |
| Research Procedure..... | 74 |
| Participants..... | 80 |
| The Pilot Study..... | 80 |
| The Formal Study..... | 83 |
| Measures..... | 91 |
| Identity-based Writing Motivation Inventory (IWMI)..... | 92 |
| Self-regulatory Writing Strategy Inventory (SWSI)..... | 107 |

| | |
|---|-----|
| The L2 literacy Test | 124 |
| Research Abstract Performance Assessment (RAPA) | 129 |
| The Structural Equation Modeling Approach | 145 |
| CHAPTER FOUR RESULTS | 148 |
| Descriptive Statistics | 148 |
| The Measurement Model | 152 |
| Goodness of Fit Indices | 152 |
| Correlations Between the Latent Variables | 157 |
| Construct Validity Testing | 159 |
| Convergent Validity | 160 |
| Discriminant Validity | 163 |
| The Structural Model | 165 |
| Goodness of Fit Indices | 166 |
| Factor Loadings of the Structural Model | 166 |
| Regression Coefficients of the Structural Model: Hypotheses Testing | 169 |
| CHAPTER FIVE DISCUSSION AND CONCLUSION | 172 |
| Overview of the Study | 172 |
| Discussion | 174 |
| The Measures Developed in the Study | 174 |
| Findings on the Testing of Three Hypotheses | 181 |
| Implications | 208 |
| Limitations and Suggestions | 215 |
| Conclusion | 218 |
| References | 219 |
| Appendices | 236 |

List of Tables

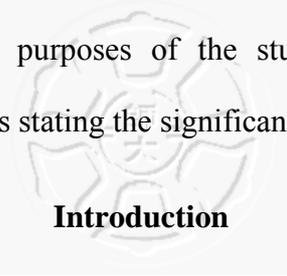
| | |
|--|-----|
| Table 1 Research Procedure | 75 |
| Table 2 Demographics of Doctoral Students of Education Majors and Business Majors in the Pilot Study..... | 83 |
| Table 3 Distribution of the Participants' Universities in the Formal Study | 87 |
| Table 4 Demographics of the Participants in the Formal Study | 88 |
| Table 5 Items in the Identity-based Writing Motivation Inventory | 95 |
| Table 6 Descriptive Statistics for the Interest Value Subscale | 98 |
| Table 7 Descriptive Statistics for the Utility Value Subscale..... | 99 |
| Table 8 Descriptive Statistics for the Cost Subscale..... | 100 |
| Table 9 Descriptive Statistics for the Connectedness Value Subscale | 101 |
| Table 10 Descriptive Statistics for the Ability Self-concept Subscale..... | 102 |
| Table 11 Cronbach Alpha of the Five Subscales in IWMI..... | 103 |
| Table 12 Factor Loadings of the Items in the 5 Subscales of IWMI | 104 |
| Table 13 Correlations among the Five Latent Variables in IWMI..... | 106 |
| Table 14 Items in Self-regulatory Writing Strategy Inventory | 109 |
| Table 15 Descriptive Statistics of the Cognition Regulation Subscale..... | 114 |
| Table 16 Descriptive Statistics of the Motivation Regulation Subscale | 116 |
| Table 17 Descriptive Statistics of the Socio-Interactive Resources Regulation Subscale | 117 |
| Table 18 Cronbach Alpha of the 3 Subscales of SWSI..... | 118 |
| Table 19 Factor Loading of the Items in the 3 Subscales of SWSI | 119 |
| Table 20 Correlations among the Three Latent Variables in SWSI..... | 121 |
| Table 21 Goodness-of-fit Indices for Models without and with Error-covariances .. | 123 |
| Table 22 Scoring Rubric for the Essay Test in the GEPT-advanced..... | 127 |
| Table 23 Three Reviewers' Comments for Scale Revision..... | 136 |
| Table 24 Coding Scheme of Rhetorical Moves in Abstracts | 141 |
| Table 25 Summary of the Measures for the Proposed Model..... | 144 |
| Table 26 Cutoff Criteria of the Fit Indices Reported (according to Hair et al., 2010) | 147 |
| Table 27 Descriptive Statistics and Zero-order Correlations of the 12 Indicators in the Study | 151 |
| Table 28 Goodness-of-fit Indices for Models without and with Error-covariances .. | 155 |
| Table 29 Correlations Between the 4 Latent Variables | 158 |
| Table 30 The AVE and the Square of the Correlations Between the Latent Variables | 165 |
| Table 31 Fit Indices of the Structural Model | 166 |

List of Figures

| | |
|--|-----|
| Figure 1. The motivated abstract-writing model (the MAW model). | 17 |
| Figure 2. Simplified version of the Eccles et al. expectancy-value model of motivation. | 35 |
| Figure 1. The motivated abstract-writing model (the MAW model). | 74 |
| Figure 3. The measurement model of the MAW model in the completely standardized solution..... | 161 |
| Figure 4. The structural model of the MAW model in the completely standardized solution..... | 168 |
| Figure 5. The findings on the Motivated Abstract-Writing model..... | 173 |

CHAPTER ONE INTRODUCTION

This chapter begins with an introduction to the present study. Next, the chapter provides background and rationale for the study, and defines key terms used here. Finally, the chapter states the purposes of the study by proposing a motivated abstract-writing model, as well as stating the significance of the study.



Introduction

Motivation has been widely recognized as one of the key factors determining the process of foreign language (L2) learning. In particular, learning efforts L2 students make, the extent they sustain L2 learning and expect themselves to succeed, and the extent they envision competent L2 users as a desired future identity often shape L2 learning process and determine the degree of L2 attainment. Given the importance of motivation, a myriad of studies have been conducted over the past three decades to draw causal or interdependent links between motivation, learning engagement, and L2 attainment (Csizér & Dörnyei, 2005; Dörnyei, 2001, 2005, 2009; Gardner, 1985, 2007; MacIntyre, 1994, 2002; Masgoret & Gardner, 2003; Matthews, 2008; Mori, 2002; Mori & Gobel, 2006; Huang, 2007; Oxford & Shearin, 1994; Yashima, Zenuk-Nishide, & Shimizu, 2004)

While the previous literature of L2 motivation typically targets L2 learning for general purposes (Csizér & Dörnyei, 2005; Gardner, 1985), researchers have become increasingly interested in examining L2 learning for specific purposes (Matthews, 2008; Mori, 2002; Mori & Gobel, 2006). That is, L2 learning may be defined as a specific task that requires L2 students to fulfill particular communicative purposes in academic settings; the task achievement is thus relatively specified. A specific task enables L2 researchers to closely examine the degree to which contexts (e.g., local academic

settings and global L2-cultural settings) exert effects on L2 motivation. This perspective of context-cued motivation rests on an assumption that context shapes identity-based L2 motivation and subsequent choices of motivated L2 learning. That is, L2 learners are inherently situated in contexts. In the contexts, L2 learners formulate their future personal and social identities as competent L2 users and to perceive choices as available for L2 learning, which in turn affects their L2 learning motivation. Take a learning task of English research-article (RA) writing for example. A future identity as a legitimate researcher who can write English RAs acceptable to their chosen fields may become salient and relevant to L2 graduate students. In this case, they will not only launch subsequent actions of motivated L2 learning (e.g., use of self-regulatory learning strategies to manage learning), but protect their learning actions, until the future identity as a legitimate researcher in their fields is relatively realized.

A similar interest in how context affects motivated L2 learning has emerged in genre research of L2 students' RA writing. For instance, genre research has highlighted the need to explore how L2 graduate students' RA writing is shaped by context defined as immediate learning context at the local level, or relative distal discourse community (imagined audience) at the global level. Targeting this context effect, a growing body of genre studies has documented the context-based learning process in which L2 graduate students seek their future identities in a chosen disciplinary community by striving to write RAs acceptable to the community (Chang & Kanno, 2010; Flowerdew, 2000; Hancioglu, 2009; Huang, 2010; Hsieh & Liou, 2008; Hung, 2010; Lau, 2004; Pho, 2008; Salager-Meyer, 1992). To become a legitimate researcher writing discipline-acceptable RAs, L2 graduate students usually need to launch subsequent motivated learning actions to apprehend RA-writing norms and to acquire the mechanisms used for negotiation in the community. To explore the learning process, the genre research tends to employ qualitative inquiries that track idiosyncratic change in

L2 motivation to form a researcher identity in given fields (Chang & Kanno, 2010; Cheng 2007; Flowerdew, 2000; Huang, 2010), rather than quantitative inquiries that often aim to reveal an overall picture of motivated L2 learning to write RAs. However, if the overall picture can be revealed, more light may be shed on L2 graduate students' motivation profile (e.g., willingness and ability to write RAs acceptable to a chosen disciplinary community), cognitive factors related to academic writing (e.g., English literacy, and use of self-regulatory writing strategies), and achievement of RA writing. Investigating this motivated L2 learning trajectory of RA writing from a quantitative perspective may contribute to the advancement of L2 learning theory in general and L2 RA-writing theory in particular, in addition to pedagogical implications.

As the importance of context has been well-recognized in the two different but related subfields in L2 learning research, the present study attempted to go a step further by initiating a dialogue between L2 motivation research and genre research targeting English for academic purposes. The dialogue seeks to define L2 motivation by identity-based motivation theory and expectancy-value theory, and to contextualize motivated L2 learning processes in a specific task: L2 graduate students' learning to write English RAs. Specifically, the dialogue views this motivated L2 learning process as an identity-development process nested in a disciplinary community. In this identity-development process, L2 graduate students will become motivated to learn English RA writing if they are willing to and capable of pursuing a future identity as a non-native-English-speaking researcher (NNES-researcher identity) who can write RAs acceptable to their chosen fields. By defining L2 motivation from the identity-development perspective, I attempted to investigate the personal and contextual influence on L2 motivated RA writing. One aspect of the personal influence investigated here is: individuals' English literacy, which partially reflects their past learning experience and can serve as a motivational covariate. The contextual influence

examined in this study includes motivation (i.e., the level of their identity-based writing motivation), the choices that L2 students take in the learning process, and the norms they use to evaluate their learning outcomes. Specifically, the choices in the learning process in question will be observed from the degree to which L2 graduate students use self-regulatory RA-writing strategies to write better. The norms they use to evaluate learning outcomes will be observed from the RA rhetorical features they use to conform to the writing conventions of a given disciplinary community.

In addition to the personal and contextual influences mentioned above, English RA-writing has been well-recognized as a complex task because it involves varying sections that perform different rhetorical functions (Chang & Kanno, 2010; Flowerdew, 2000; Hancioglu, 2009; Huang, 2010; Hsieh & Liou, 2008; Hung, 2010; Lau, 2004; Pho, 2008; Salager-Meyer, 1992; Swales & Feak, 2004; 2009; 2010). For instance, abstracts outline the essence and significance of the studies (Hsieh & Liou, 2008; Lau, 2004; Liou, Yang & Chang, 2011; Pho, 2008; Salager-Meyer, 1992; Swales & Feak, 2004; 2009; 2010); introductions provide theoretical background and literature framework for the studies (Bhatia, 1993, 2004; Cheng, 2007; Flowerdew, 2000); and methods describe research instruments and procedure (Flowerdew, 1999b; 2000). Among these varying sections, abstracts, with the function of outlining the study essence, seem a feasible section for a preliminary evaluation of L2 graduate students' RA writing ability. Therefore, the present study used RA-abstract as the target section to investigate L2 graduate students' RA writing ability.

In sum, the present study used RA-abstract as the target section to investigate the influence of identity-based writing motivation, and use of self-regulatory writing strategies on RA-abstract writing of L2 graduate students with a covariate of L2 literacy. An attempt was also made to construct and test a motivated abstract-writing model (the MAW model).

Background

As a non-native-English-speaking graduate student in the field of learning English as a second or foreign language (L2), I have experienced considerable difficulties in learning to write English research articles. With a concrete goal to become a relatively competent RA writer, I have devoted much time to improving my English writing ability and acquiring knowledge of RA genre. By observing my classmates' and my own learning experiences, I found that the knowledge of the RA genre may include an understanding of rhetorical purposes, lexico-grammatical patterns, and negotiation norms typically practiced in a chosen disciplinary community. As acquisition of this knowledge seems complex in nature, the learning process often spans a lengthy period.

It thus becomes interesting to unveil the underlying factors that may sustain L2 graduate students' learning engagement, and propel them to attain the relative success of producing RAs acceptable to their chosen fields. These factors may be numerous, but a handful of key factors have drawn L2 researchers' attention due to the great impact that they bring to students' psychological vigor, cognitive engagement, and behavioral attainment while learning English RA writing. Some of these key factors are L2 graduate students' English proficiency (Flowerdew, 1999a, 2000; Huang, 2010), motivation for English RA writing (Cheng, 2007; Huang, 2010), use of strategies when writing English RAs (Flowerdew, 2000; Swales & Feak, 2009, 2010), and development of a researcher identity as a non-native-English writer (Chang & Kanno, 2010; Huang, 2010). Although these factors are identified as critical to L2 RA writing ability development by various L2 researchers, little empirical data to date have been provided on how these factors interact with each other and with L2 RA writing ability. I attempted to bridge this gap by exploring the role these factors play in explaining L2 graduate students' RA writing ability.

Rationale

Two branches of research provide theoretical foundations for this study. The first branch is genre-based research in which an RA is defined as acceptable when the RA conforms to the communicative norms of a disciplinary community. In genre-based research, whether and how an RA conforms to the norms of a disciplinary community can be assessed by analyzing the use of global rhetorical moves and local lexico-grammatical patterns (Swales, 1990; Swales & Feak, 2004, 2009, 2010). The second branch is motivation research. Specifically, studies of learning motivation in general and L2 motivation in particular are reviewed in order to locate a feasible framework for motivated L2 learning of RA writing.

L2 motivation covers a broad range of concepts and beliefs, including interest in language norms (Gardner, 1985, 2007), willingness to interact with native speakers (Gardner, 1985, 2007), effort of learning engagement (Gardner, 1985, 2007), value judgment for learning (Mori, 2002; Tseng & Schmitt, 2008), expectancy for learning achievement (Mori, 2002; Tseng & Schmitt, 2008), and willingness to gain a future identity as being competent of learning (Dörnyei, 2005, 2009). Some of these concepts and beliefs, particularly the last three beliefs, are not unique to L2 learning and have been extensively discussed in learning of varying subjects. Among these three, two are generated from expectancy-value theory and recognized as a major determinant of learning achievement; that is, learners' subjective values and expectations assigned to learning achievement (Eccles, 2009; Eccles & Wigfield, 1995, 2002; Matthews, 2008; Mori, 2002; Mori & Gobel, 2006). The last one concerns one's belief about the identities that are defined as having a particular competence. This belief may stimulate learners to launch learning (Oyserman, Terry, & Bybee, 2002), once they perceive saliency and relevance to pursue these identities, which are largely cued by particular

contexts. Because learners' intention to realize possible identities are likely to initiate and sustain the subsequent motivated learning process, this process is termed as "the identity-based motivation process" by Oyserman et al. (2002). Similarly, Eccles (2009) incorporated this identity-based motivation process into her expectancy-value theory. By doing so, she argued that the desired identities function as a motivational latent variable observable from two beliefs, individuals' subjective values for achievement-related tasks and their expectancy for task success. These motivational beliefs will affect individuals' subsequent engagement in pursuing achievement-related tasks, and their attainment at task success through a motivated process to develop identities they desire (Eccles, 2009). Following this vein of thinking, I coined a term "identity-based writing motivation" to describe an identity-development process in which EFL graduate students engage to gain an identity as a legitimate researcher who could write English RAs acceptable to their chosen fields. Moreover, I assumed that this motivated identity-development process could be observed from L2 graduate students' subjective values of RA writing and expectancy for writing success, as well as from their subsequent engagement in learning with self-regulatory writing strategies.

On the other hand, some of the motivational beliefs are unique to L2 learning. One of the most well-known beliefs of this kind is integrativeness in Gardner's (1985) socio-educational model. Integrativeness refers to learners' willingness to acculturate into a target-language speaking community, and may determine whether L2 learners can achieve the ultimate level of L2 learning attainment (Gardner, 1985, 2007). Integrativeness may also serve as an antecedent of L2 learners' attitudes towards L2 learning tasks (Dörnyei, 2002; Gardner, 2007). However, integrativeness seems to be defined in a relatively broad sense because "target-language speaking community" is not specified. This broad definition makes it difficult to operationalize this construct despite its great value in L2 motivation research.

To address this problem, the present study proposes translating integrativeness into a construct of connectedness value by specifying the target-language speaking community according to the learning task. Specifically, connectedness value is defined as L2 graduate students' subjective values for socializing into the target disciplinary communities where they intend to publish their RAs. Based upon the expectancy-value theory, connectedness value is conceptualized as reflecting L2 graduate students' subjective appraisals of reasons and benefits to acquire a social identity as a legitimate researcher identity in an L2-speaking disciplinary community where their RAs circulate. Connectedness value is also assumed to demonstrate a particular kind of attainment value related to L2 graduate students' self-attainment in successfully socializing into their disciplinary communities. Connectedness value is thus viewed as a key construct underlying L2 graduate students' motivation to write English RAs in this study.

As explained above, the present study synthesized key motivational constructs from previous research and defines L2 motivation as individuals' value and expectancy of L2 achievement held against the backdrop of their willingness to pursue a future identity as competent L2 users. This motivation is hypothesized to be predictive of English RA-writing ability based on two qualitative studies. Cheng (2007) documented a motivated RA writing process in which a Chinese-speaking doctoral student in electrical engineering showed not only his motivation to learn RA writing by genre-based practices but how his motivation pushed him to make progress in writing introductions of RAs. Curry and Lilis (2004) reported a similar motivated process of learning to write RAs as follows. Attempting to earn a promotion opportunity, an NNES scholar in Hungary (a psychology professor) became motivated to improve his English RA writing ability. Engaged in a motivated but lengthy learning process, he succeeded in publishing his English RAs in some international journals (Curry & Lilis, 2004). Findings from these two qualitative studies provide some support for the direct effect of

identity-based writing motivation on NNES researchers' English RA writing ability.

A subsequent step is then to decide key motivational covariates or consequences that may affect the direct effect of L2 motivation on L2 attainment. Based on previous research (e.g., Pintrich, 2004), motivated engagement in learning is considered to be of great importance because it reflects how individuals devote their behavioral and mental efforts to approaching L2 achievement-related tasks. Motivated engagement is often operationalized as motivated use of learning strategies to approach learning more effectively, as shown either in educational psychology research (Bruinsma, 2004; Pintrich & De Groot, 1990; Pintrich & Zusho, 2002; Pokay & Blumenfeld, 1990; Swalander & Taube, 2007; Vanderstoep & Pintrich, 2003; Wolters, 1998, 1999), or in L2 learning research (Liem, Lau, & Nie, 2008; Tseng & Schmitt, 2008). In this vein of thinking, if L2 graduate students are motivated to effectively use RA-abstract writing strategies, they may reach higher level of RA-abstract writing. Accordingly, it is hypothesized that L2 graduate students' use of self-regulatory RA-abstract writing strategies will have a direct effect on RA-abstract writing ability. It is also hypothesized that the use of writing strategies will mediate the effect of identity-based writing motivation on writing ability.

As for motivational covariates, previous motivation studies in educational psychology and in L2 learning have identified a number of key factors, such as cultural and gender systems (Eccles et al., 1983; Eccles, 2009), societal behaviors and beliefs (Jones, 2008), and past learning experiences (Jones, 2008; Liem et al., 2008; Pokay & Bluenfeld, 1990; Schwinger, Steinmayr, & Spinath, 2009, 2012). Among these covariates, past learning experiences have been identified as a consistent covariate for learning achievement alongside learners' motivational beliefs (expectancy and value) (Jones, 2008; Liem et al., 2008; Pokay & Bluenfeld, 1990; Schwinger et al., 2009). Past learning experiences are often operationalized by individuals' ability or aptitude

essential for a given learning task (e.g., prior performance or knowledge). Since the present study targeted the task of RA-abstract writing that is often deemed demanding and specific, it seems reasonable to operationalize prior performance at a specific level, rather than at a general level, such as overall English proficiency. Thus, L2 literacy was adopted in the study to represent prior performance and served as a covariate of explaining ability to write English RA-abstracts in particular.

Despite this specific operationalization on L2 literacy as a covariate here, it is not uncommon for previous studies to discuss such prior performance at a rather general level (i.e., English/L2 proficiency). For instance, two case studies (Flowerdew, 2000) addressed NNES researcher's experiences in submitting English journal articles to international journals, showing that English proficiency may affect the outcomes. Specifically in the two case studies, a Cantonese-speaking professor in Hong Kong (Curry & Lilis, 2004; Flowerdew, 2000) and a Hungarian-speaking professor of psychology in Hungary (Curry & Lilis, 2004) reported that their limited English proficiency apparently made their writing of English journal articles less qualified as a publishable work according to the harsh criticisms from reviewers and editors of high-status international journals (Flowerdew, 2000).

Other qualitative studies (e.g., Cheung, 2010a, 2010b; Okamura, 2006) have also provided support for the finding that limited English proficiency hinders the development of NNES-researchers' English RA writing ability and impedes their success in publishing English RAs in high-status international studies. Note that limited English proficiency was defined as grammar, language usage, and writing style in Cheung's (2010a) study of 6 doctoral students in applied linguistics in Hong Kong, and defined as lack of vocabulary to clearly report research results and to state claims in Okamura's (2006) study of 2 Japanese-speaking professors in biology. Findings from these qualitative studies reveal the direct effect of English proficiency/literacy on

NNES researchers' English RA writing ability.

Definitions of Terms

L2 Literacy

L2 literacy refers to L2 students' ability to read and write in English, adapted from Collins online dictionary's definition of literacy (i.e. the ability to read and write). L2 students' reading ability was assessed by 20 multiple-choice questions of reading comprehension, while their writing ability by a timed essay in English (writing a 200-word response within 35 minutes). Both the reading and writing items were taken from the retired items in the advanced level of General English Proficiency Test (the GEPT- advanced).

The GEPT-advanced was adopted for two reasons. First, the GEPT-advanced was developed for EFL learners who presumably have equivalent English proficiency as graduates of English majors in undergraduate programs in Taiwan, or as graduates of other majors in master programs in English-speaking countries. In contrast, the GEPT high-intermediate was developed for EFL learners who presumably have equivalent English proficiency as graduates of non-English majors in undergraduate programs in Taiwan. Second, the GEPT-advanced is developed to include test items of higher difficulty level, as compared to the GEPT high-intermediate.

The study targets EFL graduate students in Taiwan majoring in applied linguistics. Presumably, they generally have higher English literacy, as compared to non-English majors of EFL graduate students. In this sense, the GEPT-advanced with test items of higher difficulty as compared to the GEPT high-intermediate may perform better in discriminating L2 (English) literacy the targeted EFL graduate students have.

Identity-Based Writing Motivation

In the present study, RA writing motivation of L2 graduate students in Taiwan is defined as an identity-development process in which EFL graduate students seek to develop an identity of non-native-English-speaking (NNES) researchers by learning to write RAs acceptable to their disciplinary communities (Swales, 1990, 2004). In addition to the Swalestian genre theory, this definition also follows Eccles' (2009) recent proposal that advocates an incorporation of identity-based motivation theory (Oyserman, Terry, & Bybee, 2002) into her expectancy-value theory. Through this motivational lens, the extent to which L2 graduate students intend to achieve this future-researcher identity is assumed to affect subjective values that they assign to learning of RA writing, and expectancy that they have for their ability to complete the learning. If L2 graduate students have a strong intention to achieve this future-researcher identity, they may have a relatively high value and expectancy for learning RAs writing. Also, they may bring a series of subsequent learning actions, and they may protect and sustain the learning actions until they perceive the actions as relatively completed (Eccles, 2009; Oyserman & Destin, 2010; Schunk, Pintrich & Meece, 2008).

In operationalizing the identity-based writing motivation, the present study draws upon Eccles expectancy-value framework. In particular, four constructs from her framework were adopted, including interest value, utility value, cost, and ability self-concept. A new construct, connectedness value (a substitute for attainment value in the expectancy-value framework and a translation of integrativeness in Gardner's (1985) model), was added to reflect a context-specific type of motivation that L2 graduate students have when learning to write English RAs. To conclude, the present study operationalized five subscales of identity-based writing motivation, including Interest Value, Utility Value, Cost, Connectedness Value, and Ability Self-concept.

Connectedness Value

Connectedness value is a new construct proposed in the present study to reflect context-specific motivation of L2 graduate students. Inspired by the construct of integrativeness (Gardner, 1985), connectedness value refers to L2 graduate students' subjective appraisals of reasons and benefits for socializing into a chosen disciplinary community by writing RAs acceptable to the community. Connectedness value also substitutes for attainment value in the expectancy-value framework. As a context-specific type of attainment value, connectedness value represents a specific value for L2 attainment that encompasses gaining a social identity as a recognized researcher in an L2 community. In short, connectedness value refers to L2 graduate students' subjective appraisals of reasons and benefits to gain a researcher identity at a social level that connects them to their chosen disciplinary communities mainly through writing acceptable RAs.

Self-regulatory Writing Strategies

Self-regulatory activities are well-recognized as mediators between personal and contextual resources and actual goal-achievement in learning; they are often termed as self-regulatory learning strategies in educational psychology (Pintrich, 2000, 2004; Wolters, 1998, 1999; Wolters et al., 2003; Zimmerman, 2000, 2008). In particular, self-regulatory learning strategies refer to the overall effort and choice that learners make to manage and control personal and contextual resources for effective learning, as opposed to learning strategies that mainly emphasize the specific effort and choice made for effective learning, such as cognitive or metacognitive learning strategies (Pintrich2004). Knowledge of cognitive and metacognitive strategies for effective learning is not sufficient to account for how learners arrive at learning achievement (Pintrich, 2004; Wolters et al., 2003). Learners have to be motivated to use the

strategies and to manage and regulate their cognition and effort so as to attain learning achievement effectively (Pintrich 2004; Wolters et al., 2003).

In a similar vein of thinking, Oxford (2011) recently defined *self-regulated L2 learning strategies* as “deliberate, goal-directed attempts to manage and control efforts to learn the L2” (p. 12). Aligned with Oxford’s recent proposal, the present study defines self-regulatory Research-Article (RA) abstract writing strategies as perceived effort that L2 graduate students make to effectively regulate cognition, motivation, behavior, and context to better approach RA-abstract writing.

Specifically, when operationalizing self-regulatory RA-abstract writing strategies in this study, the study adapted two subscales from Wolters et al.’s (2003) self-regulatory learning theory, including cognition regulation and motivation regulation. The third subscale in Wolters et al.’s theory, behavior regulation was replaced by a similar scale in Oxford’s (2011) recent proposal: socio-interactive resources regulation, to highlight “the social nature of learning” in L2 attainment (Pintrich, 2004). This social nature of learning can be specified as approaching L2 attainment by effective interaction with context, communication, and culture (Oxford, 2011). To conclude, the present study operationalized three subscales of self-regulatory strategies, including Cognition Regulation, Motivation Regulation, and Socio-Interactive Resources Regulation.

Genre Theory of Rhetorical Moves

Genre is often defined as staged, organized events of communication, articulated by a given discourse community to express rhetorical purposes typical of the community practice, and is formulated as schematic structures to the members of the community (Bhatia, 1993, 2004; Flowerdew, 2011; Swales, 1990, 2004). The schematic structures encompass a sequenced order of communicative events or rhetorical

purposes, called as *moves* or *steps* (sub-components of moves) by Swales (1990) and Bhatia (1993). Moves in the schematic structure are usually realized by linguistic patterns conventionalized by the disciplinary community. Mastering the schematic structures of RA writing requires the ability to use adequate moves in a sequence typical of the disciplinary practices, and the ability to express the moves with the conventional lexico-grammatical patterns in the discipline.

Ability to Write Research Article Abstracts

In order to sample L2 graduate students' ability to write research articles (RAs), the present study took abstracts of RAs under investigation. In the RA genre, abstracts usually contain main rhetorical purposes of a study, such as background, purpose, results, discussion, and conclusion of the study. In this sense, an RA abstract serves as a miniature of an RA providing an overview of the study for readers who will then determine whether or not to continue reading the whole RA throughout. In this study, L2 graduate students' ability to write RA abstracts was assessed by Research Abstract Performance Assessment (RAPA) that consists of a timed abstract-writing task and two corresponding rating scales. Within 60 minutes, the abstract-writing task provided a 10-page research articles written in Mandarin (the participants' L1) and required the participants to compose an English RA abstract. Based on Swales and Feak's (2009, 2010) proposal for evaluating the quality of English RA-abstract, the participants' performances were assessed by two scales, the scale of global rhetorical move and the scale of local lexico-grammatical pattern.

Purposes of the Study

The purpose of this study was to examine the effect of motivation on English RA writing ability in a sample of EFL/L2 graduate students in the field of applied

linguistics in Taiwan. I defined this motivation as identity-based writing motivation, and conceptualized it as an identity-developing process in which L2 graduate students are motivated to seek an NNES-researcher identity in their disciplinary communities through learning to write English RAs acceptable to the communities. In particular, this L2 motivation represents subjective value L2 graduate students assign to English RA writing, and ability self-concept they hold about the likelihood of their success in English RA writing, both of which in turn may account for behavioral choices of RA writing (Eccles, 2009; Eccles & Wigfield, 1995; 2002).

With this framework of identity-based motivation, I initiated a preliminary inquiry into how this motivation variable interacts with its potential covariate, language (L2) literacy, and its potential consequence, use of self-regulatory writing strategies, in explaining RA-abstract writing ability of L2 graduate students. Specifically, the study aimed to:

1. Develop a battery of measures for variables under investigation, including identity-based writing motivation (Identity-based Writing Motivation Inventory, IWMI) and use of self-regulatory writing strategies (Self-regulatory Writing Strategy Inventory, SWSI), and RA-abstract writing ability (Research-Abstract Performance Assessment, RAPA). In particular, RAPA measures the writing performance by RA-abstract writing task and two corresponding rating scales.
2. Investigate the effect of identity-based writing motivation, self-regulatory writing strategies on L2 graduate students' English RA-abstract writing ability with L2 literacy controlled. This investigation was conducted by modeling the inter-relations among these factors. Figure 1 shows the motivated abstract-writing model (the MAW model) proposed.

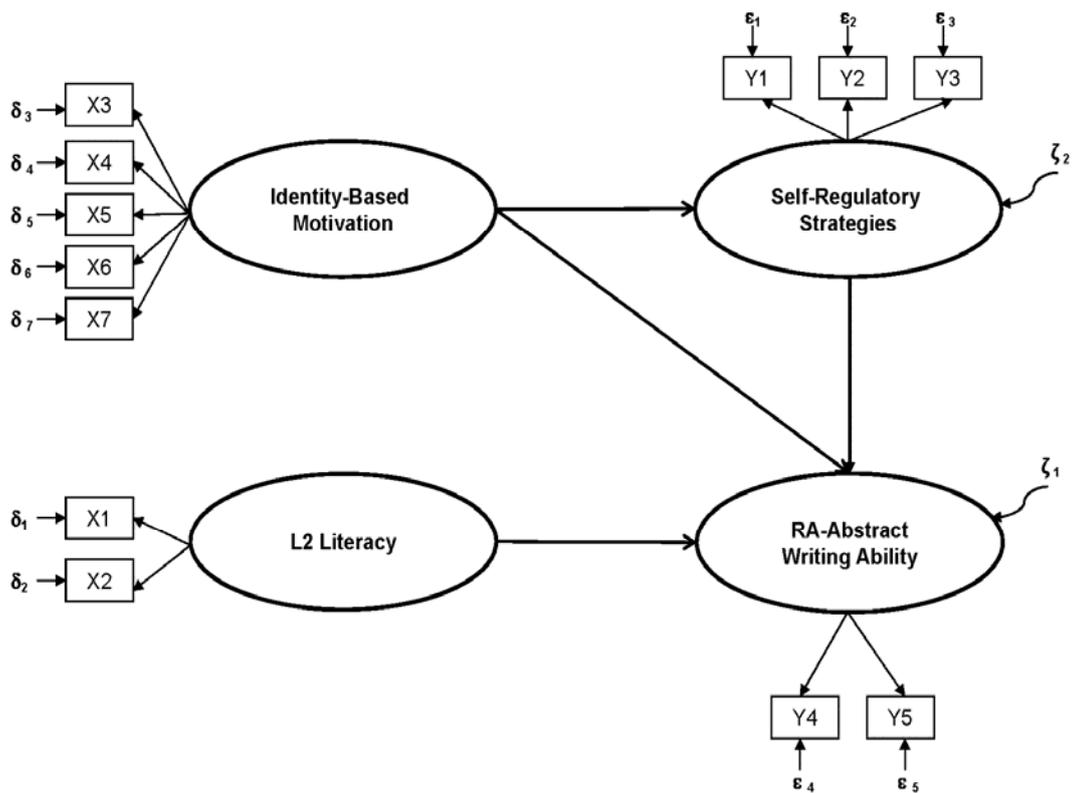


Figure 1. The motivated abstract-writing model (the MAW model). The model presents 4 latent variables and 12 observed variables (X_1 =reading ability, X_2 = writing ability; X_3 =interest value, X_4 =utility value, X_5 =cost, X_6 =connectedness value, X_7 =ability self-concept; Y_1 = cognition regulation, Y_2 = motivation regulation, Y_3 = socio-interactive resources regulation; Y_4 = global move, Y_5 = local pattern).

The MAW model addressed one research question:

1. Do EFL graduate students' L2 literacy, identity-based research-article (RA) writing motivation, and use of self-regulatory RA-abstract writing strategies significantly explain their RA-abstract writing ability?

Moreover, the research question entails 3 corresponding hypotheses to be tested with the observed data in the present study.

Hypothesis 1: While controlling for L2 literacy and use of self-regulatory writing strategies, L2 graduate students' identity-based writing motivation has a direct effect on their English research-article (RA) abstract writing ability.

Hypothesis 2: While controlling for L2 literacy and identity-based writing motivation, L2 graduate students' use of self-regulatory writing strategies has a direct effect on their English RA-abstract writing ability.

Hypothesis 3: L2 graduate students' identity-based writing motivation has an indirect effect on their English RA-abstract writing ability via their use of self-regulatory writing strategies.

Significance of the Study

This investigation of motivated L2 learning of RA-abstract writing is important because developing high RA writing ability is widely recognized as a daunting task for most L2 graduate students irrespective of the number of years they have spent in English learning. Pedagogically, information about how high RA-writing ability can be effectively developed may help instructor and administrator design L2 writing lessons and programs conducive to RA writing.

Information of this kind may also help us find ways to learn L2 graduate students' motivation profiles, and to aid L2 learners in monitoring and sustaining their identity-based writing motivation. With such a knowledge, L2 graduates are more likely to activate, alter, and finally achieve the task of writing acceptable RAs that is

notoriously known for its difficulty. This knowledge may also be applied to designing individual-based and classroom-based instruction that helps L2 graduate students develop English RA writing ability necessary to gain a future researcher identity in their chosen fields. Theoretically, findings of this study may contribute to the advancement in identity-based motivation theory and expectancy-value theory in educational psychology, and L2 motivation theory and genre theory in L2 learning.

CHAPTER TWO LITERATURE REVIEW

The chapter first reviews previous research on genre theory of RAs and on the conceptualization of learning an RA genre as gaining an identity in a disciplinary community. Second, the chapter reviews motivation studies in both fields of L2 learning and educational psychology, including key covariates and mediators of motivation, so as to provide a theoretical background for hypothesizing the motivation effect on L2 graduate students' RA-abstract writing. Third, the chapter proposes a motivated abstract-writing model (the MAW model) in question.

Genre theory of Research Articles (RAs)

General Background of Genre Analysis of RAs

Since Swales (1990) initiated the discussion of the genre of the research article, the topic of genre has been widely-researched in the field of English for specific purposes (Bhatia, 1993, 2004; Hyland, 2000, 2004, Swales, 2004; Swales & Feak, 2009, 2010). Genre is often defined as staged, organized events of communication, articulated by a given discourse community to express rhetorical purposes typical of the community practice, and is formulated as schematic structures to the members of the community (Bhatia, 1993, 2004; Swales, 1990, 2004). Swales' (1990) and Bhatia's (1993) studies on genre mostly focus on research articles (RAs), which present considerable challenges to L2 graduate students given the technicality associated with the writing convention of the RA (Hyland, 2000; Swales, 1990). Writing RA requires condensed and effective representations of content, and thus imposes stricter requirements on the production of schematic structures and linguistic realizations compared to other written genres. Swales' (1990) and Bhatia's (1993) studies on the generic structure of RAs have provided some pedagogical implications, leading to the

development of some important textbooks and instructional practices (e.g., Swales & Feak, 2004, 2009).

With an attempt to shed more light on the RA pedagogy, particularly for L2 graduate students, a myriad of genre studies have followed Swales' tradition by targeting RAs for functional and linguistic analysis (Bhatia, 1993, 2004; Dos Santos, 1996; Hancioglu, 2009; Hsieh & Liou, 2008; Huckin, 2001; Hyland, 2000; Lau, 2004; Pho, 2008). In this extensive ongoing discussion on the RA genre, a general consensus has been reached on how the schematic structures of communication are sanctioned by a given disciplinary community. In particular, Swales (1990) clearly defined the concept of "*discourse community*" to provide a foundation for subsequent discussions of the RA genre (pp. 24-27). According to Swales (1990, pp 24-27), a discourse community:

Has a broadly agreed set of common public goals-- either implicit or tacit.

Has mechanisms for inter-communication among its members-- a crucial feature as members are to interact with each other.

Uses its participatory mechanisms primarily to provide information and feedback-- membership that implies uptake of the group's communication to exchange information.

Utilizes and possesses one or more genres in the communicative furtherance of its aims-- The discourse members have certain expectations about the role of texts, their organization and their use.

Has acquired some specific lexis-- Uses everyday vocabulary in specialized ways or develops its own lexis and acronyms.

Has a threshold level of members with a suitable degree of relevant content and discursal expertise-- Imply mechanisms for changing memberships with a reasonable ration of experts to novices.

In Swale's thinking, cognitively, L2 graduate students strive to acquire the schematic structures of RA writing in order to write RAs acceptable to a disciplinary community. The acceptability of RAs tends to be evaluated by the norms of RAs writing established by a disciplinary community, such as specific lexis for the discipline and schematic structures of RAs. The schematic structures encompass a sequenced order of communicative events or rhetorical purposes, called *moves* or *steps* (sub-components of moves) by Swales (1990) and Bhatia (1993). Moves may be obligatory or optional depending on the disciplinary norms of RAs writing. Moves in RAs may appear in different orders, be embedded in each other, and repeatedly appear. Despite these minor idiosyncratic occurrences of moves, a typical schematic structure of moves can be identified in the typical practices of RAs recognized by a disciplinary community. In addition, moves in the schematic structure are usually realized by linguistic patterns conventionalized by the disciplinary community. In this sense, learning the schematic structures of RAs writing means to acquire the ability to use adequate moves in a sequence typical of the disciplinary practices, and the ability to compose the moves by the lexico-grammatical patterns disciplinarily conventionalized. If L2 graduate students successfully learn a given schematic structure of RA writing, they will be able to write RAs acceptable to their chosen community by mapping functions of the typical moves onto forms of the conventionalized lexico-grammatical patterns.

As stated above, the cognitive demands of learning the RA genre are not only challenging but highly related to social practices of a chosen disciplinary community. A growing body of research has addressed the issues of how L2 graduate students can be socially motivated to learn the schematic structures through the disciplinary practices of RAs writing, and how they strive to gain a researcher identity in the community via producing RAs acceptable to the community (Bhatia, 1993, 2004; Chang & Kanno,

2010; Dos Santos, 1996; Flowerdew, 2000; Hancioglu, 2009; Hsieh & Liou, 2008; Huckin, 2001; Huang, 2010; Hyland, 2000; Swales, 1990; Swales & Feak, 2004). In these studies, learning of RAs writing is often conceptualized as an identity-development process in which L2 graduate students seek to achieve a future researcher identity as competent RA writers in their chosen communities (Chang & Kanno, 2010; Flowerdew, 2000; Huang, 2010), who can write RAs conforming to their disciplinary practices. This RA writing ability makes L2 graduate students eligible to gain a legitimate identity in their disciplinary communities, suggesting their qualification to actively engage in more community discussions in the future.

A number of recent studies have launched qualitative inquiries into the identity-development process of NNES researchers in academic practices. Flowerdew (2000) presented a case study on a NNES-researcher that sought for successful publication by negotiating content and forms of his RA with journal editors and reviewers. This negotiation process revealed the difficulties the NNES-researcher faced at the levels of subject-knowledge and language when seeking a legitimate identity in a disciplinary community via writing RA acceptable to that community. Likewise, Huang (2010) documented the language challenges that NNES PhD students in scientific disciplines face in the publication practices of RAs. These students perceived their English writing skills as limited for successful publications. However, they were not motivated to learn the writing skills because (a) they did not perceive English writing skills as important to their academic engagement; (b) they did not perceive writing instruction as effective; and (c) they perceived that their advisors mostly dominate the publication practices, giving them less control over the practices. Huang concluded that NNES PhD students may be motivated to write better research articles for more active participation in their disciplinary practices, if they (a) believe a better RA-writing ability as essential for their success in their disciplinary practices, (b) are

well-supported with development in subject knowledge and English language, and (c) are given more control over their practices of RA writing.

In a similar qualitative inquiry, Chang and Kanno (2010) highlighted the cross-disciplinary differences in the identity-development process by presenting the perspectives of PhD students and their advisors on the importance of English proficiency to their discursively disciplinary practices. Despite being NNES with more language barriers in English use, the students demonstrated their ability to make best use of their cultural or technical capitals to gain a legitimate membership in their disciplinary communities. Yet across the three disciplines (engineering, economics, and Chinese), the importance of English proficiency to academic success was recognized to varying degrees, depending on disciplinary communities, community practices, and different community members. For engineering and economics, the PhD students perceived the community practices in their fields as more language-independent, although their advisors perceived English proficiency as a basic requirement for their community practices. For Chinese, both the PhD student and her advisor regarded their community practices as highly language-dependent due to the technical requirement in their subfield, linguistics. Apparently, NNES PhD students and their advisors perceived a varying degree of importance of English proficiency to students' navigation in academia.

In short, motivated L2 learning of RAs writing can be viewed as motivational striving to gain an identity as a legitimate researcher in a chosen disciplinary community, and as cognitive learning of the schematic structures of RAs.

Genre Analysis of Research Article Abstracts

Rhetorical moves and lexico-grammatical patterns. With respect to approaching RA writing convention, the abstract of an RA may be a reasonable place to

start. An abstract of RA is defined as a miniature in presenting the design and significance of the studies by highlighting aims and their conclusions (Dos Santos, 1996; Hyland, 2000). In discussing rhetorical purposes of an abstract, Swales and Feak (2009, 2010) cited Huckin's (2001) definitions of abstract, and added a fifth purpose to make a list of rhetorical purposes of abstracts more comprehensive.

1. They function as stand-alone mini-texts, giving readers a short summary of a story's topic, methodology, and main findings;
2. They function as screening devices, helping readers decide whether they wish to read the whole article or not;
3. They function as previews for readers intending to read the whole article, giving them a road-map for their reading;
4. They provide indexing help for professional abstract writers and editors;
5. They provide reviewers with an immediate oversight of the paper they have been asked to review.

To fulfill the rhetorical purposes, research abstracts are expected to have a clear information structure to present aim, method, results, and findings of the studies. The information structure of research abstracts has been systematically analyzed by "moves" in the field of English for academic purposes (Hyland, 2000; Swales & Feak, 2004). "Moves" in abstracts are defined as communicative acts deemed conventional in a given written discourse community, such as "moves" of stating research purpose, describing research methods, reporting results, and discussing research findings. Swales and Feak (2004) propose a coding scheme of moves to familiarize L2 graduate students with the information structure in research abstracts in Applied Linguistics, including moves of Background-Aim-Method-Results-Conclusion. In short, abstracts of RA should be written concisely and clearly enough to encapsulate the essence of an RA, including background, purpose, results, and conclusion of the study (Hsieh & Liou,

2008; Lau, 2004; Pho, 2008; Swales & Feak, 2009, 2010). Therefore, this study focuses on RA abstracts.

In line with the tradition of genre analysis, the genre analysis of RA abstracts started from analyzing the move structure (Dos Santos, 1996; Lau, 2004). Once the move structure was identified at the global level, a growing number of studies have continued the genre analysis by exploring how global move structures are realized by local structures, such as types of links between the first two sentences (Swales & Feak, 2010), and lexico-grammatical patterns (Hsieh & Liou, 2008; Pho, 2008; Hancioglu, 2009). Such patterns have been exemplified in the literature as follows: *the purpose of the study aims to* in the *Aim* move; *the results show that* in the *Results* move; *the findings indicate that* in the *Conclusion* move. Likewise, when outlining the contents of their textbook for instruction of abstract writing, Swales and Feak (2009, 2010) also state these two levels of abstract structure, namely global structure of rhetorical move, and local structure that includes “types of opening sentence, links between the first two sentences, the forms of purpose statement, and the construction of appropriate highlighting statements” (p 168). They further claim that analyzing abstracts from the global structure to the local reflects the learning trajectories from “analysis, to awareness, and to acquisition.” Therefore, analysis on these two levels of abstract structure may be further applied to evaluation of the quality of RA abstracts by developing two corresponding rating scales of RA abstracts.

Scoring rubric of RA abstracts writing. An increasingly growing body of studies on RA abstracts has revealed the importance of both global rhetorical moves and local lexico-grammatical patterns when evaluating the communicative effectiveness of an abstract (Dos Santos, 1996; Hsieh & Liou, 2008; Pho, 2008; Hancioglu, 2009; Swales & Feak, 2004, 2009, 2010). Such evaluation of abstracts has been widely adopted in qualitative text-analysis (Hsieh & Liou, 2008; Pho, 2008; Hancioglu, 2009).

Yet, a rating scale that quantitatively evaluates RA abstracts in a standardized way has yet to be developed. To bridge this gap, the present study attempts to translate the two-level evaluation from the traditional qualitative analysis into a quantitative measure by developing two corresponding rating scales. The rating scales may serve as a tool to assess L2 graduate students' writing ability of RA abstracts in a relatively standardized way. The rating scales will make possible ranking of the RA-abstract writing ability among a number of participants. This ability ranking then can be applied to quantitative studies that tend to show an overall learning pattern of a larger number of students, in contrast to qualitative inquiries that usually reveal idiosyncratic developments of a smaller number of students.

A similar thinking is evident in Stroller, Horn, Grabe, and Robinson's (2005) development of a rating scale for chemistry reports of undergraduate writing. They organized a group of faculty members in applied linguistics and chemistry, who served in an expert panel to develop holistic and analytical rating scales. The expert panel defined meaningful criteria of the rating scales according to the norms of English-writing in general and chemistry discipline-based writing in particular. More specifically, the expert panel developed distinct score-points and score-descriptors for these two scales. Taking the analytical rating scale for example, a 6-point scale was assigned for rating, Score 6 showing the highest performance, Score 1 the lowest. In this scale, five aspects of writing are assessed, including organization, audience and purpose, writing conventions, grammar and mechanics, and science content. Particularly for organization, they used rhetorical moves to describe the corresponding criteria on the 6-point scale, as shown below:

Score 6: All obligatory moves are present, fully developed, and in the correct order.

No extra moves are present.

Score 5: All obligatory moves are present, but one is out of sequence or has minor

problems. No extra moves are present.

Score 4: All obligatory moves are present, but a few have minor problems or are out of sequence. Extra moves may be present.

Score 3: One (sub)move is missing or underdeveloped. (Sub)moves may be out of sequence. Extra moves may be present.

Score 2: Two (sub)moves are missing or underdeveloped. (Sub)moves may be out of sequence. Extra moves may be present.

Score 1: Three (sub)moves are missing or underdeveloped. (Sub)moves may be out of sequence. Extra moves may be present.

Apparently, Stroller et al. (2005) demonstrated the feasibility of developing a rating scale that assesses the use of rhetorical moves in the writings of undergraduates majoring in chemistry in a quantitative and standardized manner. Stroller et al. (2005) also pointed out that applied linguists may perceive the scoring descriptors developed by chemistry experts as restrictive because the descriptors quantify the number of permissible mistakes on each score level. This quantifying description however reflects the disciplinary culture of chemistry, namely, being precisely accurate. Therefore, disciplinary culture needs to be considered when developing a rating scale with the content and descriptor on each score level specified.

Taking disciplinary culture into account, the present study will adopt Stroller et al's practice to develop a scoring rubric for RA-abstract writing in applied linguistics. Specifically, the present study will translate the global rhetorical moves and local lexico-grammatical patterns into two rating scales. These two scales have been recognized by many applied linguists as two major indicators for the quality of L2 graduate students' RA-abstract writing ability (Hsieh & Liou, 2008; Liou, Yang, & Chang, 2011; Swales & Feak, 2004; 2009; 2010).

L2 Motivation, Self-regulatory Strategies, Language Proficiency, and RA-abstract Writing Ability

This subsection reviews L2 motivation research with a focus on Gardner's (1985, 2007) socio-educational model and Dörnyei's (2006, 2009) responses to Gardner's model. This subsection also reviews a modern expectancy-value theory (Eccles et al., 1983) so as to relate this motivation theory to motivated L2 learning. Particularly, the subsection highlights Eccles' (2009) recent proposal that integrates the expectancy-value theory with the identity-based motivation theory (Oyserman, Terry, & Bybee, 2002). And the subsection describes the application of Eccles' (2009) proposal and Gardner's model (2007) to the L2 motivation process in question that is termed as identity-based writing motivation. Finally, the subsection reviews studies that suggested associations among motivation, self-regulatory strategy use, language proficiency, and writing ability.

General Background of L2 Learning Motivation

In defining second language (L2) motivation, Gardner's (1985) socio-educational model has been one of the most dominant theories over the past three decades (Csizér & Dörnyei, 2005; Dörnyei, 2001, 2005; Huang, 2007; LoCastro, 2001; MacIntyre, 1994, 2002; Masgoret & Gardner, 2003; Oxford & Shearin, 1994; Yashima, Zenuk-Nishide, & Shimizu, 2004). The socio-educational model is operationalized by Attitude Motivation Test Battery (AMTB) that assesses Attitudes toward the Learning Situation, integrativeness, Motivation, Language Anxiety, Instrumental Orientation, and Parental Encouragement (Gardner, 1985). At the heart of the AMTB, the Integrative Motive plays a central role in conceptualizing how and why L2 learners can be motivated by taking educational and cultural contexts into account. The Integrative Motive subsumes

three major variables: attitudes toward the learning situation, integrativeness, and motivation. Attitudes toward the learning situation refer to a learner's evaluation of the educational context, such as a classroom setting, reflecting the importance of the cultural context in language learning, integrativeness reveals L2 learners' willingness to obtain an identity for communicating with the target-language community. Motivation is defined as a combination of desire to learn, interest in the target language, and efforts at learning. Attitudes toward the learning situation and integrativeness act as two influential antecedents of motivation, and these three motivational factors interact with each other to influence the ultimate success of L2 learning.

However, the socio-educational model has received widespread criticisms due to its limited applicability to contexts of foreign language learning, and insufficient consideration of how the situation-specific factors may contribute to changes in L2 learning motivation (Dörnyei, 2001, 2002, 2005; MacIntyre, 2002; MacIntyre, et al., 2009; Oxford & Shearin, 1994). For example, the socio-educational model has been criticized for its relatively constrained perspective that mainly takes the context of learning French as a second language in Canada into account (MacIntyre, 2002; Matthews, 2008, Dörnyei, 2002, 2005), making the model less applicable to other contexts of foreign language learning (MacIntyre, 2002; Oxford & Shearin, 1994). In addition, Dörnyei (2002, 2005) points out that Gardner's (1985) model does not pay enough attention to how situation-specific learning may influence L2 learning motivation. Dörnyei (2002, 2005) thus calls for situating L2 learning motivation at a specific task to reflect the dynamic nature of learning process, in which motivation may fluctuate rather than stay stable throughout.

Relating Identity-based Writing Motivation to Their RA-abstract Writing Ability

The modern expectancy-value theory. Given the serious challenges to Gardner's socio-educational model, a number of L2 motivation researchers tend to seek alternative solutions by examining to what extent key motivation constructs established in educational psychology can be applied to L2 studies, such as intrinsic motivation, achievement goals, and expectancy-value beliefs (Deci & Ryan, 1985; Dörnyei, 2001; Eccles & Roeser, 2009; He, 2005; MacIntyre, 2002; Liem, Lau, & Nie, 2008; Mori, 2002; Mori & Gobel, 2006, Oxford & Shearin, 1994). The Expectancy-value theory, one of the most well-established motivation theories in educational psychology, has received increasing attention in L2 fields (Eccles & Roeser, 2009; Liem, et al., 2008; Matthews, 2008; Mori, 2002; Mori & Gobel, 2006). The expectancy-value theory is composed of two major motivational beliefs: learners' expectancy for success in achievement-related tasks, and their subjective value of task engagement (Bruinsma, 2004; Eccles, Adler, Futterman, Goff, Kaczala, & Meece, 1983; Eccles, & Wigfield, 1995; 2002; Luttrell, Callen, Allen, Wood, Deeds, & Richard, 2010; Pintrich, & De Groot, 1990). These two beliefs can be phrased by two questions: "Can I do this task?" and "Do I want to do this task and why?" (Eccles et al., 1998). The two motivational beliefs will be discussed according to Eccles (2009) recent proposal that integrates the expectancy-value perspective into a dynamic process of identity-development so as to better predict how individuals arrive at behavioral choices for achievement-related tasks.

When discussing the Eccles expectancy-value theory, it is of great importance to review Atkinson's (1957) achievement motivation theory given the fact that the Eccles expectancy-value theory largely stems from this theory. When defining motivation for achievement-related behaviors, Atkinson (1957) proposed three key components,

namely, motives, expectancy for success, and incentive value. Atkinson described motives as drives to achieve, and proposed two types of motives: “motive to approach success” and “motive to avoid failure.” The two motives subsequently affect the individuals’ choice, engagement, and performance of achievement-related tasks. He defined expectancy for success as the extent to which individuals expect success or failure in achievement-related tasks, and incentive value as the perceived importance of task success or failure. Moreover, he argued that individuals tend to place more importance on a task when they perceive the task as more difficult or when they perceive a higher probability of failing the task.

However, this view on the positive correlation between high task value and great probability of task failure is less often adopted in educational psychology. Instead, high task value is deemed as positively correlated to great probability of task success (Eccles & Wigfield, 1995, 2002). Different from some other expectancy-value researchers, Atkinson (1957) placed less emphasis on the role context plays in shaping motivational beliefs and subsequent motivated choices and performance of tasks. In contrast, expectancy-value theorists, such as Eccles and her colleagues (Eccles et al., 1983; Eccles & Wigfield, 1995, 2002) emphasized the importance of context. They argued that context both cues and constrains motivated choices available for the individuals by the sanctioning of social norms of particular groups, such as social role systems, nature of ability, and definition of success. These social norms are often conveyed by key socializers (e.g., parents, teachers, or friends) with whom the individuals frequently interact. Through the input of key socializers, the norms are more likely to be internalized into the individuals’ value system. Accordingly, the norms often shape the individuals’ attribution of past experiences regarding task success or failure, their affective memories of those experiences, and their expectation and value of achievement-related tasks. Eccles and Wigfield (1995, 2002) emphasized how social

norms shape the individuals' motivation beliefs through a series of social and psychological processes, making their expectancy-value model more predictive of individual's motivated pursuit and success of achievement-related tasks.

Synthesis of the expectancy-value theory and identity-development process.

Recently, Eccles (2009) refined the expectancy-value model by conceptualizing motivated pursuit and success of achievement-related tasks as a part of identity development. From this perspective, identity consists of two personal beliefs: (a) beliefs pertaining to personal characteristics and competences, and (b) beliefs pertaining to personal values and goals. These beliefs can be specified as related to motivational beliefs discussed above, individuals' expectancy for success in achievement-related tasks, and their value of task engagement. In addition, Eccles (2009) conceptualized identity at two levels, namely, personal and collective identities. Personal identities refer to properties or characteristics that distinguish the individuals from other people. Collective identities refer to properties that connect the individuals to important social communities (e.g., gender, culture, class, and other interest groups). To be connected to a given social community, the individuals need to be willing to acquire an affinity with the community, and to adopt the community norms for behavioral choice and regulation. By doing so, the individuals are more likely to develop the collective identity with a legitimate membership in the community. In other words, the individuals tend to envision an ideal combination of personal identity and collective identity when developing identities for the future. As their identities develop differently over varying tasks and activities, the individuals often assign different values and expectancy for tasks depending on the degree to which they intend to develop the identities, the degree to which the task success promotes their identity development, and how well they think they can succeed in the task (Eccles, 2009).

Personal and collective identities that individuals intend to develop are

dynamically fluid in terms of contents, salience, and relevance across contexts and over time. In particular, contents, salience, and relevance of varying personal and collective identities are subject to (a) the social and psychological experiences the individuals have, (b) the individuals' agency in interpreting those experiences to enact, redefine, or threaten specific personal or collective identities, and (c) the co-construction of the identities by the individuals and the people with whom the individuals interact frequently across contexts and over time (Eccles, 2009). Greatly shaped by these three dimensions of, identities at the personal and collective levels are changing in nature, making identity-development a dynamic process under the influence of context. This identity-development process in the Eccles expectancy-value model is illustrated in a simplified version in Figure 2 (Eccles, 2009, p. 80).

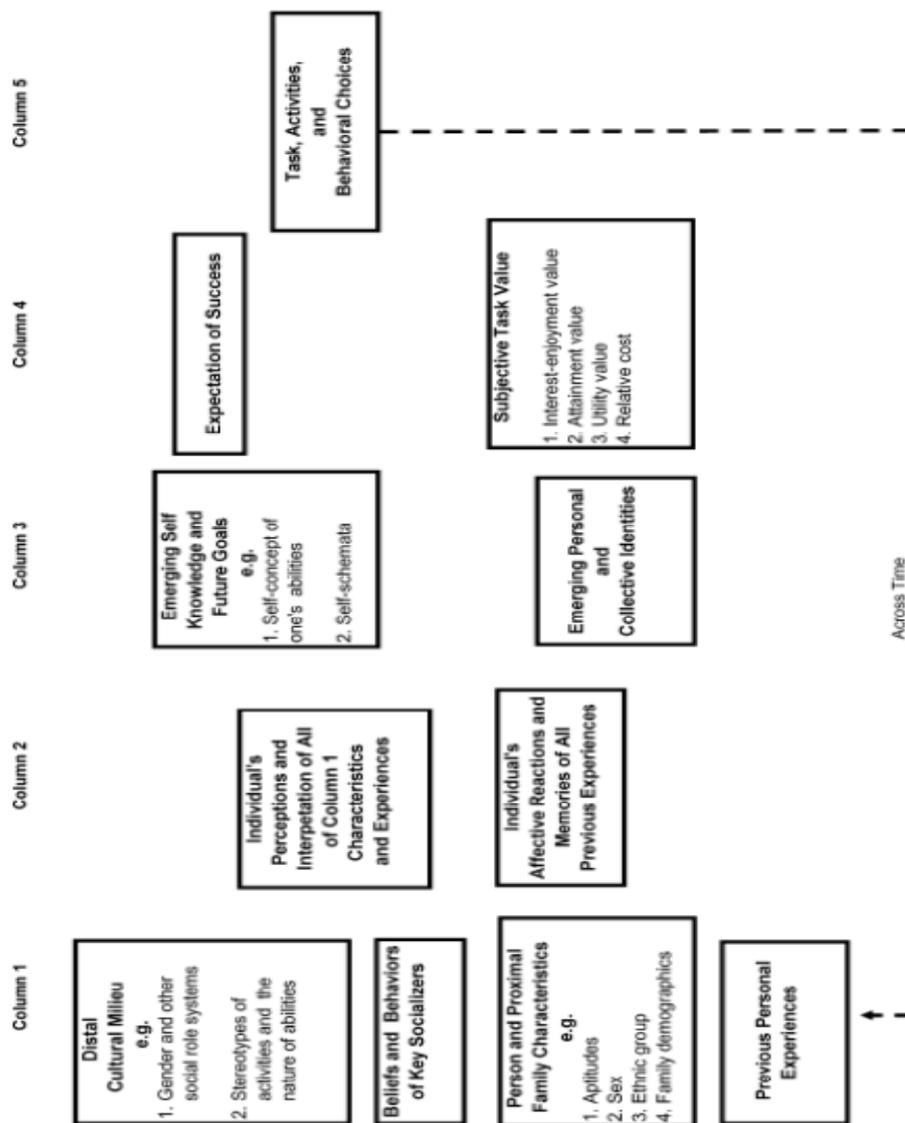


FIGURE 1 Simplified version of the Eccles et al. Expectancy Value Model of Motivated Behavioral Choice. Note: The number items within several of the boxes are just examples. Boxes represent large categories of constructs at the same theoretical level. Causal influences assume to go predominantly from left to right. I have left out the arrows for simplicity. By and large, constructs within a column influence each other reciprocally. Since the model plays out over time, I have included one arrow to illustrate the fact that today's choices become part of tomorrow's history of experience. This arrow includes the agentic effects of individual's choices on subsequent behaviors of socializers and the larger cultural milieu.

Figure 2. Simplified version of the Eccles et al. expectancy-value model of motivation.

The influence of context tends to be exerted by key socializers (e.g., parents, teachers, or friends) to whom the individuals are frequently exposed. The key socializers tend to effectively convey particular social norms, such as social-role systems, activity stereotypes, and ideal characteristics critical to given social groups. Interacting with the key socializers, the individuals tend to gradually internalize these conveyed social norms into their value systems through a socio-cognitive process involving three major factors (see Figure 2). Arranged from the most indirect to the

more direct factors in predicting the individuals' choices for achievement-related tasks, the factors are presumably the individuals' (a) past experiences in task success or failure, (b) interpretations and affective reactions and memories of their past experiences and (c) desired personal and collective identities in the future. Against the backdrop of developing the desired identities, two motivational beliefs are recognized as bringing "the most proximal psychological influences" on individuals' task choices and engagement, namely, the expectancy for task success and the subjective values of task engagement (Eccles, 2009). The two motivation beliefs of expectancy and value have been well-supported as significant predictors for the individuals' behavioral choices of the task (Bruinsma, 2004; Conley, 2007; Eccles et al., 1983; Eccles & Wigfield, 1995; Kyttälä & Björn, 2010; Tseng & Schmitt, 2008). Note that although these motivation-related factors and the subsequent task choice and engagement are arranged by presumably causal relations, they exert reciprocal influences among each other over time (Eccles, 2009). For example, today's task choices will be tomorrow's past experiences of the tasks. With the reciprocal interactions among these factors, the Eccles expectancy-value model may account for how the individuals arrive at choices for achievement-related tasks in a socio-cognitively motivated process.

Briefly stated, the expectancy-value theory conceptualizes identity at personal and collective levels and views identity-development as a dynamic process over time. Personal and collective identities include not only the contents of what achievement-related tasks and activities enable the individuals to successfully develop these identities, but also the individuals' motivational beliefs about the salience and importance of these identities. The contents, salience, and importance of personal and collective identities are constantly subject to: (a) the individuals' social and psychological experiences, (b) their subjective interpretations on those experiences, and (c) a co-construction process of these identities involving the individuals and the people

with whom they interact frequently. In this socio-cognitive process, identities at the two levels are dynamically evolving across context and over time.

As the contents of the identities include particular achievement-related tasks and activities, Eccles (2009) further elaborated that the salience and importance of the identities can be directly observed by two motivational beliefs: one's subjective value of task engagement and expectancy for task success. With regard to subjective task value, Eccles and her colleagues (Eccles, 1983, 2005; Eccles & Wigfield, 1995; 2002) proposed four constructs: interest value, utility value, attainment value, and cost. Interest value refers to inherent interest that individuals gain from the task engagement itself. Engaging in the task with inherent interest over time, individuals are more likely to develop a growing ability in the task success. The ability and interest of the task may later become one critical characteristic of individuals' identities (Eccles, 2009).

Utility value refers to the degree to which the task engagement helps individuals meet their short or long-term goals. These goals are translated into concrete actions and they are deemed farther from acquiring the desired identities in the future, as compared to attainment value which is discussed below.

Attainment value indicates the importance of task success to the development of personal or collective identities. Attainment value manifests that task success promotes individuals' development of their desired personal and collective identities in the future, rather than disconfirmation of these identities (Conley, 2007; Eccles, 2009). Moreover, Eccles (2009) proposed four assumptions about attainment value and identity development: (a) Individuals attempt to possess characteristics critical to their desired personal and collective identities; (b) varying tasks provide varying probability for such possessions; (c) individuals assign higher subjective values to the tasks with higher probability to acquire their desired identities; and (d) individuals prefer tasks with higher subjective values to tasks with lower values. Consequently, attainment value

affects individuals by increasing the possibility of performing tasks deemed as congruent and critical to their desired identities, and by decreasing the possibility of performing tasks incongruent or marginal to the identities.

Cost indicates the price individuals may pay for the task engagement because the choice of engaging in one task usually eliminates choices of other tasks or activities. Cost refers to the accumulations of negative appraisals that the individuals draw to the task engagement, and may include emotional price (fear of failure, anxiety for the task engagement), and time and effort required for the task (Conley, 2007). If cost for the task engagement is perceived as unbearably high, the task will be devalued (Luttrell, et al., 2010). On the other hand, the other three value-related beliefs increase the value of task engagement. These four value-related beliefs will be synthesized into an overall task value, which will influence the individuals' task choice, engagement, and success (Conley, 2007; Eccles, 2009; Eccles & Wigfield, 1995, 2002; Luttrell et al., 2010).

The other motivational belief is expectancy for task success, that is, individuals' perceptions about how well they will perform the achievement-related tasks. Eccles and her colleagues argued that individuals opt for the tasks that they perceive most efficacious (Eccles & Wigfield, 1995, 2002; Wigfield, 1994; Wigfield & Eccles, 2002). In the expectancy-value model, they operationalized expectancy for success by ability self-concept and perceived task difficulty, yet found that ability self-concept reflects expectancy for success so directly that it is difficult to distinguish these two concepts. When developing ability self-concept, individuals tend to evaluate their ability by interpersonal and intrapersonal comparisons (Eccles, 2009). That is, individuals tend to compare their own abilities in task success with other people and with their own abilities across other subjects. Generally speaking, expectancy for task success can be phrased by two questions: "How good am I at X?" and "Which areas am I better at or more likely to do well at?" (Eccles, 2009, p. 82).

To recap, Eccles (2009) recently incorporated identity and identity-development into her expectancy-value theory to describe how the individuals arrive at motivated choices for achievement-related tasks. Eccles (2009) defined identity at the levels of personal and collective identities. She argued that identities encompass contents, salience and importance of the identities. She specified that contents refer to how the individuals develop these identities through varying tasks and activities, while salience and importance of the identities can be observed from two motivational beliefs: expectancy and value that the individuals assign to the tasks. Empirically, expectancy can be operationalized by individuals' ability self-concept for task success; and subjective values by four motivation beliefs, interest value, utility value, attainment value, and cost. Moreover, the contents, salience, and importance of the identities are subject to a contextualized socio-cognitive process involving three crucial factors: the individuals' social and psychological experiences, their subjective interpretations of those experiences, and a co-construction process by the individuals and key socializers around. In this socio-cognitive process, key socializers often convey the norms and values of given social groups, while an individual decides to which extent he/she adopts the norms and values. In turn, this socio-cognitive process often shapes how the individuals interpret their past experiences of the task, what tasks and activities they perceive as key contents for identity development, and how they perceive the salience and importance of identity development. In this sense, identity-development is defined as a context-dependent process, and can account for the fluidity of individuals' motivation for achievement-related tasks, and for their behavioral choices for the task.

In fact, Eccles' (2009) proposal of incorporating the identity-development process into the expectancy-value theory seems to echo a growing body of educational psychology research that explores whether and how identity-development triggers motivation for learning achievement (Oyserman, Terry, & Bybee, 2002; Oyserman,

Bybee, & Terry, 2006; Oyserman & Destin, 2010). In this trend of discussion, identity-development is viewed as a dynamic process susceptible to context (Oyserman, Terry, & Bybee, 2002; Oyserman, Bybee, Terry, & Hart-Johnson, 2004; Oyserman & Destin, 2010). In this contextualized identity-development process, identity is related to three key postulates, including “action readiness, dynamic construction, and interpretation of difficulty” (Oyserman & Destin, 2010, p 1003). First, identities trigger readiness to act. At a specific level, identities affect which achievement-related tasks individuals perceive as relevant to identity-development. At a general level, identities affect how individuals interpret the world by “norms, values, strategies, and goals” relevant to the identities (Oyserman & Destin, 2010, p 1017). Individuals are usually ready to take the tasks, goals, or values relevant to their ideal identities, with an attempt to acquire the identities. Second, identities are dynamically constructed in contexts. This dynamic construction of identity reflects the fact that the identity-development process constantly interacts with context through people with whom individuals interact, and through the contextual highlights on particular identities that the individuals perceive as relevant to the present and desire to develop in the future. This dynamic construction of identity in turn affects the individuals’ choices for what to pay attention, and what to do in their subsequent action plans (Oyserman & Destin, 2010). Third, identities affect how individuals interpret difficulty by the criteria of whether difficulty is congruent to development of their desired identities. If they perceive difficulty as identity-congruent, they tend to interpret it as important rather than impossible, and tend to make more efforts to resolve the difficulty. This difficulty interpretation in turn influences value-assignment, choice, and performance of achievement-related tasks. With the three postulates, Oyserman and Destin (2010) propose the term “identity-based motivation” to conceptualize the motivated learning process in which future possible identities stimulate individuals’ motivation for learning in academic

settings. This identity-based motivation serves as trigger for individuals' subsequent learning actions so as to achieve learning success critical to their future identities.

As stated above, the expectancy-value theory (Eccles & Wigfield, 1995, 2002) and the identity-based motivation theory (Oyserman et al., 2002; Oyserman & Destin, 2010) both emphasize the need to contextualize motivated learning in a specific task. The present study will adopt this thinking in defining L2 motivation.

Application of the expectancy-value theory to L2 research. A number of L2 researchers have applied the expectancy-value theory to a particular task of L2 learning. For instance, Mori (2002) has applied the theory to defining Japanese learners' motivation for English reading. Mori and Gobel (2006) investigated the interaction among expectancy-value beliefs, gender, and Japanese learners' English abilities. Mori and Gobel (2006) identified four motivation constructs, including intrinsic value, attainment value, amotivation (to what degree Japanese learners are not motivated to learn English), and integrativeness (the willingness Japanese learners have to socialize into English-speaking communities). Note that utility value was loaded on the integrativeness factor, rather than standing out as an independent construct in their study. On the other hand, Liem, Lau, and Nie (2008) examined the role of L2 learners' expectancy-value beliefs and achievement goals in predicting learning strategies, task disengagement, and English ability. Matthew (2008) explored learners' expectancy-value beliefs about learning English and their behaviors of seeking tutorials. In light of the great potential of the expectancy-value theory in predicting L2 learning, the present study applies this theory to a specific L2 learning task, i.e., writing research articles (RA) in English. More specifically, the present study follows Eccles' current proposal of incorporating the identity-based motivation theory (Oyserman et al., 2002) into the expectancy-value theory.

Through the lens of the expectancy-value theory, Eccles' (2009) recent model

described the dynamic identity-development process as one where the individuals are motivated to develop desired identities within given contexts by performing achievement-related tasks. She argues that her refined expectancy-value model can better predict individuals' motivated choice, engagement, and performance of the tasks. Following Eccles' (2009) proposal, the present study aims to describe an identity-development process in which L2 graduate students are motivated to develop a non-native-English-speaker-researcher identity in their chosen fields through writing acceptable RAs. This motivated trajectory is termed the identity-based writing motivation. In operating this writing motivation, the influence of context is taken into account. That is, the study includes L2 graduate students' past experiences of English learning in general as one motivation covariate, and L2 graduate students' expectancy and value of RA writing as operationalization of the perceived salience and importance of RA writing. In addition, one important concept in Gardner's socio-educational L2 motivation is incorporated into this writing motivation as explained below. In this way, I hope to reveal a clearer picture about how L2 graduate students arrive at the motivated choice, engagement, and performance of RA writing.

Specifying L2 graduate students' connectedness value for their identity-based writing motivation. Even though some variables associated with L2 learning motivation may be similar to those associated with learning of other subjects, it is undeniable that L2 cultural context often influences L2 learning (Gardner, 2007; MacIntyre, 2002; Dörnyei, 2001, 2002, 2005; Yashima, Zenuk-Nishide, & Shimizu, 2004). The cultural-context influence on L2 learning may reflect the degree to which learners are interested in the target language per se, and in interacting with the target language communities. More specifically, learners who are more willing to seek "psychological identification" with the target language community are more likely to achieve the ultimate attainment of L2 learning (MacIntyre, 2002, p. 54). In Gardner's

L2 motivation model, this cultural-context influence is conceptualized as integrativeness that comprises three components, namely, attitudes towards the target group, interest in foreign languages, and integrative orientation.

This widespread recognition of the cultural-context influence on L2 learning may help explain the fact that despite serious challenges to Gardner's model as mentioned earlier, the concept of integrativeness is still widely incorporated in L2 studies (Csizér & Dörnyei, 2005; Dörnyei, 2001, 2002, 2005; MacIntyre, 2002; Yashima, Zenuk-Nishide, & Shimizu, 2004). Integrativeness has stimulated the development of new L2 motivation constructs, such as "international posture" and "ideal L2 self." "International posture" includes an "interest in foreign or international affairs, readiness to interact with intercultural partners, and a non-ethnocentric attitude toward different cultures" (Yashima, 2002, p. 57). "Ideal L2 self" refers to one's ideal identity who has a good command of an L2, and it will motivate one to pursue the realization of the ideal self (Dörnyei, 2005).

In fact, Dörnyei (2005, 2009) proposed incorporating the identity-based motivation into L2 learning by developing an L2 motivational self system that subsumes three elements: ideal L2 self, ought-to L2 self, and L2 learning experience. Ideal L2 self refers to a possible self who will be capable of using an L2 fluently; it boosts a promotion of a preferable future self for L2 learners. Ought-to L2 self refers to an obligatory possible self who needs to meet expectations of significant others or social communities; it functions as a prevention of negative or feared future outcomes for L2 learners. The third element of the L2 self system, L2 learning experience, denotes situation-specific motives that seek a personal fit into the immediate learning environment (e.g., program, teacher, curriculum, and peers) so as to achieve optimal L2 learning in the present experiences. L2 learning experience differs from the other two dimensions of future L2 selves in that (a) it focuses on the present, not the future, by

assigning subjective interpretations of the past success or failure in L2 learning, and (b) it takes an ongoing L2 learning activity that can stimulate situation-specific motives.

In this system, Dörnyei (2005, 2009) conceptualized motivated L2 learning as a dynamic process of identity-development. In particular, he highlights how time and context interact in shaping L2 learners' envisioning of one of their future identities as a competent L2 user. In the L2 Self System, Dörnyei (2005, 2009) apparently draws upon Eccles' (2009) and Oyserman's (2010) proposal that the individuals' motivated choices should be contextualized in the achievement-related tasks conducive to development of ideal identities. However, the L2 Self System describes L2 learning at a relatively general level, although the need to contextualize L2 learning in particular tasks is repeatedly underscored (Dörnyei, 2005, 2009). By contextualizing L2 learning in a well-specified task, future studies may generate more fruitful insights into motivated L2 learning from the identity-development perspective.

Likewise, Gardner (2007) argued for the need to contextualize motivated L2 learning in a specific task. That is, he proposed an updated definition of integrativeness, to increase the applicability of integrativeness to motivated L2 learning across contexts. Originally, Gardner (1985) defined integrativeness as "being interested in learning the language in order to interact with valued members of the other community and/or learn more about the community." Recently, he redefined integrativeness as "openness to cultural identification, and/or a favorable attitude and interest in English speaking [target language] communities" (Gardner, 2007, p.16). More importantly, the target community refers to any speakers of English, rather than English native speakers only. Apparently, Gardner hopes to stimulate more research efforts to apply this motivation construct to varying context-specific L2 learning. Following this logic, the present study incorporates the idea of integrativeness into L2 graduate students' motivation to write English research-articles (RA) acceptable to their disciplinary communities.

Specifically, a term “connectedness value” was coined to represent integrativeness in the context of graduate institutes where L2 graduate students seek to connect with a chosen English-using disciplinary community through writing RAs acceptable to that community.

In the present study, connectedness value is defined as an identity-development value that L2 graduate students perceive for RA writing. That is, connectedness value refers to subjective appraisals of reasons and benefits that L2 graduate students assign for gaining a social identity as a non-native-English-speaker (NNES) researcher in their disciplinary communities by writing acceptable RAs in English. Writing acceptable English RAs is an arduous task for most L2 graduate students because they have to learn the written norms of RAs in their communities. Much time and effort are needed to acquire the written forms that include a variety of complex elements, such as condensed sentence patterns, organized structures, technical words, high-frequency reporting verbs, and negotiation registers with their senior community members (e.g., journal editors and reviewers, and thesis or dissertation advisors) (Hsieh & Liou, 2008; Hyland, 2007b; Lau, 2004; Lea, 2008; Liou, Yang, & Chang, 2011; Morita & Kobayashi, 2008; Swales, 1990; Swales & Feak, 2000, 2004, 2009). To successfully learn these complex elements of RA written norms, L2 graduate students may need to assign high connectedness values to the development of a NNES-researcher identity that connects them with their disciplinary communities. This connectedness value may reflect L2 graduate students have profound interest in the written norms of English RAs in their disciplinary communities, a strong orientation to integrating into the community, and positive attitudes towards the community. By proposing connectedness value as a construct of identity-based writing motivation, the study hopes to highlight the importance of gaining a social connection with an English-using disciplinary community to motivated L2 RA writing (Hsieh & Liou, 2008; Hyland, 2007b; Lau,

2004; Lea, 2008; Morita & Kobayashi, 2008; Swales, 1990; Swales & Feak, 2004, 2009).

Connectedness value proposed here can also be viewed as a context-specific attainment value. According to Eccles' (2009) refined expectancy-value theory, attainment value reflects subjective values that individuals assign to a given task according to the extent to which task success promotes the development of their desired self at the personal and collective levels. As a context-specific attainment value, connectedness value reflects L2 graduate students' judgment of how RA-writing success promotes the development of an NNES-researcher identity, indicative of a desired self at the personal and collective levels, with an emphasis on the collective level. That is, the NNES-researcher identity demands a personal ability to write English RAs, but also social recognition for legitimate status of the identity. Most of the time, this legitimate identity status is collectively granted by recognized members of the disciplinary communities who endorse the quality of L2 graduate students' RA writing as acceptable to the community (Hyland, 2000; Lea, 2008; Morita & Kobayashi, 2008; Swales, 1990; Swales & Feak, 2000, 2004). Therefore, I argue that connectedness value may be viewed as a context-specific attainment value, with an emphasis on social recognition for an NNES-researcher identity.

Relating identity-based writing motivation to RA-abstract writing ability. The purpose of the study is to propose a motivated L2 trajectory in which L2 graduate students intend to develop a NNES-researcher identity. The study termed this motivated trajectory as identity-based writing motivation, by adopting Eccles' (2009) proposal that calls for integrating expectancy-value theory with the identity-development process. In conclusion, to operationalize identity-based writing motivation, I adopt four motivational beliefs in Eccles (2009) expectancy-value theory, namely, ability self-concept, interest value, utility value, and cost. Moreover, I propose a new

motivational belief, connectedness value, as a context-specific attainment value to replace the original attainment value so as to highlight that this L2 motivation is built upon a process of developing an NNES-researcher identity through the task of writing English RAs acceptable to chosen disciplinary communities.

When defining identity-based writing motivation, I also attempt to specify the writing task. In particular, I hypothesize that this L2 writing motivation can predict L2 graduate students' ability to write English RAs. However, instead of examining L2 students' ability to write the entire RAs, I focus on the ability to write RA-abstracts, which are deemed as a stand-alone miniature of the whole RA where writers are expected to tout the essence and significance of their studies (Hyland, 2000; Swales & Feak, 2009, 2010). This rhetorical feature of RA abstracts requires writers not only to efficiently summarize the essence of their studies for their readers to preview the whole RA, but to skillfully hook the readers by stating the prominent significance of their studies to the fields (Hsieh & Liou, 2008; Hyland, 2000; Lau, 2004; Pho, 2008; Swales & Feak, 2009, 2010). This rhetorical feature of RA abstracts seems to reflect the fundamental feature of RAs, namely, being informative of study design and persuasive of study contribution. Expectedly, a good writer of RA abstracts often demonstrates high writing ability essential to write the whole RA effectively. In this sense, RA abstracts seem to serve as a good starting point to gauge L2 graduate students' RA-writing ability. Therefore, the present study focuses on RA abstracts.

Relating Self-regulatory Writing Strategies to Identity-based Writing Motivation and RA-abstract Writing Ability

This section reviews research on learning strategies with relation to motivation in educational psychology and in L2 learning. Next, research of self-regulatory strategies of cognition, motivation, behavior, and context will be reviewed. Finally, there will be

discussion of studies on L2 writing strategies in general and on L2 RA writing strategies in particular.

Learning strategies and motivation: From learning strategies to self-regulatory learning strategies. Along with motivation, one of the subsequent questions is how motivation will stimulate learning endeavors for achievement. Learning endeavors have often been operationalized as use of learning strategies that signifies how individuals explicitly release their motivational energy in approaching learning achievement (Bruinsma, 2004; Pintrich, & De Groot, 1990; Schwinger et al., 2009; Tzeng & Schmitt, 2008). Particularly from the expectancy-value perspective, motivation effect on learning achievement has been found as being significantly mediated by the use of learning strategies (Bruinsma, 2004; Eccles & Wigfield, 2002; Pintrich, & De Groot, 1990; Pintrich, 2004). Addressing use of learning strategies as a key mediator, Pintrich and his colleagues (Pintrich, Smith, Garcia, & Makeachie, 1991; Vanderstoep & Pintrich, 2003) developed the Motivated Strategies for Learning Questionnaire (MSLQ). The MSLQ encompasses two parts: motivation and learning strategies. The motivation part includes task value, self-efficacy, and intrinsic and extrinsic goals. This inclusion reflects that motivation is a prerequisite for self-regulatory actions of achievement-related tasks. The learning strategies part includes two categories. The first category includes cognitive and meta-cognitive strategies with subscales of *rehearsal, elaboration, organization, critical thinking, and meta-cognitive self-regulation*. The second category includes resource management strategies with subscales of *time and study environment, effort regulation, peer learning, and help seeking*. Wolters, Karabenick and Pintrich (2003) extended the MSLQ to strategies of self-regulation that learners deploy to construct learning goals, and to manage the goal-pursuit by regulating their cognition, motivation, behavior, and context for better goal-achievement in learning. They argued that self-regulatory learning

strategies provide a more comprehensive view on the overall effort and choices that learners make to manage personal and contextual resources during learning.

Self-regulatory learning strategies thus differ from learning strategies that mainly emphasize cognitive or behavioral acts taken in learning, and may better account for how learners activate, alter, and sustain their goal-pursuit to arrive at goal-achievement in learning. They maintained that self-regulation is a key mediator of personal and contextual factors and achievement pursued.

In a more detailed definition of self-regulatory learning, Wolters et al. (2003) adopted the Zimmerman's (2000) model with four sequenced phases: goal-setting, monitoring, control, and regulation. Learners switch back and forth among these phrases during learning. More specifically, when operationalizing self-regulatory learning strategies of college students, Wolters et al.'s (2003) followed the psychology-based tradition defining mental and behavioral acts by a tripartite classification: regulation of cognition, regulation of motivation, and regulation of behavior.

First, regulation of cognition refers to attempts to manage, monitor, and modify their cognition (Pintrich, 2004; Wolters et al., 2003). These attempts are related to cognitive and meta-cognitive activities that provide information for the perceived gap between a learning goal and current progress in the goal-pursuit. For example, one sets a goal of reading for comprehension, monitors the reading process, and decides whether to modify the reading strategy to achieve the goal. Here self-regulatory strategies include goal-setting, monitoring, and deciding. Regulation of cognition also refers to "the actual selection and use of various cognitive strategies for memory, learning, reasoning, problem solving, and thinking" (Pintrich, 2004, p. 393). More specifically, regulation of cognition is related to the following subscales in MSLQ, the cognition subscales of rehearsal, elaboration, organization, the meta-cognition subscale for

planning, monitoring, regulating learning, and the critical-thinking subscale for applying prior knowledge to new situations and to problem-solving.

Second, regulation of motivation refers to control of achievement motivation, such as in Eccles et al.'s (1983) expectancy and value of task, and goal orientations (i.e., purpose for doing task). Regulation of motivation is related to the MSLQ subscales of attributions of performances, intrinsic and extrinsic goals, task value, and self-efficacy (Pintrich, 2004; Wolters et al., 2003).

Finally, regulation of behavior refers to behavior control and help-seeking behavior. In an academic setting, behavior control includes planning and management of domain, time, and effort, while help-seeking behavior involves asking for help from resources in the environment, or from other people through social-interaction. Pintrich (2004) argues that this help-seeking behavior reflects the social nature of learning, which plays a key role in learning settings at universities where college students often approach learning through a network of peers, colleagues, teachers, etc.

Apart from the educational psychology research, motivated use of the learning strategies has also been one of the most popularly-researched areas in L2 learning over the past three decades (Dörnyei, 2005, Manchon, 2008; Tzeng & Schmitt, 2008). In L2 learning strategy research, a wide range of definitions of learning strategies has been proposed. O'Malley and Chamot (1990) defined learning strategies as the given thoughts or behaviors that a learner uses to effectively comprehend, learn, and retain new information. Oxford (1990) regarded L2 learning strategies as particular steps taken by learners to improve their L2 learning outcome or increase the effectiveness of their learning process. Cohen (1998) highlighted that it is the element of choice that qualifies L2 learning as strategic, because learners voluntarily choose to adopt particular strategies deemed more effective when approaching given learning tasks. Cohen (2003) further elaborated that L2 learning strategies are the intentional or

semi-intentional thoughts and behaviors directed by learners with the attempt to improve their L2 knowledge and performance.

This focus on the strategic choices a learner makes for effective L2 learning seems to reflect the self-regulatory nature of strategy use proposed by educational psychologists. For instance, Alexander, Graham, and Harris (1998) identified six attributes of strategies and defined strategies as “procedural, purposeful, effortful, willful, essential, and facilitative in nature” (p. 130). In a similar vein of viewing learning strategies, Weinstein, Husman, and Dierkin (2000) further specified self-regulated learning as “goal-directed, intentionally invoked, and effortful.” In this vein of logic, Tseng, Dörnyei, and Schmitt (2006) incorporated self-regulatory strategies in educational psychology into learning strategy research in L2 learning. Tseng et al. (2006) emphasized the importance of evaluating the effectiveness of L2 strategies from the individual perspective, rather than from the collective perspective. They conceptualized strategic learning of L2 vocabulary and highlighted that it is learners who “exert purposeful effort to select, and then pursue, learning procedures that they believe will increase their individual learning effectiveness.” In other words, it is learners’ “creative efforts” to improve their learning in a given task that qualifies use of learning strategies.

On the other hand, Oxford (2011) does not differentiate L2 learning strategy from self-regulatory learning. Instead, she incorporates the self-regulatory nature into L2 graduate students’ use of learning strategies that she observed to develop her theory of self-regulated L2 learning strategies. She defined *self-regulated L2 learning strategies* as “deliberate, goal-directed attempts to manage and control efforts to learn the L2” (p. 12). Using the idea of deliberate control or automatic processing, Oxford distinguished skills and strategies. That is, L2 learners perform skills automatically without awareness, yet they use strategies deliberately and purposefully for effective learning.

She elaborated that goals for self-regulated L2 learning strategies may be short-term tasks of L2 learning or long-term goals of improving L2 proficiency. Moreover, when defining efforts made for goal-pursuit, she used two terms in different grain size, strategies and tactics. Strategies refer to general plans of action, while tactics refer to specific techniques or approaches L2 learners use for a given task in a particular setting. Taken together, Oxford (2011) featured self-regulated L2 learning strategies as intentionally used for effective learning, and usually demonstrated through various tactics to achieve the learning goals in particular contexts.

Oxford (2011) further proposed a distinction between metastrategies and strategies. Strategies consist of three categories of L2 learning actions: cognitive (to consolidate, elaborate, or transform knowledge of language and culture), affective (to promote positive emotions and beliefs, and to stimulate and sustain motivation for L2 learning) and sociocultural-interactive (to facilitate communication and understanding of social-cultural context). In general, strategies are used to reach learning goals by conducting behavioral or mental acts, and by manipulating the context for effective learning. Meta-strategies are used to control and manage (e.g., to plan, orchestrate, monitor, and evaluate) use of the strategies mentioned above. Meta-strategies consist of three categories, the meta-cognitive, meta-affective, and meta-sociocultural-interactive. Meta-strategies with the functions of “executive-control and management” enable L2 learners to know whether and how to use a particular strategy, and to evaluate whether the strategy is effective. Meta-strategies function well when learners have meta-knowledge about strategies, task, and context. Moreover, Oxford argued meta-cognitive strategies have been largely addressed in L2 strategy research, while meta-affective and meta-sociocultural-interactive strategies remain less explored. These two meta-strategies are essential for L2 attainment that can hardly be achieved without skillful management of affect for L2 learning and effective use of sociocultural context

for L2 learning. By incorporating the above-mentioned six elements of meta-strategies and strategies in L2 learning, Oxford (2011) proposed the strategic self-regulation model of language learning (the SSR Model). Accordingly, self-regulated L2 learning strategies reflect the “whole and multidimensional learner,” rather than just the cognitive or meta-cognitive engagement of the learners (Oxford, 2011, p. 14).

Oxford’s (2011) recent proposal seems to resonate with Wolters et al.’s (2003) classification of self-regulation strategies by the tripartite “psychological functionings” in psychology research, strategies for regulation of cognition, regulation of motivation, and regulation of behavior. On the basis of Wolters et al.’s three dimensions of self-regulatory learning strategies, Oxford’s (2011) work seemingly made two major modifications so as to better describe self-regulatory strategies of L2 learning. First, she proposed the distinction between strategies and meta-strategies. By doing so, she attempted to call for more attention to meta-affective and meta-sociocultural-interactive strategies in L2 research. Although meta-strategies and strategies may be distinguishable at the theoretical level, they are usually used in a combined and recursive way. A clear-cut distinction of these two types of strategies may be less feasible at the empirical level. Second, she specified regulation of behavior as sociocultural-interactive strategies and meta-strategies to emphasize that effective interaction among learner, context, communication, and culture is essential for L2 attainment. With this emphasis, self-regulatory L2 learning strategies may reveal more details about how L2 learners manage and control behavioral and mental acts, contextual resources, and social connection to approach L2 learning effectively.

Aligned with Oxford’s recent proposal, the present study defines the self-regulatory L2 learning strategies as effortful and effective actions that the individuals take to manage and control personal (i.e., behavioral or mental acts) and contextual (i.e., references and others’ help) resources to approach L2 learning

effectively. More specifically, when operationalizing self-regulatory strategies for the L2 RA-abstract writing, the present study synthesizes Oxford's (2011) model of self-regulated L2 learning strategies with Wolters et al.'s (2003) scale of self-regulatory strategies. The study aims to test how self-regulatory RA-abstract writing strategies mediate effect of identity-based writing motivation in predicting RA-abstract writing ability. When describing self-regulatory RA-abstract writing strategies as a mediator of the motivation effect, Wolters et al.'s (2003) scale seems a viable measure that reflects the self-regulatory strategies that individuals adopted for a learning goal with the motivational prerequisite of their expectancy-value beliefs about the learning. Thus, the study will adopt the two scales of Wolters et al.'s subscales: regulation of cognition and regulation of motivation. Instead of directly adopting the third subscale, regulation of behavior (Wolters et al., 2003), the study will adopt Oxford's (2011) recent proposal specifying this subscale as regulation of socio-interactive resources to highlight "the social nature of learning" in L2 attainment (Pintrich, 2004). This social nature of learning can be specified as approaching L2 attainment by effective interaction with context, communication, and culture (Oxford, 2011). To have the effective interaction, regulating socio-interactive resources is one of the most prominent operations for L2 attainment (Oxford, 2011). Taken together, the present study will adopt three subscales of self-regulatory learning strategies, cognition regulation, motivation regulation, and socio-interactive resources regulation, when operationalizing self-regulatory RA-abstract writing strategies.

Research on L2 writing strategies: The nature of L2 writing. The present study adopts the framework of self-regulatory L2 learning strategies (Oxford, 2011), an updating view on L2 learning strategies, in describing strategies for L2 research-article (RA)-abstract writing. Yet, it is of great importance to review research on native language (L1) and L2 writing strategies in general and research on L2 RA writing

strategies in particular, so as to locate major cognitive strategies deemed as effective in promoting L2 writing attainment in literature.

Research of L2 writing strategies has long adopted a “writing process” perspective when describing mental and behavioral acts performed during writing. This perspective mainly follows the cognition-oriented tradition of native language (L1) writing research from the 1980s. From this perspective, writing has been typically defined as a text-generation process in which writers seek to transform their intention into language largely by performing linguistic exercises recursively until a text intended is generated (Bereiter & Scardamalia, 1987; Flower & Hayes, 1980a, 1980b; Scardamalia & Bereiter, 1986). Most writers seek an intended text as a final product of writing that may be specified by varying goals for language, organization, text, or ideas, depending on the requirement of the writing task. Accordingly, the text-generation process is often conceptualized as goal-directed. In this sense, the text-generation process often involves moving from an initial state of a given goal to its end state with varying problem-solution efforts generally defined as writing strategies. In turn, writing strategies have been specified as various problem-solution efforts that writers make to manage and control the goal pursuit at personal and contextual levels (Bereiter & Scardamalia, 1987). At the personal level, writers may choose cognitive or behavioral operations effective of text generation (e.g., development of ideas or improvement of rhetoric), and compensatory to their limited cognitive resources (e.g., simplification of their expressions). At the contextual level, writers may utilize resources in context (e.g., seeking references and other people’s help) so as to facilitate the text-generation process. Since these two-level of strategies are apparently chosen to manage and control goal-pursuit in the text-generation process, they are deemed as self-regulatory in nature (Bereiter & Scardamalia, 1987; Wolters et al., 2003). Taken together, writing strategies can be defined as recursive actions taken to achieve varying goals for

generation of a text intended. Being used for goal-achievement in the text-generation process, writing strategies are further defined as problem-solution efforts that writers decide to make by drawing on personal or contextual resources for the intended text, suggesting that writing strategies are goal-directed and self-regulatory in nature.

Later in the mid-1990s, a socio-constructionist perspective contributed to L1 writing strategy research (Gosden, 1995; Kent, 1999; McComiskey, 2000). This perspective defines writing as a social activity in which writers communicate with their readers mainly through the text composed, and readers interpret the text generally through their prior knowledge about topics in texts, and the writing norms typically practiced in a given discourse community where texts circulate (Gosden, 1995; Kent, 1999; McComiskey, 2000). Taking writing of scientific papers for instance, researchers mainly compose in response to feedback and criticism given by readers in their chosen disciplinary communities, characterizing writing as a social activity (Gosden, 1995, 1996; Shaw, 1991). In this sense, content and rhetorical goals of the text are not only set by the writers' intention, but by reader expectations and writing norms in the discourse community. From the socio-constructionist perspective, writers are expected to meet both the self-initiated and the socially-constructed goals so as to construct an intended text that is expected to effectively address readers' cognition and concern. In this way, writers are more likely to successfully convey their meanings to readers mainly through the text.

Generally following this development in L1 writing research, research of second and foreign language (L2) writing strategies has also addressed L2 composing operations that writers perform to generate, convey, and improve their ideas via an L2. When examining L2 composing operations, researchers also adopted the cognition-driven approach in 1980s and 1990s. To uncover L2 writing strategies (Leki, 1995), L2 researchers compared the use of L2 writing strategies between successful and

less successful writers (Cumming, 1989; Sasaki, 2000, 2002; Zamel, 1982, 1983), and examined whether use of L2 writing strategies is malleable to instruction effort (Chin, 2003; Pflingstag, 1984; Zamel, 1982). Research on use of L2 writing strategies reveals what strategies help L2 writers effectively generate the intended text. Quite a few strategies have been identified as effective in L2 writing, such as the use of self-regulatory strategies that sustain L2 writers in pursuing the goal-achievement in L2 writing (Cumming, 1989, Cumming, Busch, & Zhou, 2002; Leki, 1995), the use of L1 that refines idea-generation, idea-organization, and word choice in L2 writing (Cumming, 2001; Manchon, 2001, 2007; Manchon, Larios, & Murphy, 2007; Leki, 1995), the use of resources in context that compensates L2 writers' limited cognitive capacity and improves their writing accordingly (Cumming, 1989; Cumming et al., 2002; Leki, 1995; Sasaki, 2000).

With abundant L2 writing strategies reported, researchers then focused on the use of L2 writing strategies by successful L2 writers as compared to less successful L2 writers (Raimens, 1985, 1987; Zamel, 1983). Insights were provided into what strategies are effective in promoting L2 writing achievement. For instance, Zamel (1983) examined the text-generation process of six advanced ESL students. She found that successful L2 writers focused on search and generation of ideas rather than language when planning ideas. They tended to revise the discourse (e.g., content and organization) rather than the language (e.g., grammar and vocabulary). In addition, they engaged in text-generation process in a recursive manner, rather than a linear and clear-cut one. That is, they moved back and forth among the three sub-processes of planning, writing, and revising. Raimens (1985) examined the text-generation process of eight less successful ESL college students. The less successful writers were found using fewer idea-generating and revising strategies throughout writing. With a clearer picture on the effectiveness of L2 writing strategies, researchers proceeded to

investigate whether the use of L2 writing strategies is teachable by awareness-raising and actual practice of L2 writing strategies (Chin, 2003; Cohen, 2003; Pflingstag, 1984). Chin (2003) examined whether writing strategies of outlining and revising can promote high L2 writing performance. Chin first investigated fourteen college students' writing ability and use of writing strategy by think-aloud protocol, interview, and questionnaire. Three students were found to use the outlining and revising strategies less frequently, so they received instruction on these two strategies. After the strategy instruction, the three students showed progress in idea generation, organization, and language use. In short, L2 writing strategy research addresses the issue of how the use of effective L2 writing strategies promotes L2 writing achievement, with the hope of advancing the field's understanding on how to equip L2 writers with more effective strategies (Chin, 2003; Pflingstag, 1984; Zamel, 1982, 1983).

Corresponding to the research trends in L1 writing strategy, L2 writing strategy research has shifted from a cognition-driven focus to the socio-constructionist one (Cumming, 2001; Manchon, 2001; Manchon, Larios, & Murphy, 2007). Leki (1995) addressed the socio-constructionist nature of L2 writing by interviewing ESL writers to describe the strategies effective of L2 writing. Moreover, through a socio-constructionist lens, Manchon (2001, p 54) elaborated on Leki's report of effective L2 writing strategies, such as: (a) strategies used to conceptualize and fulfill writing tasks (clarifying and focusing strategies in Leki's term); (b) strategies involving use of previous knowledge and experience (relying on past writing experience, using past ESL training, taking advantage of first language and culture); (c) strategies that make the most use of the social context (using current experience or feedback, looking for models, using current ESL writing training); (d) strategies that help taking a stance towards teachers' demands (either accommodating or resisting such demands); and (e) strategies for finding ways of managing and regulating the demands of their courses

and assignments (e.g., demands for time and effort). Cumming et al.'s (2002) categorized L2 writing strategy categories into: (1) seeking assistance from other people (peers, teachers, tutors, etc); (2) self-regulation (planning prior to writing, editing, revising); (3) stimulation (talking to people); (4) use of tools (books, magazines, dictionaries, computers, etc); and (5) language practice. Another example can be seen from genre-based models that consider not only how L2 writing is composed through cognitive and behavioral operations, but how L2 writing goals and rhetorical norms are shaped by sociocultural contexts (Hyland, 2003). From the three studies mentioned above, the nature of L2 writing is viewed as being largely shaped by context that specifies the writing goals (e.g., writing purposes and norms acceptable to a given audience) and offers choices of the goal-pursuit for L2 writers. To secure the ultimate goal-achievement, goal-pursuit in L2 writing often demands that writers manage and control the goal-pursuit by self-regulatory efforts. Self-regulatory efforts for L2 writing may be observed from L2 writers' regulation of personal cognition, motivation, and behavior for L2 writing, as well as regulation of contextual references or other people's help and collaboration so as to achieve goals in L2 writing.

Despite abundant studies on L2 writing strategies to date, a consensus on how to define 'strategy' has yet to be reached (Manchon, 2001; Manchon et al., 2007). L2 researchers have adopted a wide range of terms interchangeably when addressing L2 writing strategies, such as 'writing behaviors' (Whalen, 1993), 'composing operations' (Armengol-Castells, 2001), 'strategies and behaviors of L2 writers' (Zamel, 1983), 'writing techniques and procedures' (Khaldieh, 2000), 'strategies as sub-processes of writing' (Feng, 2001), and 'writing-process strategies' (Sasaki, 2004). Among these definitions of L2 writing strategies, some researchers attempted to categorize composing operations in a hierarchical order by first dividing the text-generation procedure into three processes (e.g., planning, composing, and revision), and then by

elaborating on acts performed within each process as strategies. However, not all L2 researchers adopt this hierarchy-embedded definition. Consequently, definitions of L2 writing strategies remain less consistent in literature, making the concept ‘strategy’ elusive and slippery at the cross-study level.

To clarify this concept for advancing L2 writing strategy research, Manchon et al., (2007) called for a unified definition of ‘strategy.’ First, they categorized the writing actions as: (a) general writing processes with three stages-- planning, composing, and revising, and (b) specific writing actions, such as ‘avoidance’ (Olsen, 1999), ‘backtracking’ (Manchon, Roca de Larios, & Murphy, 2000), ‘rhetorical refining’ (Sasaki, 2002, 2004), or ‘use of models’ (Zhu, 2004). The specific writing actions are sometimes mapped onto the three general writing processes, such as planning (organizing, goal-setting), composing (rehearsing, formulating, translating), and revising (re-reading, evaluating, and editing) (Bloom, 2008; Feng, 2001; Sasaki, 2000). More specifically, Petrić and Czarl (2003) demonstrated this mapping when developing a questionnaire of L2 writing strategy. However, this mapping may not always represent the actual writing actions adopted because writers tend to recursively undertake the three proposed processes and to repeatedly use specific actions. That is, writing is “a cyclical process during which writers move back and forth on a continuum discovering, analyzing, and synthesizing ideas,” according to Hughey, Wormuth, Hartfiedl, and Jacobs (1983) (cited in Raimes, 1985, p. 230). Therefore, instead of drawing a clear-cut distinction of the three writing processes, L2 writing strategies are sometimes defined by a holistic text-generation process where L2 writers perform mental and behavioral acts recursively to meet the writing goals of generating an intended text (Hughey et al., 1983; Flowerdew, 1999a, 1999b; Okamura, 2006). The present study adopts this definition.

Research on L2 research-article writing strategies. Following the convention of characterizing L2 writing as a problem-solution process in L2 writing strategy research, studies of L2 writing strategies for research articles (RA) have addressed two major issues, usually in a sequenced manner during L2 writers' RA writing: (a) problems that L2 writers encountered when writing RAs (Flowerdew, 1999a, 1999b; Huang, 2010; Gosden, 1995; Shaw, 1991), and then (b) strategies that L2 writers used with the attempt of solving the problems identified (Flowerdew, 2000; Okamura, 2006; Shaw, 1991). The L2 writers' problems in composing RAs have often been described from a socio-constructionist perspective. For instance, Gosden (1995) described the writing and revision of RAs for publication. To reveal how RAs were revised from being problematic to publishable in academia, he analyzed seven non-native-English-speaking (NNES) novice researchers' first and final RA drafts in English for linguistic resources refined. This refinement was interpreted mainly for three rhetorical functions: the author's interpretation of the subject matter (ideational), the concern of the audience's needs and knowledge base (interpersonal), and the selection of the text-structure (textual). The three identified functions showed how RA writing were problematized and revised through the interaction between novice RA writers and expert RA readers, suggesting most writing norms of RAs for publication were socially constructed.

With a similar view of the socially-constructed RA norms, Shaw (1991) interviewed 22 NNES doctoral students for problems encountered and strategies adopted during their writing of dissertations in English, rather than RAs in English for publication. By focusing on dissertation writing, Shaw specified the immediate learning environment (e.g., Ph.D. program) and the discourse community (e.g., supervisor and colleagues in the Ph.D. program). Strategies were identified under six categories: (a) relation to community (e.g., supervisor's influence on topic choice and reading of other

dissertations as writing models), (b) the first language (e.g., use of L2 instead of L1 for idea generation so as to discuss with their colleagues about the problems encountered), (c) development of the L2 code (e.g., collecting useful phrases from source texts; adopting text structure from another dissertation; using bilingual dictionary to locate words on the tip of the tongue), (d) learning of the genre rules (e.g., achieving conformity to the genre rules by examining the models; writing ideas in their words and adapting the paragraph pattern), (e) the composing process (e.g., planning and writing simultaneously and recursively; leaving the text fallow for a short time; writing three drafts at least; submitting the second draft to the supervisors to have feedback on reorganizing and editing of the English), and (f) contrastive rhetoric (no rhetorical problems are recognized).

In line with the social-constructionist lens, Flowerdew (1999a) used a large-scale survey (N =585) to describe the writing process that Hong Kong Chinese researchers (e.g., graduate students and faculty members at university) undertake in writing English RAs for publication. During this writing process, Flowerdew (1999a) reported over two-thirds of NNES researchers (68%) felt that they were at a disadvantage. More specifically, the NNES researchers felt they had technical problems of language use (51%), and prejudice (29%) held by referees and editors against NNES researchers. To detail the problems of language use, Flowerdew (1999b) interviewed twenty-six faculty members in the fields of science and social science (i.e., 4 lecturers, 15 assistant professors, 5 associate professors, 2 professors). The problems included: (a) they had less facility of expression; (b) it took them longer to write; (c) they had a less rich vocabulary; (d) they found it difficult to make claims for their research with the appropriate amount of force; (e) their process of composition was influenced by their L1; (f) qualitative articles were more problematic than quantitative articles; (g) they were restricted to a simple style; (h) and the instructions and discussions to scholarly

articles were particularly problematic parts.

With a similar focus on NNES-researchers' problems of language use in writing English RAs for publication, Okamura (2006) detailed strategies adopted. Okamura interviewed 13 Japanese researchers with varying professional experiences (i.e., 5 juniors, 5 middle-ranking, and 3 established) in a non-English-speaking context. In such a linguistically under-privileged context, Okamura first described the differences among the three types of researchers, and highlighted difficulties in English RA writing encountered and the coping strategies adopted. First, awareness of the audience distinguished established researchers from the others. That is, established researchers considered what impact their writing will bring to a targeted audience, and they tailored their word choice to the impact intended. Meanwhile, middle-ranking researchers (i.e., lecturers and associate professors) and junior researchers showed less concern about the writing impact and the corresponding word-choice. Second, coping strategies for writing difficulties also clearly distinguished the researchers. The strategies generally fell into two sets, "subject knowledge-oriented" strategies and "language-oriented" strategies. The subject knowledge-oriented strategies referred to intensive reading of the published RAs in the field to learn chunked phrases and sentences patterns, and to adopt the phrases and patterns in their own writing. The language-oriented strategies referred to learning subtle differences in English expressions from English texts or from interaction with English-native-speakers so as to gain a native-like sensitivity of the English language. In the early stage of a researcher career, the subject knowledge-oriented strategies seem to provide a possible way for a junior researcher to succeed in publishing with limited English-writing ability. In the more sophisticated stages of a research career, the language-oriented strategies empower the Japanese researchers to write better English RAs by bringing a more profound impact to a target audience through more effective use of the English language.

To recap, research on L2 writing strategies for research articles (RA) has identified a rich repertoire of L2 RA writing strategies through questionnaires and interviews. The research has also specified the effectiveness of some strategies that successful NNES RA writers use more than their less successful counterpart. However, successful NNES RA writers were often defined by a state of attainment that NNES researchers had made in writing English RAs. Apparently, this research agenda described the link between English RA writing attainment and use of effective writing strategies in a relatively static manner. Little is known about the developmental trajectory in which NNES researchers make attempts to write better English RAs by deploying varying strategies perceived as effective. To bridge this gap in literature, the present study aims to examine a developmental trajectory in which NNES researchers (i.e., L2 graduate students) use varying writing strategies to write better RAs.

The self-regulatory research-article-abstract writing strategies. On the basis of the effective L2 RA writing strategies identified (Flowerdew, 1999b; Okamura, 2006; Shaw, 1991), the present study attempts to go a step further by incorporating self-regulatory strategies into these writing strategies, when defining L2 writing strategies of RAs. This incorporation is due to two reasons. First, the use of writing strategies has been well-recognized as goal-directed and self-regulatory in nature (Bereiter & Scardamalia, 1987; Cumming, 1989, 2001; Oxford, 2011). Particularly for L2 writing, L2 writers often pursue the goal of generating an intended text as a final state by conducting both information-processing acts of writing and executive and control acts to ensure the writing acts sustained and successful (Cumming, 1989, 2001; Oxford, 2011). Second, self-regulatory learning strategies provide a comprehensive view of the overall effort and choices that learners make at personal and contextual levels during learning (Oxford, 2011; Pintrich, 2004; Wolters et al., 2003). Therefore, in this study, L2 RA writing strategies are defined as self-regulatory strategies that L2

graduate students deploy for adaptation and selection of cognitive, motivational, and context-control strategies. It is expected that describing L2 RA writing strategies in this way can better account for how L2 graduate students activate, alter, and sustain their goal-pursuit in writing English RAs. It can also better predict the degree to which they arrive at the goal-achievement in writing English RAs, as compared to sole description of writing strategies that mainly focus on cognitive and metacognitive operations conducted in writing.

Taken together, the study synthesized findings from research on L2 RA writing strategies, L2 writing strategies, language learning strategies, and self-regulatory learning strategies, in order to operationalize self-regulatory writing strategies. In particular, the present study adopted three subscales for assessing the self-regulatory writing strategies, including cognition regulation, motivation regulation, and social-interactive resources regulation. More importantly, when operationalizing self-regulatory writing strategies, the study does not focus on the whole RAs. Instead, the study only addresses the section of abstract that is well-recognized as a miniature of the whole RAs, and expected to present the essence and significance of the RA. As a result, L2 graduate students' use of self-regulatory writing strategies and their RA-abstract writing ability can be better described. In turn, this specification may offer a more in-depth picture of the degree to which use of the self-regulatory writing strategies mediates the effect of identity-based writing motivation in explaining RA-abstract writing ability of L2 graduate students.

Relating L2 literacy to Identity-based Writing Motivation, Self-regulatory Writing Strategies, and RA-abstract Writing Ability

When investigating the effect of the identity-based writing motivation on L2 graduate students' RA-abstracts writing, the motivational covariates also need to be

considered, such as societal behaviors and beliefs (Jones, 2008), and past learning experiences (Jones, 2008; Liem, Lau, & Nie, 2008; Pokay & Bluenfeld, 1990; Schwinger, Steinmayr, & Spinath, 2009). Among these covariates, past experiences of English learning may affect how L2 students cognitively and affectively interpret their past experiences of English learning, which in turn affects their motivation for their future learning of English (Dörnyei, 2005, 2009; Gardner, 2007; Kormos & Csizér, 2008).

More elaborations of the importance of past learning experiences to success in L2 learning are provided by Dörnyei's (2005) "L2 Motivation Self System." The L2 Motivation Self System is composed of three elements, namely, Ideal L2 Self, Ought-to-L2 Self, and L2 Learning Experience, as reviewed earlier (the section *Specifying L2 graduate students' connectedness value for their identity-based writing motivation*). Ideal L2 Self refers to one's ideal identity who can speak an L2 fluently in the future, and it will motivate one to launch motivated L2 learning. Ought-to-L2 Self refers to personal characteristics that one believes one must possess to prevent negative outcomes in the future. Finally, L2 Learning Experience is related to one's experiences of situated L2 learning that involves key factors of the teacher, the curriculum, and the experience of L2 learning success (Dörnyei, 2005). L2 Learning Experience is conceptualized as highly predictive of Ideal L2 Self, although this conceptualization has yet to be tested empirically (Dörnyei, 2005; Kormos & Csizér, 2008).

Conceptually, this predictability of L2 learning experience on Ideal L2 Self apparently confirms Oyserman et al's' (2002) identity-based motivation theory in the educational psychology field. That is, individuals can be motivated to learn when guided to build their future identities upon their past success and failure in learning. Past success or failure in learning enables individuals to better learn their own dispositions and abilities, so that they may regulate future learning more effectively by

exploiting their strengths and compromising their weaknesses (Dörnyei, 2009; Oyserman et al.'s., 2002; Oyserman & Destin, 2010). As a motivational covariate, past learning experiences are often operationalized by an index of ability, such as marks in the previous academic year (Bruisma, 2004; Liem et al., 2008; Pokay & Blumenfeld, 1990).

Even though proficiency in a given subject is commonly believed as a key covariate alongside motivation in predicting learning achievement in the fields of educational psychology (Eccles, 2009; Jussim, 1989; Jussim & Eccles 1992; Oyserman & Destin, 2002, 2010) and L2 learning (Dörnyei, 2005, 2009; Kormos & Csizér, 2008), the amount of L2 research that empirically tests this belief remains small. In structural equation modeling analysis, Yashima (2002) partly addressed this belief. She indicated that English proficiency (i.e., the TOEFL score) did not significantly predict L2 communicative confidence ($\beta=.14$, *ns.*) that was operationalized by communication anxiety and perceived communicative competence in L2. This non-significant prediction was attributed to the fissure between the TOEFL scores that served as a standardized proficiency test largely academic in nature, and L2 communicative confidence that pertained to psychological appraisals in face-to-face interactions (Yashima, 2002). This fissure may partially account for why English proficiency was less predictive of L2 communicative confidence. Moreover, in Yashima's model, English proficiency was an endogenous factor that served as one of the critical mediators between international posture (attitudes towards L2 learning) and L2 willingness to communicate, rather an exogenous factor that initiates the proposed motivated L2 learning trajectory. In fact, she proposed that international posture, as the exogenous factor, predicted L2 learners' willingness to communicate indirectly via the paths from L2 motivation (operationalized as motivation intensity and desire to learn L2), via L2 proficiency, to L2 communicative confidence.

Apparently, previous L2 motivation research has often operationalized L2 proficiency as an outcome of motivated L2 learning in general, and has substantiated the direct and indirect effects of L2 motivation on L2 proficiency (Gardner, Tremblay, & Masgoret, 1997; Yashima, 2002; Yashima & Zenuk-Nishide, 2008). On the other hand, a paucity of L2 motivation research has operationalized L2 proficiency as a covariate when examining a direct motivation effect on L2 ability. However conceptually, past learning experiences (e.g., L2 proficiency) have been increasingly recognized as one of the key covariates for L2 motivation, as can be seen in Dörnyei's (2005, 2009) L2 Motivation Self System. Empirically, this research trend suggests that L2 proficiency has yet to be sufficiently operationalized as a covariate alongside L2 motivation when modeling the development in a rather specific L2 ability, such as reading or writing for academic purposes. To bridge this empirical gap, the present study aims to investigate whether L2 literacy as a covariate can effectively explain development in RA-abstract writing ability, alongside the direct motivation and strategy effects on the ability. This investigation on a specific L2 ability also attempts to respond to Dörnyei's (2005) call that L2 motivation should be contextualized into a specific task so as to shed more pedagogical light.

Moreover, when targeting such specific L2 ability (i.e., RA-abstract writing ability), L2 proficiency is specified as L2 literacy of reading and writing abilities in the study, rather than a less-specified general proficiency that previous L2 writing studies have operationalized as grammar and vocabulary knowledge (Lu, 2010; Schoonen et al., 2003), or oral skills (Cumming, 1989). With such specification of L2 literacy as a covariate, the study hopes to model the L2 literacy effect on RA-abstract writing in a more adequate manner. That is, it is assumed that such a specified covariate (i.e., L2 literacy in contrast to L2 proficiency) could explain a more adequate amount of

variance of the RA-abstract writing ability, and thereby advance our understanding of what constitutes a high RA-abstract writing ability.

In this sense, the present study aims to test to which degree L2 literacy can affect the RA-abstract writing ability, alongside the direct motivation and strategy effects under the conceptual framework of the expectancy-value theory. Such framework has been commonly adopted in educational psychology research, and has helped identify prior performance as a strong covariate for achievement alongside direct motivation and strategy effects (Bruisma, 2004; Jones, 2008; Kyttälä & Björn, 2010; Pokay & Blumenfeld, 1990). However, these findings of the strong covariate effect on achievement may not be entirely applicable to the present study because there were apparent differences in outcome ability (e.g., a general ability of math at secondary-school students in Kyttälä & Björn (2010) versus a specific ability of RA-abstract writing in the present study).

Despite these differences, these previous studies lay an empirical foundation for adding a covariate of prior performance to the motivated learning model following the expectancy-value theory, partially justifying the inclusion of L2 literacy as a covariate to the motivated abstract-writing model (the MAW model). Besides the relation with L2 writing motivation, L2 proficiency has been found to be correlated to L2 writing performance with mixed results, when L1 writing ability was investigated (Cumming, 1989; Lu, 2010; Sasaki & Hirose, 1996; Schoonen, Van Gelderen, De Glopper, Hulstijn, Simis, Snellings & Stevenson 2003; Zare-ee, 2011). On the one hand, Cumming (1989) and Schoonen et al. (2003) revealed that L1 writing ability was more predictive of L2 writing performance than L2 proficiency. On the other hand, Sasaki and Hirose (1996) and Yun (2005) indicated that L2 proficiency is more predictive of L2 writing performance than L1 writing ability. In particular, Cumming (1989) indicated L2

proficiency (measured by oral interviews of the university ESL faculty) usually affects the quality of L2 writing, despite being a non-significant predictor for the writing quality in his study. Cumming operationalized L2 proficiency as oral proficiency, rather than proficiency in L2 reading or writing that may share more common constructs with L2 essay-writing ability. This operationalization may contribute to the relatively lower predictability of L2 proficiency on L2 writing performance, as compared to L1 writing ability. Schoonen et al. (2003) operationalized L2 proficiency as vocabulary, orthography, and grammar, when targeting participants of Dutch L1 learners at Grade 8. They also found that L2 proficiency was less predictive of their L2 writing performance, as compared to L1 writing ability.

In contrast, Sasaki and Hirose (1996) stated that Japanese learners' L1 writing ability (measured by a L1 essay) was less predictive of their L2 English writing performance, as compared to L2 proficiency (measured by structure, listening, and vocabulary). In their multiple regression analysis, L1 writing ability only explained 18.3% of the variance in L2 writing performance, while L2 proficiency explained 52.1%. Moreover, when unique explanatory power of these two factors was examined, L2 proficiency was reported to be more predictive than L1 writing ability, 32.6% vs. 1.5% respectively. Likewise, L2 researchers have corroborated Sasaki and Hirose's (1996) finding by a correlational approach (Zare-ee, 2011), by a structural equation modeling approach (Yun, 2005), and by a multiple regression approach (Lu, 2010).

First, Zare-ee (2011) focused on 140 L2 college students majoring in English in Iran, and found a moderate significant correlation ($r=.42$) between L2 proficiency (measured by grammar, vocabulary, and reading comprehension) and L2 writing ability (measured by writing a letter of job application). Second, Yun (2005) reported that Korean learners' L2 proficiency was more predictive of L2 writing performance, as

compared to their L1 writing ability, in structural equation modeling analysis. Finally, in line with this research agenda, Lu (2010) examined how cognitive factors affect L2 learners' writing. She defined cognitive factors as L2 proficiency, L1 writing ability, genre knowledge, use of L2 writing strategies, and working memory capacity in L1 and L2. Multiple regression analysis revealed that English proficiency ($\beta=.365$) predicted L2 writing most, followed by genre knowledge ($\beta=.197$), and use of L2 writing strategies ($\beta=.168$); L1 writing ability ($\beta=.066$) and working memory capacity ($\beta=.053$) had less predicting power for L2 writing. In total, these five factors explained 30.6 percent of the variance in L2 writing.

On the basis of these findings, L2 proficiency apparently plays a key role in predicting L2 writing ability, if L2 proficiency is measured by informative indicators that are highly related to the writing ability in question, such as grammar, vocabulary, and reading comprehension. Specifically, the previous studies pinpointed an outcome of L2 writing in general (Lu, 2010; Sasaki & Hirose, 1996; Zare-ee, 2011), seemingly justifying their operationalization of L2 proficiency covariate as grammar, vocabulary, and reading that were found as effective predictors of L2 writing. Meanwhile, the present study pinpoints RA-abstract writing in particular, and will operationalize an indicator of its covariate as L2 reading ability. However, instead of operationalizing the other indicator as vocabulary and grammar, the study will operationalize it as L2 writing ability. By doing so, it is hoped to strengthen the relations between the covariate and the RA-abstract writing ability in question. Since the the covariate here is operationalized as L2 reading and writing abilities, it is termed as L2 literacy (rather than L2 proficiency) in an effort to better characterize the nature of such a covariate.

Taken together, it was hypothesized that L2 literacy serves as an effective covariate exerting a direct effect on the RA-abstract writing ability of L2 graduate students, although this direct effect is of less focus for the study. This covariate effect

was specified and then controlled statistically. The covariate effect may be rather effective in explaining a relatively large part of the systemic variance in the RA-abstract writing ability. With this covariate effect, it is more likely to make a better estimate on the relative importance of identity-based writing motivation and self-regulatory writing strategies in the writing ability. In particular, this estimate was tested by two hypothesized direct effects. That is, with L2 literacy controlled, two direct effects were hypothesized: (a) a direct effect of identity-based writing motivation on the RA-abstract writing ability, and (b) a direct effect of self-regulatory writing strategy on the writing ability. In addition, there is a hypothesized indirect effect of identity-based writing motivation on writing ability via strategy.

Hypothetically, with L2 literacy as a covariate, it is of greater possibility to make the MAW model more adequate in characterizing the relative importance of identity-based writing motivation and self-regulatory writing strategy in L2 graduate students' RA-abstract writing ability.

CHAPTER THREE METHOD

The chapter describes the proposed model that characterizes the role of identity-based writing motivation and self-regulatory writing strategies in explaining L2 graduate students' RA-abstract writing ability with L2 literacy serving as a covariate. The chapter also details research procedure, participants, measures, and the structural equation modeling approach.

The Proposed Model

The present study aimed to investigate the role of identity-based writing motivation and the self-regulatory writing strategies in explaining L2 graduate students' RA-abstract writing ability with L2 literacy serving as a covariate. Figure 1 shows the proposed model in the present study. By testing this proposed model, the aim was to achieve a better understanding of the interplay between cognitive factors (e.g., L2 literacy, use of self-regulatory writing strategies) and affective factor (i.e., identity-based writing motivation), in explaining L2 graduate students' RA-abstract writing ability.

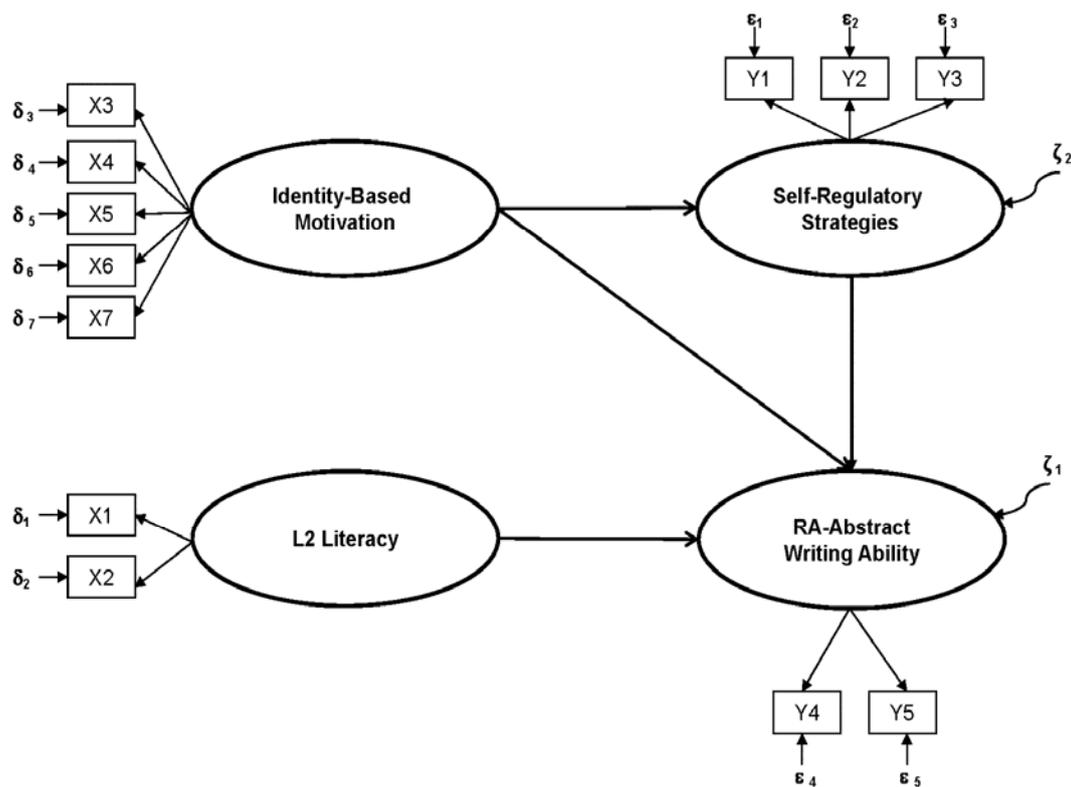


Figure 1. The motivated abstract-writing model (the MAW model). The model presents 4 latent variables and 12 observed variables (X_1 =reading ability, X_2 = writing ability; X_3 =interest value, X_4 =utility value, X_5 =cost, X_6 =connectedness value, X_7 =ability self-concept; Y_1 =cognition regulation, Y_2 =motivation regulation, Y_3 = socio-interactive resources regulation; Y_4 = global move, Y_5 = local pattern.).

Research Procedure

There are four phases involved in the research procedure of the present study, including phases of preparation, pilot studies, formal study, and evaluation. The four-phased research procedure is shown in Table 1.

Table 1
Research Procedure

| Phase | Research steps |
|--|---|
| 1. Preparation | <p>Review Literature.</p> <ul style="list-style-type: none"> •Specify research purposes. •Propose a model of motivated abstract-writing (the MAW model). •Determine data collection methods. •Conceptualize the motivational constructs on the basis of identity-based motivation theory, expectancy-value theory, socio-educational theory, and genre theory. <p>Consult Experts and Compile Measures.</p> <ul style="list-style-type: none"> •Consult experts in the fields of educational psychology and L2 learning to ensure the motivational constructs could be assessed by item measures. •Draft demographics questionnaire, Identity-based Writing Motivation Inventory (IWMI), and Self-regulatory Writing Strategy Inventory (SWSI) in English and translate the questionnaire items into Chinese. •Consult experts in the field of L2 research-article writing to ensure the genre theory could be applied to development of the two rating scales of RA-abstract writing. •Draft Research-Abstract Performance Assessment by two parts, First, draft a prompt in Chinese (participants' L1) for a timed RA-abstract writing task on the basis of an empirical research article in applied linguistics; it was written in Chinese. Second, draft two rating scales for the RA-abstract writing task, including a global move scale and a local pattern scale. •Compile an L2 literacy test by 20 multiple-choice items for reading comprehension and a timed essay test for writing ability. These test items were taken from the retired items in the advanced level of General English Proficiency Test (the GEPT-advanced). |
| 2. Pilot study & Measures development | <p>Examine the Psychometric Properties of IWMI and SWSI.</p> <ul style="list-style-type: none"> • Interview a focus group of 2 doctoral students from the fields of education and business to ensure the appropriateness of item wording and range in IWMI and SWSI. •Back-translate the inventories from Chinese to English to make the wording clear and precise. |

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- Consult 2 experts in the fields of educational psychology and L2 learning (i.e., holding a Ph.D. in the respective field) to ensure the clarity and appropriateness of the two inventories.
 - Revise IWMI and SWSI for a subsequent pilot test.
 - Administer the two inventories to 255 graduate students in the fields of education and business in the pilot study.
 - Analyze the data collected from the pilot study by item analysis, internal consistency, and confirmatory factor analysis (CFA).
 - Establish preliminary validity for the two inventories.

Establish Feasibility of Research-Abstract Performance Assessment.

- Pilot the RA-Abstract Writing Test to 5 graduate students in applied linguistics.
- Interview the 5 graduate students to ensure that the prompt was clearly worded, and the test was accomplishable within the time limit.
- Develop the two rating scales of the writing task via two stages:
- In advisor-guiding stage, the two advisors guided the researcher through drafting of the two rating scales.
- In expert-reviewing stage, 3 professors in applied linguistics reviewed the rating scales via semi-structured interviews and ensuing emails. The three experts were invited in sequence; i.e., one at a time to approach the following questions :
 - Whether and how can the rating scales assess L2 graduate students' ability to write an RA-abstract?
 - Should the scores be weighted?
 - How should the wording and criteria of the scale descriptions be presented?

3.
Formal
study

Conduct the study.

- Recruit 185 graduate students (both master's and doctoral students) in applied linguistics.
 - Administer the measures in sequence, i.e., the RA-abstract writing task, the L2 literacy test, and finally the questionnaire set (i.e., demographics questionnaire, IWMI, and SWSI). Specifically, administer the RA-abstract writing task and the L2 literacy test in a counter-balanced manner. Half of the participants took the RA-abstract writing task and then the L2 literacy test, whereas the other took the L2 literacy test and then the RA-abstract writing task.
-

| | |
|------------------|--|
| 4. Evaluation | <p>Analyze data.</p> <ul style="list-style-type: none"> •Analyze background questionnaire, IWMI and SWSI. •Analyze the L2 literacy test: reading and writing tasks. •Specifically, for the writing task: <ul style="list-style-type: none"> Recruit two raters. Hold a rater training session. The two raters rate independently. Evaluate the inter-rater reliability. •Analyze the RA-abstract writing task. <ul style="list-style-type: none"> Recruit two raters. Hold a rater-training session. The two raters rate independently. Evaluate the inter-rater reliability. •Evaluate the proposed model via the structural equation modeling approach <ul style="list-style-type: none"> Analyze correlations among the 12 observed variables. Analyze correlations among the 4 latent variables. By Anderson and Gerbing's (1988) 2-step rule, test the measurement model and the structural model. Further test the measurement model on its construct validity. <ul style="list-style-type: none"> (1) The measurement model (confirmatory factor analysis (CFA). <ul style="list-style-type: none"> Report the hypothesized model and the modified model by goodness-of-fit indices. Report correlations between the latent variables. (2)Construct validity testing. <ul style="list-style-type: none"> Report factor loadings and error variances. Calculate composite reliability for convergent validity. Calculate the Average Variance Extracted (AVE) estimate for convergent validity. Compare the AVE with the squared correlations of the four latent variables for discriminant validity. (3) The structural model. <ul style="list-style-type: none"> Report goodness-of-fit indices. |
|------------------|--|

Report factor loadings and error variances.

Report regression coefficients.

In the preparation phase, important studies were reviewed and evaluated to propose a model of motivated abstract-writing, and to determine the data-collection methods. Then, a number of measures were drafted, including the demographics questionnaire, Identity-based Writing Motivation Inventory (IWMI), Self-regulatory Writing Strategy Inventory (SWSI), and Research-Abstract Performance Assessment (RAPA) that subsumes a prompt of RA-abstract writing task and two corresponding rating scales. Also, an English literacy test was taken from the retired items of General English Proficiency Test-advanced (GEPT), including 20 multiple-choice items for reading ability, and a timed essay test for writing ability.

In the phase of pilot studies, the measures were further revised, and the criteria designed for the rating scales of the RA-abstract writing were established. The measure revision was based on the content validity of IWMI and SWSI (see Appendix A for the demographics questionnaire, IWMI, and SWSI). In particular, the content validity of the two inventories was initially established by a few steps, including an interview of a focus group (IWMI and SWSI), backtranslation, and expert-consultation.

Also in the phase of pilot study, IWMI and SWSI were administered to 255 graduate students in the fields of education and business. Data in the pilot study was analyzed by item analysis, internal consistency, and confirmatory factor analysis. Likewise, the RA-abstract writing task was administered to 5 graduate students in the field of applied linguistics. After the task, a series of follow-up interviews were conducted with the 5 graduate students to ensure that the writing task was clearly worded and accomplishable within the time limit. The criteria designed for the rating scales of the writing task were developed by two stages (the advisor-guiding and the expert-reviewing stages). Details regarding how to develop the rating scales will be

further discussed in the section entitled *Measures*.

In the phase of the formal study, 185 graduate students in applied linguistics (i.e., both master's and doctoral students) were recruited. Before the study began, the graduate students had signed up the consent form (see Appendix B) to demonstrate their agreement to participate in the study. The participants took the measures in sequence, including the RA-abstract writing task (60 minutes), then the L2 literacy test (55 minutes), and finally a questionnaire set (15 minutes) that includes demographics information, Identity-based Writing Motivation Inventory (IWMI), and Self-regulatory Writing Strategies Inventory (SWSI). The RA-abstract writing task and the L2 literacy test were administered in a counterbalanced design. That is, half of the participants took the RA-abstract writing task, and then the L2 literacy test. The other took the L2 literacy test, and then the RA-abstract writing task.

Finally, in the evaluation phase, questionnaires, the L2 literacy test, and the RA-abstract writing task were analyzed, and the structural equation modeling (SEM) approach was applied to data analysis. First, all questionnaires were coded and computed to reveal participants' profiles of demographics, identity-based writing motivation, and use of self-regulatory writing strategies. Second, the L2 literacy test (i.e., reading and writing tasks) and the RA-abstract writing task were scored to show participants' performances in this ability domain. Specifically, the writing task of the L2 literacy test was rated by a few steps: recruiting two raters, holding a rater-training session, rating, evaluating the inter-rater reliability (see more details in *Rating of the GEPT-advanced writing*). Likewise, the RA-abstract writing task was rated by the similar steps: recruiting two raters, holding a rater-training session, rating, evaluating the inter-rater reliability (see more details in *Rating procedure of the RA-abstracts*).

With the data of the questionnaires, the L2 literacy test, and the RA-abstract writing task, the SEM analysis was applied. In SEM analysis, the present study

examined the compatibility of the hypothesized model with the collected data. Specifically, the present study followed Anderson and Gerbing's (1988) two-step rule of measurement model and structural model, and further tested the measurement model by its construct validity. First, the measurement model was examined by goodness-of-fit indices (i.e., primary information on how well the proposed 4 latent variables could be represented by 12 observed variables) and by the correlations among the four latent variables. Furthermore, the measurement model was tested by its construct validity (i.e., convergent and divergent validity). The structural model was examined by goodness-of-fit indices and regression coefficients. Specifically, the regression coefficients were used to test the hypothesized interrelations among the 4 latent variables.

The four-phased research procedure presents an overview of the research steps taken in the present study. Details on the participants, measures (i.e., the L2 literacy test, questionnaires, RAPA, and the SEM approach) will be described below.

Participants

Two studies were conducted, the pilot study and the formal study, involving two groups of participants.

The Pilot Study

The pilot study was conducted to finalize the identity-based writing motivation inventory (IWMI) and the self-regulatory writing strategy inventory (SWSI). The pilot study recruited 255 Taiwanese doctoral students in the fields of education and business. There were two reasons to involve graduate students from a variety of academic fields: concerns of practicality. The concerns of practicality stemmed from the limited number

of graduate students in the field of applied linguistics. It was less likely to find two groups of a large number of graduate students in applied linguistics (i.e., 100 to 200 students to participate in the pilot and formal studies respectively). In order to ensure to get enough graduate students in applied linguistics to participate in the formal study, graduate students from different academic fields were recruited for the pilot study. Specifically, the participants in the pilot study were recruited from the fields of business and education, which fall into the category of social sciences, like the field of applied linguistics. In particular, the participants in the pilot study were doctoral students in the fields of education and business. Doctoral students were chosen because they had more experiences in writing abstracts of research articles including abstracts of thesis, abstracts of journal articles, and abstracts of conference proceedings. Moreover, the two questionnaires were drafted not only by locating questionnaire items in related literature but also by interviewing two doctoral students in the fields of education and business respectively to reveal their motivation and strategies for RA-abstract writing.

In the pilot study, the participants majoring in education were recruited mainly from National Taiwan Normal University (NTNU, n=121, 47.5% of the 255 participants in total). There were two reasons for choosing this university. First, the university specializes in training pre-service teachers, and most graduate programs at NTNU were education-oriented, making most doctoral students at NTNU education majors. Second, NTNU was the researcher's own university. The researcher had more access to participant recruitment, with the help either from individual doctoral students or from faculty members at the university. Additional doctoral students majoring in education at other universities (such as National Cheng Kung University, Taipei Municipal University of Education, n=19, 7.5% of the 255 participants in the pilot study) were recruited as well. The doctoral education majors totaled 140, accounting for 55 % of the 255 participants in the pilot study.

The participants majoring in business were recruited from National Taiwan University (n=75, 29.4% of the 255 participants in the pilot study) and National Cheng-Chi University (n=40, 15.6% of the 255 participants in the pilot study). These two universities were chosen because they were on the top-three rank of the business field in Taiwan, doctoral students of which were assumed to have more experiences in writing English RA abstracts, and to be more aware of their motivation and self-regulatory strategies for writing English RA-abstracts. The doctoral business majors totaled 115, accounting for 45 % of the 255 participants in the pilot study.

Table 2 presents demographics of the participants in terms of year in their doctoral programs and the number of thesis abstracts written. First, the participants were categorized as education majors or business majors, with each category accounting for 100 percent in the following data in terms of years in the doctoral programs and the number of thesis abstract written (Note that a few doctoral students held more than one MA degrees, and had written more than one thesis abstracts). For the year in program, missing data were found from 5 education majors (3.6%) and 7 business majors (6.1%). Apart from the missing data, overall the doctoral students at years 1 and 2 accounted for around 50 percent of the participants (77 education majors = 55%, and 54 business majors = 46.9%), while the doctoral students ranging from years 3 to 7 accounted for the rest of the participants (58 education majors = 41.5% and 54 business majors = 46.9%).

For the number of thesis abstracts written, missing data were found from 34 education majors (24.3%) and 30 business majors (26.1%). Apart from the missing data, a majority of the participants reported that they had written 1 to 3 thesis abstracts in English (89 education majors = 63.6%, and 82 business majors = 71.3%). A few participants reported that they had written no thesis abstracts in English (14 education majors = 10%, and 3 business majors = 2.6%). A small number of participants reported

that they had written 4 to 6 thesis abstracts in English (3 education majors = 2.1%, and 0 business majors = 0.0%). As the majority of the participants reported that they had experiences in writing thesis abstracts in English, it was more meaningful and valid to ask them to report their motivation for English RA-writing and use of self-regulatory strategies for writing English RA-abstracts.

Table 2

Demographics of Doctoral Students of Education Majors and Business Majors in the Pilot Study.

| Year | Education majors | | Business majors | |
|--------------------------|------------------|-------|-----------------|-------|
| | n | % | n | % |
| 1 | 45 | 32.1 | 23 | 20.0 |
| 2 | 32 | 22.9 | 31 | 27.0 |
| 3 | 20 | 14.3 | 20 | 17.4 |
| 4 | 21 | 15.0 | 12 | 10.4 |
| 5 | 9 | 6.4 | 11 | 9.6 |
| 6 | 4 | 2.9 | 6 | 5.2 |
| 7 | 4 | 2.9 | 5 | 4.3 |
| Sum | 135 | 96.4 | 108 | 93.9 |
| Missing | 5 | 3.6 | 7 | 6.1 |
| Total | 140 | 100.0 | 115 | 100.0 |
| Thesis Abstracts written | N | % | n | % |
| 0 | 14 | 10.0 | 3 | 2.6 |
| 1~3 | 89 | 63.6 | 82 | 71.3 |
| 4~6 | 3 | 2.1 | 0 | 0.0 |
| Sum | 106 | 75.7 | 85 | 73.9 |
| Missing | 34 | 24.3 | 30 | 26.1 |
| Total | 140 | 100.0 | 115 | 100.0 |

The Formal Study

In the formal study, participants were recruited from graduate students who

enrolled in the universities in Taiwan in the fall semester 2011. Over two months (November, 2011 to January, 2012), the participants were recruited as a sample representative of the target population. The target population for the study was Taiwanese graduate students who majored in applied linguistics with a basic knowledge of language acquisition (i.e., one of the required courses in their programs was language acquisition). The graduate students were under investigation because (a) they generally had better English literacy skills as prerequisite for research-article writing, than graduate students with other majors, (b) they had a need to learn writing of English research-articles in both master's and doctoral programs so as to present their studies to their disciplinary community, and (c) they were more likely to be aware of their learning process of RA-abstract writing (e.g., writing motivation and strategies) due to their knowledge of language acquisition. Taken together, these characteristics of the L2 graduate students make it possible to collect meaningful data for testing the motivated abstract-writing model (the MAW model) that includes identity-based writing motivation and use of self-regulatory writing strategies in explaining RA-abstract writing ability with a covariate of L2 literacy.

However, this focus on the applied-linguistics majors in graduate programs made recruitment difficult to implement given the small number of the target graduate students in Taiwan. For example, National Taiwan Normal University (NTNU) is one of the largest programs of applied linguistics in Taiwan. In the academic year of 2010 at NTNU, there were 128 students in the master's program of applied linguistics and 40 students in the doctoral program. However, not all of these 168 graduate students were willing to participate in the study for two reasons. First, the study took around two hours to complete three tasks that were cognitively demanding. Second, a few MA students might have limited experiences in writing RA-abstracts (e.g., first-year MA students) and they were less confident in participating in the writing tasks. Therefore,

recruiting participants was of great difficulty in the formal study, making it less likely to recruit a large-sized sample.

When recruiting participants, I targeted both master's and doctoral students in the programs of applied linguistics across 15 universities in Taiwan. These 15 universities were public and private universities in Taiwan, including (1) National Taiwan Normal University (NTNU), (2) National Cheng-Chi University (NCCU), (3) National Tsing-Hua University (NTHU), (4) National Chiao-Tung University (NCTU), (5) Taipei Municipal University of Education (TMUE), (6) National Ocean University (NOU), (7) National Chuang-Hua University of Education (NCHUE), (8) National Kaohsiung Normal University (NKNU), (9) National Taiwan University (NTU), (10), Tamkang University (TU), (11) Chung-Yuan Christian University (CYCU), (12) Kainan University (KNU), (13) Ming-chuan University (MCU), (14) Hsuan Chuang University (HCU), and (15) Tung Hai University (THU). Apart from these 15 universities targeted, a few other universities also have post-graduate programs of applied linguistics, such as National Taiwan University of Science and Technology (NTUST), National Cheng Kung University (NCKU), and Yuan-Ze University (YZU), National Taipei University of Technology (NTUT), and National Taipei University of Education (NTUE). These universities were not included because no volunteers from those universities could be reached over a period of two months when the survey proceeded. Although volunteers might become reachable in those universities at other time points, it was less likely to prolong the duration of the survey (e.g., from two months to three or four months). Such prolonging would result in the survey spanning two or more semesters (rather than one semester in the present study), making the participants' performance relatively incomparable. Thus, I merely targeted the 15 universities stated above to recruit master's and doctoral students over a period of two months.

Despite inclusion of 15 universities, the number of the participants (N=185) seems quite small in SEM research. With this small sample size, it is less likely to examine a complex model with various latent variables and indicators. An indicator requires a minimum of 10 participants in SEM analysis (Hair et al., 2010). This is why the study proposed a rather simple and parsimonious model that only includes 12 indicators when modeling the motivated abstract-writing.

The participants were recruited on class and individual basis. On a class basis, a few professors were contacted in the field across universities, and some of them allowed a brief of the present study during their class break. On an individual basis, a briefing of the study was directly made to graduate students via email, phone or in person. The brief aimed to elaborate on participation flow. That is, if participants volunteered to participate, they would be assigned to Group A or Group B (a design of counterbalance). They would take a series of tasks within 130 minutes according to their grouping. Group A first had an L2 literacy test (55 minutes), an RA-abstract writing task (60 minutes), and then a survey on writing motivation and strategies (15 minutes). Group B first had an RA-abstract writing task (60 minutes), L2 literacy test (55 minutes), and then a survey on writing motivation and strategies (15 minutes). Participants were also told that they would receive an incentive of NT 200 dollars as a small compensation for their time and effort.

A total of 185 graduate students (both master's and doctoral students) participated. The participation took place on an individual or class basis. With regard to the class-based participation, 10 faculty members from 8 institutes in applied linguistics generously lent one of their class times. The generous help makes the study survey possible. As for the individual-based participation, participants underwent the survey in their free time. They signed up a consent form before the study proceeded (see Appendix B for the consent form). All the participants completed the series of tasks

lasting for 130 minutes, according to their grouping. In fact, 86 participants (46.5 % of the total) were in Group A; 99 participants (53.5 %) in Group B.

Table 3

Distribution of the Participants' Universities in the Formal Study

| Schools | n | % | Accumulated % |
|---------------|-----|-------|---------------|
| 1. NTNU (師大) | 52 | 28.1 | 28.1 |
| 2. NCHUE(彰師大) | 30 | 16.2 | 44.3 |
| 3. TKU(淡江) | 21 | 11.4 | 55.7 |
| 4. NTHU(清大) | 20 | 10.8 | 66.5 |
| 5. CYCU(中原) | 14 | 7.6 | 74.1 |
| 6. THU(東海) | 9 | 4.9 | 79.0 |
| 7. NCCU(政大) | 8 | 4.3 | 83.3 |
| 8. HCU(玄奘) | 8 | 4.3 | 87.6 |
| 9. NOU(海洋) | 7 | 3.8 | 91.4 |
| 10.NCTU(交大) | 5 | 2.7 | 94.1 |
| 11.NTU(台大) | 3 | 1.6 | 95.7 |
| 12.TMUE (市北師) | 3 | 1.6 | 97.3 |
| 13.KNU(開南) | 2 | 1.1 | 98.4 |
| 14.MCU(銘傳) | 2 | 1.1 | 99.5 |
| 15.NKNU(高師大) | 1 | 0.5 | 100.0 |
| Total | 185 | 100.0 | 100.0 |

Table 3 reports the 15 universities where the participants came from. On the top 5 rank, 28.1 % of the total participants (52 participants) were from NTNU, 16.2 % of the participants from NCHUE (30 participants). And 11.4 % of the participants were from TKU (21 participants), 10.8% from NTHU (20 participants), and 7.6 % from CYU (14 participants). Taken together, approximate 75 % of the participants (74.1% with 137 participants) came from these 5 universities. The remaining universities were shown in Table 3 as well.

Demographics of the participants in the formal study. Table 4 shows demographics of the participants in the formal study. For the feature of gender, 70.8 %

of the participants were female and 29.2 % were male, suggesting the fact that the population has more female graduate students than the males in the applied linguistics field in Taiwan. For the status of the participants, there were 151 master's students (81.6%) and 34 doctoral students (18.4%). Among the 151 master's students, more than half of them were at the first two years: 46 participants at year 1 (24.9% of the total participants) and 78 participants at year 2 (42.2%). Among the 34 doctoral students, more than half of them were at the first four years: 5 at year 1(2.7% of the total participants), 8 at year 2 (4.3%), 7 at year 3 (3.8%), or 6 at year 4 (3.2%).

The participants' backgrounds of English learning were reported in terms of years of learning English, years of learning English writing, and years of learning English research-article (RA) writing. For years of learning English, the mean was 14.28 with a range of 5 to 25. For years of learning English writing, the mean was 8.76 with a range of 1 to 20. For years of learning English RA-writing, the mean was 2.28 with a range of 0.5 to 13.

Table 4

Demographics of the Participants in the Formal Study

| | Feature | Number | Percent |
|--------|------------------|--------|---------|
| Gender | Female | 131 | 70.8 |
| | Male | 54 | 29.2 |
| | Sum | 185 | 100.0 |
| | Missing data=0 | | |
| Status | Master (M); Year | | |
| | 1 | 46 | 24.9 |
| | 2 | 78 | 42.2 |
| | 3 | 17 | 9.2 |
| | 4 | 10 | 5.4 |
| | 5 | 0 | 0.0 |
| | 6 | 0 | 0.0 |
| | 7 | 0 | 0.0 |

| | | | | | |
|---|-------------------|-----|----|-------------|-------------|
| | Sum | 151 | | 81.6 | |
| | Missing data=0 | | | | |
| | Doctoral(D); Year | | | | |
| | 1 | 5 | | 2.7 | |
| | 2 | 8 | | 4.3 | |
| | 3 | 7 | | 3.8 | |
| | 4 | 6 | | 3.2 | |
| | 5 | 3 | | 1.6 | |
| | 6 | 4 | | 2.2 | |
| | 7 | 1 | | 0.5 | |
| | Sum | 34 | | 18.4 | |
| | Missing data=0 | | | | |
| Years of learning English | Mean= 14.28 | | | | |
| | Range= 5-25 | | | | |
| | N=182 (valid) | | | | |
| | Missing data=3 | | | | |
| Years of learning English writing | Mean= 8.76 | | | | |
| | Range=1-20 | | | | |
| | N=178 (valid) | | | | |
| | Missing data=7 | | | | |
| Years of learning research-articles writing | Mean= 2.28 | | | | |
| | Range=0.5-13 | | | | |
| | N=178 (valid) | | | | |
| | Missing data=7 | | | | |
| Journal-Paper | | M | D | M | D |
| Abstracts written | 0 | 119 | 9 | 64.3 | 4.9 |
| | 1~3 | 24 | 20 | 13.0 | 10.8 |
| | 4~6 | 6 | 2 | 3.2 | 1.1 |
| | 7~9 | 2 | 3 | 1.1 | 1.6 |
| | Sum | 151 | 34 | 81.6 | 18.4 |
| | Missing data =0 | | | | |
| Conference | | M | D | M | D |
| Abstracts written | 0 | 99 | 1 | 53.5 | 0.5 |
| | 1~3 | 49 | 14 | 26.5 | 7.6 |
| | 4~6 | 3 | 14 | 1.6 | 7.6 |
| | 7~9 | 0 | 5 | 0.0 | 2.7 |
| | Sum | 34 | | 81.6 | 18.4 |

Missing data=0

| Thesis Abstracts written | | M | D | M | D |
|----------------------------------|--|-----|----|-------------|-------------|
| 0 | | 112 | 5 | 60.5 | 2.7 |
| 1~3 | | 39 | 29 | 21.1 | 15.7 |
| 4~6 | | 0 | 0 | 0.0 | 0.0 |
| Sum | | 151 | 34 | 81.6 | 18.4 |
| Missing data=0 | | | | | |
| Other types of Abstracts written | | M | D | M | D |
| 0 | | 140 | 25 | 75.7 | 13.5 |
| 1~3 | | 10 | 8 | 5.4 | 4.3 |
| 4~6 | | 1 | 1 | 0.5 | 0.5 |
| Sum | | 151 | 34 | 81.6 | 18.4 |
| Missing data=0 | | | | | |

The participants' experiences of English RA-abstract writing were reported in terms of various types of abstracts the participants had written. Across the four types of abstracts, conference abstracts were reported as the most commonly written: 1 to 3 abstracts written by 49 master's students (26.5% of the total participants) and by 14 doctoral students (7.6 %); 4 to 6 abstracts by 3 master's students (1.6%), and by 14 doctoral students (7.6 %); 7 to 9 abstracts by 5 doctoral students (2.7%). Thesis abstracts were reported as the second most commonly written: 1 to 3 abstracts written by 39 master's students (21.1%) and by 29 doctoral students (15.7 %). Journal paper abstracts were reported as the third most commonly written: 1 to 3 abstracts written by 24 master's students (13%) and by 20 doctoral students (10.8%); 4 to 6 abstracts by 6 master's students (3.2 %), and by 2 doctoral students (1.1 %); 7 to 9 abstracts by 2 master's students (1.1%) and by 3 doctoral students (1.6 %). Other types of abstracts were reported as the least commonly written: 1 to 3 abstracts by 10 master's students

(5.4 %) and by 8 doctoral students (4.3 %); 4 to 6 abstracts by 1 master's student (0.5%) and by 1 doctoral student (0.5%). Overall, this report on the written abstracts indicates that although the participants might not write abstracts of all types, quite a few of them had written abstracts of either type.

However, some participants at year 1 in the master program reported that they had not written any abstracts at all (26 out of 46), although they had been engaged in learning of RA-abstract writing and thus has been aware of essential components of RA-abstracts. This learning engagement in RA-abstract writing made the participants qualified for the study participation, since the study did not intend to exclusively target sophisticated writers of RA-abstracts. Instead, the study intended to include the participants who have a variety of experiences in RA-abstract writing, ranging from great experiences to the limited. By including this variety of RA-abstract writing experiences, the study was more likely to capture a learning process of motivated RA-abstract writing in which L2 graduate students incrementally accumulate their experiences in writing RA-abstracts over years. With such a motivated learning process targeted, the participants at year 1 in the master's programs could be seen as being at the early stage of this process.

Measures

To test the proposed model showing predictors for L2 graduate students' RA-abstract writing, the present study employed the SEM design. Within the SEM design, each latent variable is suggested to be reflected by two to three observed variables (Kline, 2011). Accordingly, the present study incorporates two observed variables for the latent variable of L2 literacy (reading ability and writing ability), five for identity-based writing motivation (interest value, utility value, cost, connectedness

value, and ability self-concept), three for self-regulatory writing strategies (cognition regulation, motivation regulation, and socio-interactive resources regulation), and two for RA-abstract writing ability (a score on global move and a score on local pattern).

A questionnaire set was made by arranging a demographics questionnaire, a motivation inventory, and writing strategy inventory in sequence (see appendix A). In this questionnaire set, the items from the three types of questionnaires were numbered consecutively throughout. Participants first filled in the demographics questionnaire to provide their academic background, years of learning research-articles in English, and their experiences of writing and reading research-article abstracts (see demographics in the formal study stated earlier). Details about the identity-based writing motivation writing inventory and self-regulatory writing strategy inventory are as follows.

Identity-based Writing Motivation Inventory (IWMI)

In the present study, identity-based writing motivation is defined as an identity-development process in which L2 graduate students seek to develop an identity of non-native- English-speaking (NNES) researchers by learning to write RAs acceptable to their disciplinary communities.

Five subscales of IWMI. I adopted items from several existing scales to develop a new scale of IWMI, which included five subscales, interest value, utility value, cost, connectedness value, and ability self-concept. These five subscales were included on the basis of Eccles' expectancy-value theory (Eccles et al., 1983; Eccles 2009) and Gardner's (1985, 2007) construct of Integrativeness. That is, when defining identity-based writing motivation, I generally adopted Eccles' expectancy-value theory to operationalize 4 subscales (out of 5), including interest value, utility value, cost, and ability self-concept. In addition, I substituted a subscale of connectedness value for the attainment value in Eccles' expectancy-value theory because I recognized the

importance of gaining a social connection with a discourse community to L2 learning attainment (Dörnyei, 2005, 2009; Gardner, 2001, 2007). The connectedness value proposed here could be viewed as a context-specific attainment value. According to Eccles' (2009) refined expectancy-value theory, attainment value reflects subjective values that the individuals assign to achievement-related tasks by how far the task success promotes development of their desired identities at the personal and collective levels. As a context-specific attainment value, the connectedness value reflects L2 graduate students' subjective value of how RA-writing success promotes the development of a non-native-English-Speaker (NNES) researcher identity.

Particularly, I specified the connectedness value as the subjective appraisals of reasons and benefits that L2 graduate students assign to a NNES-researcher identity gained through writing English RAs acceptable to chosen disciplinary communities. Taken together, the five subscales mentioned above were operationalized by a total of 25 items. The items were adapted from a number of previous works in educational psychology (i.e., Battle & Wigfield, 2003; Conlney 2007; Luttrell, Callen, Allen, Wood, Deeds, & Richard, 2010), and in L2 motivation (i.e., Gardner's 2004; Gardner, Tremblay, & Masgoret, 1997; Mori & Gobel, 2006).

Specifically, the four subscales of the identity-based writing motivation (i.e., interest value, utility value, cost, and ability self-concept) were developed from the items in the scales of Eccles, Wigfield, Blumenfeld, Conley, and their colleagues (Eccles, Wigfield, Harold, Blumenfeld, 1993; Eccles & Wigfield, 1995; Luttrell et al., 2010; Wigfield, Eccles, Yoon, Harold, Arbretton, Freedman-Doan, & Blumenfeld, 1997; Conley, 2007). In particular, the present study largely adapted Conley's (2007) scale of elementary-school students' values for math learning and Luttrell et al.'s (2010) scale of math value for college non-math majors because these two scales provided a relatively complete synthesis of questionnaire items designed by Eccles and her colleagues. The

other subjective task value constructed specifically for the present study, the connectedness value, was operationalized by the items adapted from Attitude/Motivation Test Battery (AMTB) (Gardner, 2004).

Table 5 shows the items of the Identity-based Writing Motivation Inventory (IWMI) developed in the study. Interest Value (5 items) refers to L2 graduate students' enjoyment of writing RAs (e.g., "I find English RA writing very interesting"). The first 4 items (Items 12, 14, 16, and 18) were adapted from Conley's (2007) scale of elementary-school students' values for math learning, while the fifth item (Item 20) was from Luttrell et al.'s (2010) scale of math value drawn by college non-math majors. Utility Value (5 items) refers to L2 graduate students' beliefs about the usefulness of writing RAs for their short-term or long-term goals in studies or career paths (e.g., Writing research-articles in English will be useful for me later in life.). Items 13 and 21 were adapted from Luttrell et al.'s (2010) Scale, while Items 15, 17, and 19 were adapted from Conley's (2007) scale. Cost (5 items) evaluates L2 graduate students' judgment about the amount of time and effort required to succeed in writing RAs (e.g., "Success in writing of English RA requires that I give up other activities I enjoy."). Items 22 and 24 were adapted from Conley's (2007) scale, while Item 26 was adapted from Battle and Wigfield's (2003) scale for women's career choices. Items 28 and 30 were adapted from Luttrell et al.'s (2010) scale.

Connectedness value (5 items) evaluates L2 students' subjective value for gaining a social connection with a chosen disciplinary community by writing RAs acceptable to the community. (e.g., "Writing of English RAs is important for me because it will allow me to converse with varied discourse members in my field."). All 5 items (Items 23, 25, 27, 29, and 31) were adapted from Gardner's (2004) Attitude Motivation Test Battery.

Finally, ability self-concept (5 items) refers to individuals' perception about their ability to accomplish the task of writing English RAs. Participants were asked to

indicate how confident they are in aspects, such as “learn everything about writing English research-articles.” Items 32, 33, and 36 were adapted from Conley’s (2007) scale, while Items 34 and 35 were from Mori and Gobel’s (2006) scale.

For these four subscales, a 5-point Likert scale ranging from 5 points (strongly agree) to 1 point (strongly disagree) was used as the response format. A high score corresponds to a high degree of a given motivational dimension. Accordingly, responses to the 5 items in the construct of cost were reversely coded as so to reflect the items’ negatively worded characteristics (e.g., Item 22: *I have to give up a lot to do well in writing research-articles in English.* Item 28: *Writing English research-articles brings me tremendous stress.*).

Table 5

Items in the Identity-based Writing Motivation Inventory

| Interest value (5 items) | Utility value (5 items) |
|--|--|
| 12. I find English research-article writing very interesting. (adapted from Conley, 2007) 我覺得英文學術論文寫作很有趣。 | 13. Having the ability to write English research-articles will be beneficial to me. (adapted from Luttrell et al., 2010) 有能力寫英文學術論文將對我有助益。 |
| 14. Writing research-articles in English is exciting to me. (adapted from Conley, 2007) 寫英文學術論文令我感到興奮。 | 15. Writing research-articles in English will be useful for me later in life. (adapted from Conley, 2007) 寫英文學術論文對我以後的人生很有用 |
| 16. I am fascinated by writing research-articles in English. (adapted from Conley, 2007) 我著迷於撰寫英文學術論文。 | 17. Skills of English research-article writing are valuable because they will help me in the future. (adapted from Conley, 2007) 英文學術論文的寫作技巧很寶貴，因為這些技巧對我的未來有幫助。 |
| 18. I enjoy writing research-articles in English. (adapted from Conley, 2007) 我很享受寫英文學術論文。 | 19. Being good at writing research-articles in English will be important when I look for a job or pursue further studies. (adapted from Conley, 2007) 當我要找工作或是再深造時，擅長撰寫英文學術論文是很重要的。 |
| 20. Writing research-articles in English appeals to me. (adapted from Luttrell et al., 2010). 寫英文學術論文對我有很大的吸引力。 | 21. I see a point in being able to write research-articles in English. (adapted from Luttrell, et al., 2010). 我理解有能力寫英文學術論文的意義所在。 |

Cost (5 items)

22. I have to give up a lot to do well in writing research-articles in English. (adapted from Conley, 2007)

為了寫出好的英文學術論文，我必須放棄很多事情。

24. Success in writing of English research-articles requires that I give up other activities I enjoy. (adapted from Conley, 2007)

英文學術論文寫作上的成就需要我放棄其他自己喜歡的活動。

26. Writing English research-articles brings me tremendous stress. (adapted from Battle & Wigfield, 2003)

寫英文學術論文帶給我巨大的壓力。

28. Writing research-articles in English takes excessive effort for me to succeed. (adapted from Luttrell et al., 2010).

我需要極努力才能成功撰寫英文學術論文。

30. Writing research-articles in English causes me a lot of anxiety. (adapted from Luttrell et al., 2010).

寫英文學術論文讓我很焦慮。

Connectedness Value (5 items)

23. Being good at writing English research-articles is important to me because it will allow me to be more at ease with our academic discourse members who can read and write English research articles. (adapted from Gardner, 2004)

擅長寫英文學術論文對我很重要，因為這會讓我更自在地與我的學術領域成員相處，這些成員都能讀、寫英文論文。

25. Being good at writing English research-articles is important to me because it will allow me to connect with varied discourse members in my field. (adapted from Gardner, 2004)

擅長寫英文學術論文對我很重要，因為這會讓我與自己的學術領域中不同的成員有所連結。

27. Being good at writing English research-articles is important to me because it will enable me to demonstrate my familiarity with the disciplinary culture in my field. (adapted from Gardner, 2004)

擅長寫英文學術論文對我很重要，因為這會展現我對自己領域學科文化的熟悉度。

29. Being good at writing English research-articles is important to me because it will increase my chances of participating in the activities of my disciplinary communities (e.g. presentation in conferences or seminars, publication in conference proceedings or journal papers). (adapted from Gardner, 2004)

擅長寫英文學術論文對我很重要，因為這會增加我參與自己學科社群活動的機會（例如，口頭發表會議論文，出版會議論文集或期刊論文）。

31. Being good at writing English research-articles is important to me because it will allow me to gain a social prestige in my disciplinary community.

(adapted from Gardner, 2004)

擅長寫英文學術論文對我很重要，因為這會讓我在自己的學科社群中，取得社會威望。

Ability self-concept (5 items)

作答時，請依據您對各題所述事項之自信程度，圈選一個最貼近的答案。

How confident am I in terms of the following descriptions:

32. I can learn everything about writing English research-articles. (adapted from Conley, 2007)
我可以學會每件關於英文學術論文寫作的事。
 33. I can successfully complete writing English research-articles, if I don't give up. (adapted from Conley, 2007)
如果不放棄的話，我可以成功完成英文學術論文寫作。
 34. I am good at writing English research-articles. (adapted from Mori & Gobel, 2006)
我很擅長寫英文學術論文。
 35. Writing English research-articles is one of my strengths. (adapted from Mori & Gobel, 2006).
寫英文學術論文是我的強項之一。
 36. I can solve the most difficult problems in writing English research-articles. (adapted from Conley, 2007)
我可以解決英文學術論文寫作中最困難的問題。
-

Examination of the psychometric properties of IWMI. To ensure solid psychometric properties of Identity-based Writing Motivation Inventory (IWMI) before the formal study, a series of reliability and validity analyses of the questionnaire were conducted on the 255 participants in the pilot study.

In the pilot study, evidence for reliability of IWMI was gained by item analysis and internal consistency. For each subscale of IWMI, item analysis was conducted by (a) computing descriptive statistics (i.e., mean and standard deviation), (b) correlating item

score with the sum of all the items in the subscale (i.e., corrected item-sum correlation), and (c) computing a Cronbach alpha coefficient when deleting an item. Cronbach alpha coefficient was also computed for each of the five subscales of the motivation questionnaire. Reliability analyses on the five subscales of IWMI are presented below.

For the Interest Value subscale, the means of the five items ranged from 2.58 to 3.19; the standard deviations ranged from 0.84 to 0.94; the correlated item-sum correlation coefficients ranged from .67 to .75 (see Table 6). The Cronbach alpha coefficients computed by deleting one item at a time ranged from .85 to .87, lower than the Cronbach alpha coefficient for the entire subscale (.88). This result suggests that no improvements in the overall alpha coefficients could be made by deleting any items from the subscale. These results of reliability analyses indicate that the Interest Value subscale has good reliability in terms of internal consistency.

Table 6

Descriptive Statistics for the Interest Value Subscales

| Item | <i>M</i> | <i>SD</i> | Corrected Item-sum correlation | Cronbach alpha coefficient when deleting an item |
|---|----------|-----------|--------------------------------|--|
| 12. I find English research-article writing very interesting. | 3.06 | 0.87 | .71* | .85 |
| 14. Writing research-articles in English is exciting to me. | 3.05 | 0.85 | .75* | .85 |
| 16. I am fascinated by writing research-articles in English. | 2.58 | 0.88 | .70* | .86 |
| 18. I enjoy writing research-articles in English. | 2.81 | 0.84 | .74* | .85 |
| 20. Writing research-articles in English appeals to me. | 3.19 | 0.94 | .67* | .87 |

Note. N=255. Cronbach alpha for the entire subscale =.88. * $p < .05$

For the Utility Value subscale, the means of the five items ranged from 4.07 to

4.38; the standard deviations ranged from 0.63 to 0.81; the corrected item-sum correlation coefficients ranged from .48 to .61 (see Table 7). The Cronbach alpha coefficients computed by deleting one item at a time ranged from .73 to .77, lower than the Cronbach alpha coefficient for the entire subscale (.78). The result suggests that no improvements in the overall alpha coefficients could be made by deleting any items from the subscale. These results of reliability analyses indicate that the Utility Value subscale also has good reliability in terms of internal consistency.

Table 7
Descriptive Statistics for the Utility Value Subscale

| Item | <i>M</i> | <i>SD</i> | Corrected Item-sum correlation | Cronbach alpha coefficient when deleting an item |
|--|----------|-----------|--------------------------------------|---|
| 13 Having the ability to write English research-articles will be beneficial to me. | 4.35 | 0.63 | .61* | .73 |
| 15 Writing research-articles in English will be useful for me later in life. | 4.08 | 0.81 | .58* | .73 |
| 17 Skills of English research-article writing are valuable because they will help me in the future. | 4.13 | 0.74 | .56* | .74 |
| 19 Being good at writing research-articles in English will be important when I look for a job or pursue further studies. | 4.38 | 0.72 | .57* | .74 |
| 21 I see a point in being able to write research-articles in English. | 4.07 | 0.71 | .48* | .77 |

Note. N=255. Cronbach alpha for the entire subscale = .78. * $p < .05$.

For the Cost subscale, the means of the five items ranged from 2.01 to 2.76; the

standard deviations ranged from 0.88 to 1.04; the corrected item-sum correlation coefficient ranged from .57 to .74 (see Table 8). The Cronbach alpha coefficients computed by deleting one item at a time ranged from .79 to .84, lower than the Cronbach alpha coefficient for the entire subscale (.85). The result suggests that no improvements in the overall alpha coefficients could be made by deleting any items from the subscale. These results of reliability analyses indicate that the Cost subscale has good reliability in terms of internal consistency.

Table 8
Descriptive Statistics for the Cost Subscales

| Item | <i>M</i> | <i>SD</i> | Corrected Item-sum correlation | Cronbach alpha coefficient when deleting an item |
|---|----------|-----------|--------------------------------------|---|
| 22. I have to give up a lot to do well in writing research-articles in English. | 2.49 | 1.04 | .67* | .81 |
| 24. Success in writing of English research-articles requires that I give up other activities I enjoy. | 2.76 | 1.02 | .61* | .83 |
| 26. Writing English research-articles brings me tremendous stress. | 2.60 | 1.01 | .74* | .79 |
| 28. Writing research-articles in English takes excessive effort for me to succeed. | 2.01 | 0.88 | .57* | .84 |
| 30. Writing research-articles in English causes me a lot of anxiety. | 2.63 | 0.97 | .70* | .81 |

Note. N=255. Cronbach alpha for the entire subscale =.85. * $p < .05$.

For the Connectedness Value subscale, the means of the five items ranged from 3.91 to 4.27; the standard deviations ranged from 0.72 to 0.79; the corrected item-sum correlation coefficients ranged from .53 to .63 (see Table 9). The Cronbach alpha coefficients computed by deleting one item at a time ranged from .74 to .77, lower than

the Cronbach alpha coefficient for the entire subscale (.79), which suggests that no improvements in the overall alpha coefficients could be made by deleting any items from the subscale. These results of reliability analyses indicate that the Connectedness Value subscale has good reliability in terms of internal consistency.

Table 9

Descriptive Statistics for the Connectedness Value Subscale

| Item | <i>M</i> | <i>SD</i> | Corrected Item-sum correlation | Cronbach alpha coefficient when deleting an item |
|--|----------|-----------|--------------------------------------|---|
| 23 Being good at writing English research-articles is important to me because it will allow me to be more at ease with our academic discourse members who can read and write English research articles. | 4.12 | 0.79 | .57* | .76 |
| 25 Being good at writing English research-articles is important to me because it will allow me to connect with varied discourse members in my field. | 4.03 | 0.73 | .63* | .74 |
| 27 Being good at writing English research-articles is important to me because it will enable me to demonstrate my familiarity with the disciplinary culture in my field. | 3.99 | 0.79 | .59* | .75 |
| 29 Being good at writing English research-articles is important to me because it will increase my chances of participating in the activities of my disciplinary communities (e.g. presentation in conferences or seminars, publication in conference proceedings or journal papers). | 4.27 | 0.72 | .53* | .77 |

| | | | | |
|--|------|------|------|-----|
| 31 Being good at writing English research-articles is important to me because it will allow me to gain a social prestige in my disciplinary community. | 3.91 | 0.79 | .54* | .76 |
|--|------|------|------|-----|

Note. N=255. Cronbach alpha for the entire subscale = .79. * $p < .05$.

For the Ability Self-concept subscale, the means of the five items ranged from 2.53 to 3.90; the standard deviations ranged from 0.80 to 0.93; the corrected item-sum correlation coefficients ranged from .56 to .81 (see Table 10). The Cronbach alpha coefficients computed by deleting one item at a time ranged from .83 to .88 equal to or lower than the Cronbach alpha coefficient for the entire subscale (.88). The result suggests that no improvements in the overall alpha coefficients could be made by deleting any items from the subscale. These results of reliability analyses indicate that the Ability Self-concept subscale has good reliability in terms of internal consistency.

Table 10

Descriptive Statistics for the Ability Self-concept Subscales

| Item | <i>M</i> | <i>SD</i> | Corrected Item-sum correlation | Cronbach alpha coefficient when deleting an item |
|---|----------|-----------|--------------------------------|--|
| 32 I can learn everything about writing English research-articles. | 3.29 | 0.82 | .72* | .85 |
| 33 I can successfully complete writing English research-articles, if I don't give up. | 3.90 | 0.80 | .56* | .88 |
| 34 I am good at writing English research-articles. | 2.74 | 0.91 | .81* | .83 |
| 35 Writing English research-articles is one of my strengths. | 2.53 | 0.93 | .77* | .84 |
| 36 I can solve the most difficult problems in writing English research-articles. | 2.77 | 0.88 | .69* | .86 |

Note. N=255. Cronbach alpha for the entire subscale =.88. * $p < .05$.

The internal consistency of the five subscales in IWMI was determined by Cronbach alpha coefficients and reported in Table 11, ranging from .78 to .88. These coefficients all go beyond the desired level of .70, again indicating that IWMI has good reliability in terms of internal consistency.

Table 11
Cronbach Alpha of the Five Subscales in IWMI

| Identity-based Writing Motivation Inventory (IWMI) | Cronbach alpha |
|--|----------------|
| Interest Value | .88 |
| Utility Value | .78 |
| Cost | .85 |
| Connectedness Value | .79 |
| Ability Self-concept | .88 |

In the pilot study, preliminary support for the construct validity of the IWMI was evaluated through a confirmatory factor analysis (CFA). A confirmatory factor analysis (CFA) with robust maximum likelihood estimation was conducted on the 25 items of the IWMI, using LISREL 8.8 (Jöreskog & Sörbom, 1996). The CFA was used to confirm the hypothesized five-factor structure suggested by Eccles' expectancy-value theory, including Interest Value, Utility Value, Cost, Connectedness Value, and Ability Self-concept.

To present the goodness-of-fit of this hypothesized factor structure, preliminary fit criteria and overall model fit were examined (Bagozzi & Yi, 1988; Tseng, et al., 2006). For the preliminary fit criteria, the factor loading of each item on its corresponding construct in IWMI was reported in Table 12. Overall, each item demonstrated a satisfactory factor loading, ranging from .57 to .92. All factor loadings reached the

statistical significant level.

Table 12

Factor Loadings of the Items in the 5 Subscales of IWMI

| Item | Factor loading |
|---|----------------|
| Subscale: Interest Value | |
| 12. I find English research-article writing very interesting. | .77* |
| 14. Writing research-articles in English is exciting to me. | .80* |
| 16. I am fascinated by writing research- articles in English. | .76* |
| 18. I enjoy writing research-articles in English. | .82* |
| 20. Writing research-articles in English appeals to me. | .70* |
| Subscale: Utility Value | |
| 13 Having the ability to write English research-articles will be beneficial to me. | .68* |
| 15 Writing research-articles in English will be useful for me later in life. | .66* |
| 17 Skills of English research-article writing are valuable because they will help me in the future. | .66* |
| 19 Being good at writing research-articles in English will be important when I look for a job or pursue further studies. | .67* |
| 21 I see a point in being able to write research-articles in English. | .59* |
| Subscale: Cost | |
| 22. I have to give up a lot to do well in writing research-articles in English. | .62* |
| 24. Success in writing of English research-articles requires that I give up other activities I enjoy. | .57* |
| 26. Writing English research-articles brings me tremendous stress. | .89* |
| 28. Writing research-articles in English takes excessive effort for me to succeed. | .65* |
| 30. Writing research-articles in English causes me a lot of anxiety. | .85* |
| Subscale: Connectedness Value | |
| 23 Being good at writing English research-articles is important to me because it will allow me to be more at ease with our academic discourse members who can read and write English research articles. | .68* |
| 25 Being good at writing English research-articles is important to me because it will allow me to connect with varied discourse members in my field. | .73* |
| 27 Being good at writing English research-articles is important to me because it will enable me to demonstrate my familiarity with the disciplinary culture in my field. | .64* |
| 29 Being good at writing English research-articles is important to me because it | .62* |

| | |
|---|------|
| will increase my chances of participating in the activities of my disciplinary communities (e.g. presentation in conferences or seminars, publication in conference proceedings or journal papers). | |
| 31 Being good at writing English research-articles is important to me because it will allow me to gain a social prestige in my disciplinary community. | .62* |
| Subscale: Ability Self-concept | |
| 32 I can learn everything about writing English research-articles. | .68* |
| 33 I can successfully complete writing English research-articles, if I don't give up. | .55* |
| 34 I am good at writing English research-articles. | .92* |
| 35 Writing English research-articles is one of my strengths. | .91* |
| 36 I can solve the most difficult problems in writing English research-articles. | .72* |

Note. $N=255$. * $p < .05$.

As shown in Table 13, the correlations among the five latent variables were computed to show whether these latent variables can be discriminated from each other (correlations cannot be too close to 1.00, better $< .90$ (Kline, 2011)). Table 13 indicates that the five latent variables were discriminated from each other well, with the correlations ranging from .00 to .74.

Yet, a number of correlations deserve more attention. First, the correlation between Cost and Connectedness Value was $-.26$. The correlation between Cost and Utility Value was $.03$, t value = 0.39 (*ns.*). Second, the correlation between Ability Self-concept and Connectedness Value was $.00$. The correlation between Ability Self-concept and Utility Value was $.09$, t value = 1.28 (*n.s.*). Third, the correlation between Connectedness Value and Utility Value was $.74$. These correlations suggested that when defining identity-based writing motivation with the framework of expectancy-value theory (Eccles, 2009), there are two possible higher-order latent variables. The first latent variable may include Interest Value, Cost, and Ability Self-concept, while the second latent variable may include Utility Value and

Connectedness Value, on the basis of the data observed in the pilot study.

Table 13

Correlations among the Five Latent Variables in IWMI

| Subscales | 1 | 2 | 3 | 4 |
|-------------------------|------|------|-------|-----|
| 1. Interest Value | - | | | |
| 2. Utility Value | .39* | - | | |
| 3. Cost (Non-cost) | .44* | .03 | - | |
| 4. Connectedness Value | .15* | .74* | -.26* | - |
| 5. Ability Self-concept | .59* | .09 | .57* | .00 |

Note. $N=255$. Cost can be viewed as Non-cost due to the reverse coding of the item measures. $*p < .05$.

For the overall model fit, this CFA model showed an acceptable fit ($\chi^2(265) = 669.88$, $p < .05$, χ^2/df ratio (normed χ^2) = 2.53, RMSEA=0.08, CFI=.94, except χ^2 statistics. Because testing of χ^2 statistics was very sensitive to sample size, the CFA model was mainly evaluated by four goodness-of-fit indices with their cutoffs (Hair et al., 2010), including normed χ^2 (ranging from 1 to 3), the root mean square error of approximation (RMSEA, less than 0.08), comparative fit index (CFI, greater than or equal to 0.90 on the 0-1.0 scale), and non-normed fit index (NNFI, close to 1 on the 0-1.0 scale). Because the CFA model demonstrated an acceptable model fit, indicating that the proposed model with five motivational constructs can reasonably explain the observed data. Thus, these five motivational constructs in IWMI can be seen to serve as a valid measure of identity-based writing motivation. The reliability analysis and the CFA presented above tentatively supported the psychometric quality of the Identity-based Writing Motivation Inventory (IWMI). Accordingly, IWMI was used in the formal study.

Self-regulatory Writing Strategy Inventory (SWSI)

In the present study, use of self-regulatory abstract writing strategies is defined as perceived effort that L2 graduate students make to effectively regulate cognition, motivation, behavior, and context to better approach Research-Article (RA) abstract writing. The perceived effort suggest that the study addressed L2 graduate students' perceptions of their use of the strategies, rather than the actual strategies employed.

Three subscales of SWSI. To investigate L2 graduate students' perceived use of self-regulatory writing strategies, Self-Regulatory Writing Strategy Inventory (**SWSI**) was developed. Specifically, SWSI had three subscales, including two adapted from Wolters et al.'s (2003) subscales in educational psychology, cognition regulation and motivation regulation, and one adapted from Oxford's (2011) proposal in L2 learning, socio-interactive resources regulation. Instead of directly adopting Wolters et al.'s (2003) third subscale, behavior regulation, the study specified this scale as socio-interactive resources regulation to highlight "the social nature of learning" in second language acquisition (Pintrich, 2004; Oxford, 2011). Within these three subscales, a number of items were then adapted from the literature, including Wolters et al.'s (2003) academic self-regulated learning strategy scale, Petrić and Czarl's (2003) L2 writing strategy scale, Yen's (2007) L2 writing strategy scale for Taiwanese college English majors, Flowerdew's (1999a) synthesized RA writing strategies, and Swales and Feak's (2009) RA-abstract writing checklist. Wording of these learning and writing strategies in previous studies were tailored to the present research goals.

Table 14 demonstrates the items in SWSI with their origins noted. In the Cognition Regulation subscale, Items 37, 38, 40, 41, 42, 43, and 44 were adapted from Petrić and Czarl's (2003) L2 writing strategy scale, Item 39 from Yen's (2007) L2 writing strategy scale. Items 45 and 54 was adopted from the informants' strategy (i.e., the two doctoral students were interviewed in the development of SWSI). Items 46 and 47 were adapted

from Flowerdew's (1999 a) synthesized RA writing strategies, and Items 48 to 53 from Swales and Feak's (2009) checklist for RA-abstract writing.

In the Motivation Regulation subscale, Items 55, 57, 59, 61, 63, 66, 68, 70, and 72 were all adapted from Wolters et al.'s (2003) academic self-regulated learning strategy scale. In the Socio-Interactive Resources Regulation subscale, Items 56, 58, 60, 62, 67, and 69 were adapted from Petrić and Czarl's (2003) L2 writing strategy scale. Items 64 and 65 were adapted from Flowerdew's (1999a) synthesized RA writing strategies. Items 71, 73, and 74 were adapted from Wolters et al.'s (2003) academic self-regulated learning strategy scale. Item 75 were adapted from the informant's strategy (i.e., the two doctoral students were interviewed in the development of SWSI). These items were originally written in English; they were translated into Chinese to ensure that the participants can interpret the items more accurately with the use of their native language. In addition, the Chinese translation was back-translated into English by two experienced English teachers who were native Chinese speakers, to ensure the wording was generally clear and precise.

Following definitions of the three constructs of self-regulatory writing strategies, 39 items were synthesized from the literature to reflect these 3 constructs of SWSI. These preliminary 39 items were assessed by a 5-point Likert-type response format, with the following responses, from 5 points (always true of me) to 1 point (never true of me). A high score corresponds to a high degree of endorsement to a given dimension of SWSI.

Table 14

Items in Self-regulatory Writing Strategy Inventory

| Cognition Regulation | Motivation Regulation | Socio-interactive Resources Regulation |
|---|---|---|
| <p>37. In writing English research-article (RA) abstracts, I select the most important information from my entire RA (either using my native language or English to select and think). (adapted from Petrić & Czarl, 2003) 寫英文論文摘要時，我從自己的整篇學術論文，選出最重要的資訊放入摘要中。(不管是用母語或英語來選擇訊息，或是思考。)</p> <p>38. I simplify what I want to say in my English RA-abstract if I don't know how to express my thoughts in English. (adapted from Petrić & Czarl, 2003) 寫英文論文摘要時，若不知道怎麼用英文表達自己的想法，我就簡化自己想說的話。</p> <p>39. I read model sentences in published English RA-abstracts (e.g. journal articles, book chapters, or conference proceedings), and make similar sentences for my own English RA-abstract. (adapted from Yen, 2007) 我閱讀已發表的英文摘要(例如期刊論文、書的章節、或是研討會論文集)的句子範例，然後在自己的英文摘要中造類似的句子。</p> <p>40. If I don't know an English word in my RA-abstract writing, I make sure I get my meanings across by use of varying effective strategies for word usage (e.g., look up the dictionary on the spot; write it in my native language or use a similar English word, and later look up the</p> | <p>55. I try to connect the English RA-abstract writing with something I like doing or something I find interesting. (adapted from Wolters et al., 2003) 我試著把英文論文摘要寫作連結到某件我喜歡做或是我覺得有趣的事情。</p> <p>57. I think up situations where it would be helpful for me to be capable of writing English RA-abstract. (Present my papers in conferences or submit my papers to journals) (adapted from Wolters et al., 2003) 我想出一些情境，在那些情境中有能力寫英文論文摘要對我會有幫助。(譬如在研討會口頭發表論文、投上期刊論文等。)</p> <p>59. I keep telling myself that I want to do better than others in English RA-abstract writing (adapted from Wolters et al., 2003) 在寫英文論文摘要時，我不斷告訴自己要做得比別人更好。</p> <p>61. I promise myself some kind of a reward if I get my English RA-abstract writing done. (adapted from Wolters et al., 2003) 我承諾自己，如果把英文論文摘要寫完的話，將給自己某種獎賞。</p> <p>63. I tell myself that I can do something I like later if right now I write an English RA-abstract that I have to get done. (adapted from Wolters et al., 2003) 我告訴我自己，如果立刻寫一篇必須完成的英文論文摘</p> | <p>56. When writing my English RA-abstract, I consult expert works of RA-abstract in my field. (adapted from Petrić & Czarl, 2003) 在寫英文論文摘要時，我參考自己領域內專家所寫的摘要。</p> <p>58. I revise my English RA-abstract based on the feedback on my abstract that I get from NS, my advisor, more proficient writers, or reviewers. (adapted from Petrić & Czarl, 2003) 我根據英語母語者、指導教授、經驗更老道的作者、或是審稿者所給我的意見回饋，來修改我的英文論文摘要。</p> <p>60. I leave my English RA-abstract aside for a couple of days and then I can see it from a new perspective. (adapted from Petrić & Czarl, 2003) 我把自己的英文論文摘要放在一旁幾天，然後再以新的角度來審視。</p> <p>62. When the English RA-abstract writing is difficult, I don't give up and I don't just learn the easy parts. (adapted from Wolters et al., 2003). 當寫英文論文摘要變得困難時，我不會放棄，我也不會只學簡單的部份。</p> <p>64. I use a NS at various stages of drafting of my English RA-abstract. (adapted from Flowerdew, 1999) 在寫英文論文摘要的不同階段中(像是擬初稿、二稿、定稿時)，我求助英語母語者。</p> <p>65. I make use of help from</p> |

- dictionary) (adapted from Petrić & Czarl, 2003)
寫英文論文摘要時，如果我不懂一個英文字的使用法，我使用各種有效的用字策略(像是馬上查字典、先寫中文、或是寫簡單的英文)，以表達自己的想法。
41. I re-read what I have written in my English RA-abstract to get ideas on how to continue (adapted from Petrić & Czarl, 2003)
寫英文論文摘要時，我重讀已完成的部分來想如何往下寫。
42. I re-read and revise my English RA-abstract to improve the clarity of ideas in my RA-abstract. (adapted from Petrić & Czarl, 2003).
我重讀並修改自己的英文論文摘要，以提昇摘要文意的清楚度。
43. I re-read and revise my English RA-abstract to improve the organization (type and length of rhetorical moves) in my RA-abstract. (adapted from Petrić & Czarl, 2003).
我重讀並修改自己的英文論文摘要，以改善其組織結構。
44. I re-read and revise my English RA-abstract to improve the accuracy of lexico-grammatical patterns in my RA-abstract. (adapted from Petrić & Czarl, 2003).
我重讀並修改自己的英文論文摘要，以提昇摘要中單字文法用法的正確性。
45. I re-read and revise my English RA-abstract to improve the appropriateness of lexico-grammatical patterns in my RA-abstract, so as to conform to the convention of academic English on effective wording and condensed structures. (adapted from the informants’
要，稍後就可以做自己喜歡的事。
66. I try to make the English RA-abstract writing seem more useful by relating it to what I want to do in my life. (adapted from Wolters et al., 2003)
藉由連結到我一生中想做的事情，我試著讓英文論文摘要寫作變得似乎更有用。
68. I tell myself that I should work on English RA-abstract writing at least as hard as other students. (adapted from Wolters et al., 2003)
我告訴自己，至少應該像其他同學一樣努力地寫英文論文摘要。
70. I make myself work harder in writing English RA-abstract by comparing what I’m doing to what other students are doing. (adapted from Wolters et al., 2003)
透過比較自己與其他同學在做的事，我讓自己更努力地寫英文論文摘要。
72. I set a goal for how much I should achieve in English RA-abstract writing and promise myself a reward if I reach that goal. (adapted from Wolters et al., 2003)
我設定自己該達成的英文論文摘要寫作目標，然後承諾自己若能達成該目標，就給自己一個獎賞。
- expert writers in reviewing my English RA-abstract. (adapted from Flowerdew, 1999)
我請經驗老道的作者來檢視我的英文論文摘要。
67. I use a dictionary (paper and/or electronic dictionary/collocation or grammar dictionary) when writing my English RA-abstract. (adapted from Petrić & Czarl, 2003)
在寫英文論文摘要時，我會查字典(紙本、電子、網路字典/搭配詞、文法字典)。
69. I make a timetable for my English RA-abstract writing to ensure that I complete it in time. (adapted from Petrić & Czarl, 2003)
在寫我的英文學術論文摘要時，我制定一個時間表，以確保我可以即時寫完。
71. Even when the English RA-abstract writing is dull and uninteresting, I manage to keep working until I finish. (adapted from Wolters et al., 2003)
即使寫英文論文摘要乏味的、無趣的，我仍設法繼續寫完。
73. I make sure I keep up with the routine learning of the English RA-abstract writing (e.g. daily, weekly or monthly plans for learning RA-abstract writing). (adapted from Wolters et al., 2003)
我確保自己規律地學習英文論文摘要的寫作。
74. I often find that I spend enough time on the English RA-abstract writing despite the possibility of doing other activities. (adapted from Wolters et al., 2003).
即使有可能從事其它活動我發現自己大多會花充足的時間寫英文論文摘要。
75. I put my English RA-abstract

strategy)

我重讀並修改自己的英文論文摘要，以提昇摘要中單字文法用法的適切性，期能合乎學術英文強調用字簡潔與句型精鍊的傳統。

46. I relate the anticipated audience to my English RA-abstract by predicting the knowledge and attitudes the audience will have. (adapted from Flowerdew, 1999a)

經由預測讀者可能有的知識、態度，我讓預設的讀者和我的英文論文摘要產生連結。

47. In my English RA-abstract, I present knowledge claims with the caution expected by the academic community. (adapted from Flowerdew, 1999a)

在我的英文論文摘要中，我會按照學術社群所預期，小心謹慎地呈現論點（像是使用一些謹慎語 may, could, probably, likely, etc，來降低論點的主觀性。）

48. I write my English RA-abstract conforming to the conventions of word limit for an abstract in my discipline. (adapted from Swales & Feak, 2009)

寫英文論文摘要時，我會遵循自己領域對摘要字數設限的慣例。

49. I write my English RA-abstract with the rhetorical moves (e.g., purpose statement, method, results) that are necessary in my discipline. (adapted from Swales & Feak, 2009)

寫英文論文摘要時，我依據自己學科必備的言步來撰文。（言步是指修辭上的言談步驟，摘要中言步是指研究背景、目的、方法、結果等的陳述）。

into different formats (e.g. word, online documents, or hardcopy,) to better revise content and lexico-grammatical mistakes of my abstract.

(adapted from the informants' strategy)

我把自己的英文論文摘要放在不同的格式中(像是 word 檔，網路文件檔，或是紙本)，以利於修改內容或是修改單字文法錯誤。

50. I write my English RA-abstract with each move (element) in the length appropriate to my discipline. (adapted from Swales & Feak, 2009)

寫英文論文摘要時，我讓每個言步的長度符合自己學科領域的傳統。(譬如確定每個言步，也就是**研究背景、目的、方法、結果等的陳述**不會過長，以免佔掉太多篇幅。)

51. In my English RA-abstract, I appropriately use the main tense options of present (e.g., for the moves of background, aim and conclusion) and past (e.g., for the moves of method and results). (adapted from Swales & Feak, 2009)

在我的英文論文摘要中，我適當地使用過去式與現在式等主要時態（像是研究背景與結論的言步用現在式，研究方法與結果的言步用過去式）。

52. I sufficiently highlight the main findings in my English RA-abstract. (adapted from Swales & Feak, 2009)

在我的英文論文摘要中，我充分地強調主要的發現。

53. I make acronyms or abbreviations (if any) understandable throughout my English RA-abstract. (adapted from Swales & Feak, 2009)

在我整篇英文論文摘要中，我會讓讀者能看懂其中的頭置詞或縮寫(譬如 RA 代表 research articles)。

54. In my English RA-abstract, I make each move contain the most important information. (adapted from the informants' strategy).

在我的英文論文摘要中，我讓每個言步都含有最重要的訊息（像是最重要的研究背

Examination of the psychometric properties of SWSI. To ensure SWSI demonstrating solid psychometric properties for the constructs investigated, a series of reliability and validity analyses of the questionnaire was conducted.

In the phase of questionnaire development, establishing content validity of the questionnaire is of great importance. As mentioned earlier, the preliminary 39-items in SWSI were adapted from previous studies. To validate these 39 items, a focus group was formed by 2 doctoral students in business and education; they had some experiences in writing RA abstracts. The focus group commented the items of SWSI in terms of relevance of the items to the study purpose, and potential problems of wording and interpretation. That is, the focus group responded to whether and how the items adequately reflected the RA-abstract writing strategies they used, and whether they interpreted the items in a manner corresponding to the way the items were developed. In this way, preliminary support for the content validity was obtained.

Further, reliability and validity evidence was collected through the pilot study with 255 participants. In the pilot study, the reliability of SWSI was evaluated by item analysis and internal consistency. For each subscale of SWSI, item analysis was conducted by: (a) computing descriptive statistics (i.e., mean and standard deviation), (b) correlating item score with the sum of all the items in the subscale (i.e., corrected item-sum correlation), and (c) computing a series of Cronbach alpha coefficients for each of the three subscales with one item being deleted at a time. Also, Cronbach alpha coefficient was computed for each of the three subscales of the writing strategy questionnaire. Reliability analyses on the three subscales of SWSI are presented below.

For the Cognition Regulation subscale, the means of the 18 items ranged from 3.50 to 4.11; the standard deviations ranged from 0.66 to 0.93. The corrected item-sum

correlation coefficients ranged from .42 to .74, except for Item 38, which had a coefficient of .16 (see Table 15). The Cronbach alpha coefficients being computed by deleting one item at a time ranged from .90 to .91 (except for Item 38 with the coefficient .92), equal to or lower than the Cronbach alpha coefficient for the entire subscale (.91). These results of reliability analyses indicate that the Cognition Regulation subscale has good reliability in terms of internal consistency, except for Item 38 that was further examined by CFA below.

Table 15

Descriptive Statistics of the Cognition Regulation Subscale

| Item | <i>M</i> | <i>SD</i> | Corrected Item-sum correlation | Cronbach alpha when an item deleted |
|--|----------|-----------|--------------------------------------|---|
| 37. In writing English research-article (RA) abstracts, I select the most important information from my entire RA (either using my native language or English to select and think). | 4.11 | 0.66 | .48* | .91 |
| 38. I simplify what I want to say in my English RA-abstract if I don't know how to express my thoughts in English. | 3.59 | 0.86 | .16* | .92 |
| 39. I read model sentences in published English RA-abstracts (e.g. journal articles, book chapters, or conference proceedings), and make similar sentences for my own English RA-abstract. | 3.75 | 0.76 | .42* | .91 |
| 40. If I don't know an English word in my RA-abstract writing, I make sure I get my meanings across by use of varying effective strategies for word usage (e.g., look up the dictionary on the spot; write it in my native language or use a similar English word, and later look up the dictionary) | 4.05 | 0.76 | .58* | .90 |
| 41. I re-read what I have written in my English RA-abstract to get ideas on how to continue. | 4.00 | 0.74 | .60* | .90 |
| 42. I re-read and revise my English RA-abstract to improve the clarity of ideas in my RA-abstract. | 4.10 | 0.75 | .74* | .90 |
| 43. I re-read and revise my English RA-abstract to improve the organization (type and length of rhetorical moves) in my RA-abstract. | 4.07 | 0.77 | .72* | .90 |
| 44. I re-read and revise my English RA-abstract | | | | |

| | | | | | |
|-----|--|------|------|------|-----|
| | to improve the accuracy of lexico-grammatical patterns in my RA-abstract. | | | | |
| 45. | I re-read and revise my English RA-abstract to improve the appropriateness of lexico-grammatical patterns in my RA-abstract, so as to conform to the convention of academic English on effective wording and condensed structures. | 3.93 | 0.87 | .64* | .90 |
| 46. | I relate the anticipated audience to my English RA-abstract by predicting the knowledge and attitudes the audience will have. | 3.50 | 0.92 | .51* | .90 |
| 47. | In my English RA-abstract, I present knowledge claims with the caution expected by the academic community. | 3.77 | 0.90 | .57* | .90 |
| 48. | I write my English RA-abstract conforming to the conventions of word limit for an abstract in my discipline. | 3.88 | 0.91 | .60* | .90 |
| 49. | I write my English RA-abstract with the rhetorical moves (e.g., purpose statement, method, results) that are necessary in my discipline. | 4.02 | 0.76 | .61* | .90 |
| 50. | I write my English RA-abstract with each move (element) in the length appropriate to my discipline. | 3.96 | 0.79 | .61* | .90 |
| 51. | In my English RA-abstract, I appropriately use the main tense options of present (e.g., for the moves of background, aim and conclusion) and past (e.g., for the moves of method and results). | 3.67 | 0.76 | .50* | .90 |
| 52. | I sufficiently highlight the main findings in my English RA-abstract. | 4.02 | 0.71 | .62* | .90 |
| 53. | I make acronyms or abbreviations (if any) understandable throughout my English RA-abstract. | 3.76 | 0.93 | .56* | .90 |
| 54. | In my English RA-abstract, I make each move contain the most important information. | 3.88 | 0.78 | .65* | .90 |

Note. N=255. Cronbach alpha for the entire subscale = .91. * $p < .05$.

For the Motivation Regulation subscale, the means of the 9 items ranged from 2.84 to 3.55; the standard deviations ranged from 0.97 to 1.10; the corrected item-sum correlation coefficients ranged from .50 to .73 (see Table 16). The Cronbach alpha coefficients being computed by deleting one item at a time ranged from .85 to .87, equal to or lower than the Cronbach alpha coefficient for the entire subscale (.87). The result suggests that no improvements in the overall alpha coefficients could be made by

deleting any items from the subscale. These results of reliability analyses indicate that the Motivation Regulation subscale has good reliability in terms of internal consistency.

Table 16

Descriptive Statistics of the Motivation Regulation Subscales

| Item | <i>M</i> | <i>SD</i> | Corrected Item-sum correlation | Cronbach alpha when an item deleted |
|---|----------|-----------|--------------------------------|-------------------------------------|
| 55. I try to connect the English RA-abstract writing with something I like doing or something I find interesting. | 3.16 | 0.98 | .57* | .87 |
| 57. I think up situations where it would be helpful for me to be capable of writing English RA-abstract. | 3.42 | 0.98 | .50* | .87 |
| 59. I keep telling myself that I want to do better than others in English RA-abstract writing. | 3.26 | 0.97 | .55* | .87 |
| 61. I promise myself some kind of a reward if I get my English RA-abstract writing done. | 2.84 | 1.08 | .64* | .86 |
| 63. I tell myself that I can do something I like later if right now I write an English RA-abstract that I have to get done. | 2.97 | 1.01 | .68* | .86 |
| 66. I try to make the English RA-abstract writing seem more useful by relating it to what I want to do in my life. | 3.16 | 1.01 | .67* | .86 |
| 68. I tell myself that I should work on English RA-abstract writing at least as hard as other students. | 3.55 | 1.06 | .58* | .86 |
| 70. I make myself work harder in writing English RA-abstract by comparing what I'm doing to what other students are doing. | 3.16 | 1.10 | .61* | .86 |
| 72. I set a goal for how much I should achieve in English RA-abstract writing and promise myself a reward if I reach that goal. | 2.95 | 1.09 | .73* | .85 |

Note. N=255. Cronbach alpha for the entire subscale = .87. * $p < .05$.

For the Socio-Interactive Resources Regulation subscale, the means of the 12 items ranged from 2.91 to 4.28; the standard deviations ranged from 0.77 to 1.20; the corrected item-sum correlation coefficient ranged from .40 to .54 (see Table 17). The Cronbach alpha coefficients being computed by deleting one item at a time ranged from .79 to .80, lower than the Cronbach alpha coefficient for the entire subscale (.81),

which suggests that no improvements in the overall alpha coefficients could be made by deleting any items from the subscale. These results of reliability analyses indicate that the Socio-Interactive Resources Regulation subscale has good reliability in terms of internal consistency.

Table 17

Descriptive Statistics of the Socio-Interactive Resources Regulation Subscale

| Item | <i>M</i> | <i>SD</i> | Corrected Item-sum correlation | Cronbach alpha when an item deleted |
|--|----------|-----------|--------------------------------------|--|
| 56. When writing my English RA-abstract, I consult expert works of RA-abstract in my field. | 4.08 | 0.79 | .42* | .80 |
| 58. I revise my English RA-abstract based on the feedback on my abstract that I get from NS, my advisor, more proficient writers, or reviewers. | 4.04 | 0.86 | .47* | .80 |
| 60. I leave my English RA-abstract aside for a couple of days and then I can see it from a new perspective. | 3.28 | 0.90 | .43* | .80 |
| 62. When the English RA-abstract writing is difficult, I don't give up and I don't just learn the easy parts. | 3.64 | 0.81 | .49* | .80 |
| 64. I use a NS at various stages of drafting of my English RA-abstract. | 3.07 | 1.12 | .46* | .80 |
| 65. I make use of help from expert writers in reviewing my English RA-abstract. | 3.69 | 0.98 | .54* | .79 |
| 67. I use a dictionary (paper and/or electronic dictionary/collocation or grammar dictionary) when writing my English RA-abstract. | 4.28 | 0.77 | .40* | .80 |
| 69. I make a timetable for my English RA-abstract writing to ensure that I complete it in time. | 3.29 | 1.10 | .49* | .79 |
| 71. Even when the English RA-abstract writing is dull and uninteresting, I manage to keep working until I finish. | 3.71 | 0.96 | .47* | .80 |
| 73. I make sure I keep up with the routine learning of the English RA-abstract writing (e.g. daily, weekly or monthly plans for learning RA-abstract writing). | 2.91 | 1.00 | .48* | .79 |
| 74. I often find that I spend enough time on the English RA-abstract writing despite the possibility of doing other activities. | 3.09 | 1.00 | .48* | .80 |
| 75. I put my English RA-abstract into different formats (e.g. word, online documents, or hardcopy), to better revise | 3.22 | 1.20 | .42* | .80 |

content and lexico-grammatical mistakes
of my abstract.

Note. N=255. Cronbach alpha for the entire subscale =.81. * $p < .05$.

Table 18 reports Cronbach Alpha coefficients for the 3 subscales of SWSI ranging from .81 to .91. These coefficients all reach the desired level of .70, indicating SWSI has good reliability in terms of internal consistency.

Table 18

Cronbach Alpha of the 3 Subscales of SWSI

| Self-regulatory Writing Strategy Inventory (SWSI) | Cronbach alpha |
|---|----------------|
| Cognition Regulation | .91 |
| Motivation Regulation | .87 |
| Socio-Interactive Resources Regulation | .81 |

Evidence for construct validity of SWSI was also examined with the dataset in the pilot study. A confirmatory factor analysis (CFA) with robust maximum likelihood estimation was conducted on the 39 items of the SWSI, using LISREL 8.8 (Jöreskog & Sörbom, 1996). The CFA was used to confirm the hypothesized 3-factor structure suggested by Pintrich's (2004) self-regulatory learning and Oxford's (2011) self-regulatory L2 learning, including cognition regulation, motivation regulation, and socio-interactive resources regulation.

To present the fitness of this hypothesized factor structure, preliminary fit criteria and overall model fit (Schreiber et al., 2006; Hair et al., 2010) were examined. For the preliminary fit criteria, the factor loading of each item in the three subscales was obtained (see Table 19). Overall, most items demonstrated a satisfactory factor loading, ranging from .43 to .73. All of the items reached a statistically significant level. Yet, Item 38 had a loading at a relative low level, .18. It was kept in the SWSI for two reasons. First, deleting Item 38 did not improve the overall fit of the CFA model in question. Second, despite its low factor loading, Item 38 reached statistical significance,

indicating it had certain psychometric properties that may not be directly reflected either by factor loading or by the item-sum correlation coefficient.

Table 19

Factor Loading of the Items in the 3 Subscales of SWSI

| Item | Factor loading |
|--|-----------------------|
| Subscale: Cognition Regulation | |
| 37. In writing English research-article (RA) abstracts, I select the most important information from my entire RA (either using my native language or English to select and think). | .50* |
| 38. I simplify what I want to say in my English RA-abstract if I don't know how to express my thoughts in English. | .18* |
| 39. I read model sentences in published English RA-abstracts (e.g., journal articles, book chapters, or conference proceedings), and make similar sentences for my own English RA-abstract. | .43* |
| 40. If I don't know an English word in my RA-abstract writing, I make sure I get my meanings across by use of varying effective strategies for word usage (e.g., look up the dictionary on the spot; write it in my native language or use a similar English word, and later look up the dictionary) | .60* |
| 41. I re-read what I have written in my English RA-abstract to get ideas on how to continue. | .61* |
| 42. I re-read and revise my English RA-abstract to improve the clarity of ideas in my RA-abstract. | .70* |
| 43. I re-read and revise my English RA-abstract to improve the organization (type and length of rhetorical moves) in my RA-abstract. | .69* |
| 44. I re-read and revise my English RA-abstract to improve the accuracy of lexico-grammatical patterns in my RA-abstract. | .65* |
| 45. I re-read and revise my English RA-abstract to improve the appropriateness of lexico-grammatical patterns in my RA-abstract, so as to conform to the convention of academic English on effective wording and condensed structures. | .62* |
| 46. I relate the anticipated audience to my English RA-abstract by predicting the knowledge and attitudes the audience will have. | .53* |
| 47. In my English RA-abstract, I present knowledge claims with the caution expected by the academic community. | .59* |
| 48. I write my English RA-abstract conforming to the conventions of word limit for an abstract in my discipline. | .64* |

| Item | Factor loading |
|--|-----------------------|
| 49. I write my English RA-abstract with the rhetorical moves (e.g., purpose statement, method, results) that are necessary in my discipline. | .66* |
| 50. I write my English RA-abstract with each move (element) in the length appropriate to my discipline. | .68* |
| 51. In my English RA-abstract, I appropriately use the main tense options of present (e.g., for the moves of background, aim and conclusion) and past (e.g., for the moves of method and results). | .55* |
| 52. I sufficiently highlight the main findings in my English RA-abstract. | .67* |
| 53. I make acronyms or abbreviations (if any) understandable throughout my English RA-abstract. | .62* |
| 54. In my English RA-abstract, I make each move contain the most important information. | .70* |
| Subscale: Motivation Regulation | |
| 55. I try to connect the English RA-abstract writing with something I like doing or something I find interesting. | .58* |
| 57. I think up situations where it would be helpful for me to be capable of writing English RA-abstract. | .56* |
| 59. I keep telling myself that I want to do better than others in English RA-abstract writing. | .59* |
| 61. I promise myself some kind of a reward if I get my English RA-abstract writing done. | .55* |
| 63. I tell myself that I can do something I like later if right now I write an English RA-abstract that I have to get done. | .62* |
| 66. I try to make the English RA-abstract writing seem more useful by relating it to what I want to do in my life. | .73* |
| 68. I tell myself that I should work on English RA-abstract writing at least as hard as other students. | .70* |
| 70. I make myself work harder in writing English RA-abstract by comparing what I'm doing to what other students are doing. | .73* |
| 72. I set a goal for how much I should achieve in English RA-abstract writing and promise myself a reward if I reach that goal. | .67* |
| Subscale: Socio-Interactive Resources Regulation | |
| 56. When writing my English RA-abstract, I consult expert works of RA-abstract in my field. | .54* |
| 58. I revise my English RA-abstract based on the feedback on my abstract that I get from NS, my advisor, more proficient writers, or reviewers. | .54* |
| 60. I leave my English RA-abstract aside for a couple of days and then I can see it from a new perspective. | .48* |
| 62. When the English RA-abstract writing is difficult, I don't give up and I don't just learn the easy parts. | .57* |
| 64. I use a NS at various stages of drafting of my English RA-abstract. | .48* |

| Item | Factor loading |
|---|----------------|
| 65. I make use of help from expert writers in reviewing my English RA-abstract. | .54* |
| 67. I use a dictionary (paper and/or electronic dictionary/collocation or grammar dictionary) when writing my English RA-abstract. | .46* |
| 69. I make a timetable for my English RA-abstract writing to ensure that I complete it in time. | .56* |
| 71. Even when the English RA-abstract writing is dull and uninteresting, I manage to keep working until I finish. | .52* |
| 73. I make sure I keep up with the routine learning of the English RA-abstract writing (e.g., daily, weekly or monthly plans for learning RA-abstract writing). | .54* |
| 74. I often find that I spend enough time on the English RA-abstract writing despite the possibility of doing other activities. | .52* |
| 75. I put my English RA-abstract into different formats (e.g., word, online documents, or hardcopy), to better revise content and lexico-grammatical mistakes of my abstract. | .47* |

Note. N=255. * $p < .05$.

Correlations between the three latent variables in SWSI were computed to show whether these factors can be discriminated from each other (correlations cannot be too close to 1.00, and $< .95$). Table 20 reports the correlations among the three latent variables. The correlation between the Cognition Regulation and the Motivation Regulation was .37. The correlation between the Motivation Regulation and the Socio-Interactive-Resources Regulation .80; and the correlation between the Cognition Regulation and the Socio-Interactive-Resources Regulation was .71. The correlation results show that these three latent variables can be reasonably separated by the uniqueness each latent variable holds.

Table 20

Correlations among the Three Latent Variables in SWSI

| Subscales | 1 | 2 |
|---|------|------|
| 1. Cognition regulation | - | |
| 2. Motivation regulation | .37* | - |
| 3. Socio-interactive resources regulation | .71* | .80* |

Note. N=255. * $p < .05$.

For the overall model fit, this CFA model had a poor fit ($\chi^2(699) = 2136.41, p < .05$, normed χ^2 (i.e., χ^2/df ratio) = 3.06, RMSEA = .100, CFI = .90, NNFI = .90), suggesting the original model (called Model 1) might not adequately explain the data observed in the pilot study. To adequately explain the data, modifying the model for improvement in fit was a needed procedure. Thus, the model was modified on the basis of model modification indices in analysis. In particular, this model modification was made by estimating two sets of error-covariances in a sequential order, generating 3 models. Model 1 serves as the starting point, representing the original model with no error co-variances estimated. Then the first set of error-covariances was estimated by setting 6 error-covariances free, including the error-covariances between Items 42 and 43, between Items 42 and 44, between Items 42 and 45, between Items 43 and 44, between Items 43 and 45, between Items 44 and 45. With these 6 error-covariances estimated, Model 2 was yielded. On the basis of Model 2, the second set of error-covariances was estimated by setting additional 3 error-covariances free, including the error-covariances between Items 61 and 63, between Items 61 and 72, between Items 63 and 72. With the 9 error-variances in total estimated, Model 3 was yielded.

To examine the overall improvement in fit, comparisons were made between Models 1 and 2, and between Models 2 and 3 (see Table 21). The comparisons were mainly guided by five goodness-of-fit indices with their cutoffs (Hair et al., 2010): root-mean-square error of approximation (RMSEA, less than 0.08), comparative fit index (CFI, greater than or equal to 0.90 on the 0-1.0 scale), non-normed fit index (NNFI, close to 1 on the 0-1.0 scale), normed χ^2 (i.e., χ^2/df ratio) (ranging from 1 to 3), and the χ^2 difference statistic that is widely used to test nested models. That is, the modified models were subsets of the hypothesized model with a few additional parameters estimated. In this sense, the χ^2 difference statistic was used to test whether the overall improvement in fit had been achieved from Model 1, through Model 2, to

Model 3. From Model 1 to Model 2, χ^2 value showed a significant decrease of 259.23 at the expense of 6 degrees of freedom (i.e., a drop smaller than 5 of degrees of freedom is considered little improvement, when freely estimating a given parameter, Byrne, 1989; Gagne, Mikail, & D'Eon, 1995). From Model 2 to Model 3, χ^2 value showed a decrease of 156.13 at the expense of 3 degrees of freedom, indicating another significant improvement in fit. Besides the χ^2 difference statistic, goodness-of-fit indices for the three models are shown in Table 16. Across several indices, it appears that Model 3 with 9 item-based error co-variances reached an acceptable fit, with the fit indices below: ($\chi^2(690)=1721.05$, $p < .05$, normed $\chi^2=2.49$, RMSEA=.086, CFI=.93, NNFI=.93).

Table 21

Goodness-of-fit Indices for Models without and with Error-covariances

| Model | df | χ^2 | χ^2 diff | df diff | Normed χ^2 | RMSEA | CFI | NNFI |
|-------|-----|----------|----------------------|---------|-----------------|-------|-----|------|
| 1 | 699 | 2136.41 | - | - | 3.06 | .100 | .90 | .90 |
| 2 | 693 | 1877.18 | 259.23, $p < .05$ | 6 | 2.71 | .092 | .92 | .91 |
| 3 | 690 | 1721.05 | 156.13, $p < .05$ | 3 | 2.49 | .086 | .93 | .93 |

Note. N=255.

Apart from the goodness-of-fit indices, the choice of Model 3 with 9 item-based error co-variances drawn can be justified by two reasons. First, 6 item-based error covariances were drawn on Items 42, 43, 44, 45 in the Cognition Regulation subscale, indicating an additional latent variable not captured by the original model (Model 1). This additional latent variable may be attributed to a similar context phrased across Item 42 to Item 45, "I re-read and revise my English RA-abstract to." This context may account for a correlation among Items 42 to Item 45. Second, 3 item-based error

covariances were drawn on Items 61, 63, and 72 in the Motivation Regulation subscale, indicating another latent variable not captured by the original model (Model 1). This latent variable may be attributed to a similar event mentioned to motivate oneself, using an external reward. This reward event may account for a correlation among Items 61, 63, and 72. Even though these two newly-identified latent variables may be of less importance to the present study, they were reported to explain more variance in the data.

With the reliability analysis and the CFA results presented above, I tentatively concluded that the hypothesized factor structure was a good approximation to the data collected in the pilot study. That is, the three latent variables, cognition regulation, motivation regulation, and socio-interactive-resources regulation, can be measured by SWSI. Thus, I believed that SWSI could serve as a valid measure in the formal study.

The L2 literacy Test

Since the study aimed to translate the latent variable of L2 literacy into item measures for Taiwanese graduate students in applied linguistics, an effective battery of English proficiency test was needed. Among varying English proficiency tests, the study adopted the advanced level of General English Proficiency Test (the GEPT-advanced) developed by the Language Training and Testing Center (LTTC) for three reasons.

First, the study sought an L2 literacy test that was effective in differentiating learners of high levels of L2 literacy from those of less developed levels. Therefore, the study needed a test with items of higher difficulty because Taiwanese graduate students in applied linguistics are often more advanced in L2 literacy as compared to graduate students in other fields. The GEPT-advanced seems a feasible choice. According to a technical report (GEPT, 2002), the GEPT-advanced is designed for such test-takers as

English teachers, researchers, translators, etc., who need to be equipped with a high English proficiency. Moreover, passing the GEPT-advanced was specified as showing that the test-takers have equivalent English proficiency as graduates of English majors in undergraduate programs in Taiwan, or as graduates of other majors in master programs in English-speaking countries. Furthermore, Wu (2012), one of the major researchers at LTTC describes “[t]est-takers who pass the advanced level of General English Proficiency Test (GEPT)” as “able to communicate fluently in English with only occasional errors related to language accuracy and appropriateness, and to handle academic or professional requirements and situations” (p.19). Apparently, the GEPT-advanced targets the test-takers who are often graduates of English majors in undergraduate programs in Taiwan and have higher English proficiency than graduates of the other majors. The GEPT-advanced is thus suitable for the present study that recruited participants mainly from graduate students in applied linguistics, one of the most popular fields that undergraduates of English majors in Taiwan choose for post-graduate studies.

Second, the study sought an English proficiency test accessible for research purposes. Given issues of confidentiality, test developers in English-speaking countries seemingly hold more reservation in lending test items to researchers in EFL contexts (e.g., Taiwan). Actually, the researcher had applied for permission from Educational Testing Services (ETS) for the retired test items of TOEFL-Computer-Based Test (TOEFL-CBT), but the application failed. Meanwhile, although test developers of GEPT hold concerns over confidentiality issues as well, they show more openness to research. For instance, the official website of GEPT highly encourages using GEPT for studies on English learning in Taiwan. This researcher-friendly policy makes GEPT more accessible.

Third, the study sought an L2 literacy test that can be completed within an hour.

The L2 literacy test only accounted for one of the three parts in the research flow, which includes the L2 literacy test, the RA-abstract writing task, and two inventories. Since the flow appears time-consuming and cognition-demanding, it was less likely to administer an L2 literacy test that requires more than one hour.

Among varying English proficiency tests, the GEPT-advanced provides an ideal option, with a reading task lasting for 20 minutes and a writing task with a nonverbal prompt lasting for 45 minutes (GEPT, 2002). In fact, the reading tasks in the GEPT advanced consist of a careful reading task for 50 minutes and a skimming and scanning for 20 minutes. Careful reading has 20 items in short-answer format, while skimming and scanning has 20 items in multiple-choice format. The skimming and scanning task appears more applicable given the time limit. Likewise, the writing tasks in the GEPT-advanced consist of Task 1 and Task 2. Task 1 lasting for 60 minutes provides a verbal input and requires a response of 400 words, whereas Task 2 lasting for 45 minutes provides a nonverbal input (i.e., charts) and requires a response of 250 words (GEPT, 2002). Writing Task 2 appeared more applicable. Hence, writing Task 2 was adopted by requiring a shorter response of 200 words and cutting its response time from 45 to 35 minutes and for the study purposes. To sum up, the study adopted the GEPT-advanced as the L2 literacy measure, including a 20-minute skimming and scanning task and writing Task 2 for a 200-word response in 35 minutes (see Appendix C for Consent form for use of the GEPT-advanced).

Scoring of the L2 literacy test followed the scoring developed for the GEPT-advanced. That is, the 20 multiple-choice items of reading comprehension accounted for 20 points, while the essay test accounted for 5 points by a holistic scoring rubric released in a technical report on the GEPT-advanced (2002) (see Table 22).

Table 22

Scoring Rubric for the Essay Test in the GEPT-advanced

| Score Focus | 1 | 2 | 3 (Pass) | 4 | 5 |
|----------------------------|---|---|---|---|--|
| Relevance and Adequacy | <ul style="list-style-type: none"> ◆ text lacks relevance ◆ parts of the task not addressed. ◆ nearly all main ideas from the input are missing ◆ personal opinions are missing, not clearly stated or inappropriate to the task [pros & cons and conclusion, task 1; speculation on causes, and recommendations, task 2] | | <ul style="list-style-type: none"> ◆ almost entirely relevant ◆ all parts of the task are addressed ◆ may miss one or two main ideas from the input ◆ personal opinions are appropriate to the task and clearly stated [pros & cons and conclusion, task 1; speculation on causes, and recommendations, task 2] | | <ul style="list-style-type: none"> ◆ entirely relevant ◆ all parts of the task are addressed ◆ all main ideas from the input are covered ◆ personal opinions are appropriate to the task and effectively stated [pros & cons and conclusion, task 1; speculation on causes, and recommendations, task 2] |
| Coherence and Organization | <ul style="list-style-type: none"> ◆ text lacks logical organization which may lead to confusion ◆ inappropriate paragraphing ◆ limited/inappropriate use of linking devices | | <ul style="list-style-type: none"> ◆ text is logically organized in general ◆ appropriate paragraphing ◆ appropriate use of linking devices | | <ul style="list-style-type: none"> ◆ text is logically organized throughout ◆ appropriate paragraphing ◆ wide and appropriate use of linking devices |
| Lexical Use | <ul style="list-style-type: none"> ◆ range of vocabulary is inadequate to complete the tasks | | <ul style="list-style-type: none"> ◆ adequate range of vocabulary is used to complete the tasks ◆ there may be some | | <ul style="list-style-type: none"> ◆ wide range of vocabulary is used to effectively complete the |

| | | | |
|-----------------|---|--|--|
| | <ul style="list-style-type: none"> ◆ vocabulary is frequently used inappropriately ◆ inappropriate/mixed register, showing that the examinee is unable to distinguish between registers ◆ overt plagiarism [task 1]* | <ul style="list-style-type: none"> inappropriate use of vocabulary ◆ appropriate register with only occasional slips ◆ no plagiarism [task 1] | <ul style="list-style-type: none"> tasks. ◆ vocabulary is used appropriately. ◆ errors are rare. ◆ consistently appropriate register ◆ no plagiarism [task 1] |
| Grammatical Use | <ul style="list-style-type: none"> ◆ too limited a range of structures for task completion ◆ sentences/structures are frequently used inaccurately and/or inappropriately | <ul style="list-style-type: none"> ◆ an adequate range of structures for task completion ◆ there may be some inaccurate structures | <ul style="list-style-type: none"> ◆ effective use of a wide range of structures to complete the tasks ◆ structures are used accurately and appropriately. ◆ errors are rare. |

Note. Plagiarism: more than three consecutive words are copied from the input without appropriate quotation. Non-ratable compositions: A composition is considered "non-ratable" when (a) the length is shorter than 80 words, or (b) the content is totally irrelevant, or (c) the content is apparently a copy or memorization from other known materials, or (d) the handwriting is completely unintelligible. Non-ratable compositions will receive a final score of "0" and marks for the subcategories will not be reported.

For the essay test, two raters who were experienced teachers of English writing were invited, as detailed below.

Rating of the GEPT-advanced writing. The writing was rated by two female raters. Both of the raters held a master's degree in the program of Teachers of English to Speakers of Other Languages (TESOL) in Taiwan. They were experienced teachers and raters of English writing. In fact, they have had experiences in rating essays of

GEPT practice tests for 3 and 5 years respectively. They were thus considered relatively qualified for rating GEPT tests in the study. Both of the raters declined the remunerations, yet accepted a free meal and sustained friendship.

These two raters rated the essays on an equal proportion. Before the rating proceeded, a rater-training session was held as follows. First, the two raters read the writing prompt and scoring rubrics together to ensure they had a similar understanding on the rubrics. Second, they randomly selected 15 essays to rate on-site. Third, they discussed the rating results with each other and reconciled over discrepancy in rating. The rated essays thus provided benchmarks through Score 5 to Score 1 for the two raters to consult in the ensuing independent rating.

For independent rating, one-fourth of the essays (43 out of 170 essays) were randomly selected. These 43 essays were rated by both raters. Inter-rater reliability was computed by Cohen's Kappa, yielding a .924 coefficient. A Kappa coefficient higher than .70 indicates a good agreement held among the raters, .60 to .79 as substantial, and .80 and above as almost perfect, according to Landis and Koch (1977). Therefore, inter-rater reliability for the writing Task 2 in the GEPT-advanced was deemed quite sufficient. Every disagreement was subsequently reconciled by discussion. In addition to the 43 co-rated essays, the rest of the essays were equally distributed to the two raters, 64 and 63 respectively.

Research Abstract Performance Assessment (RAPA)

Research Abstract Performance Assessment (RAPA) consists of a RA-abstract writing task and two corresponding rating scales. First, the writing task was developed and administered to assess the participants' ability to write research-article abstracts. Second, two rating scales were developed via two stages, the advisor-guiding and the expert-reviewing stages. Developments of the writing task and the rating scales are

detailed below.

The RA-abstract writing task. Development of the RA-abstract writing task involved two parts of work, constructing the prompt of the writing task and pilot testing of the writing task.

The prompt of the writing task. The RA-abstract writing task was developed with a prompt written in the first language of the participants (i.e., Chinese), shown in Appendix D. The prompt was developed based on a research article that evaluates the effects of a web-based discussion forum on Taiwanese college students' learning of English language and content-based knowledge. This RA was chosen because of its topic, language choice, and length. First, because the topic addresses English learning at the college level, it was deemed more relevant to the participants who were graduate students and might have more chances to be involved in English learning and teaching at the college level. Second, this RA is written in Chinese (L1 of the participants), rather than in English. When serving as a prompt for the timed abstract-writing test, this RA prevented the participants from directly copying English language expressions; it requires the participants to demonstrate their ability to write RA-abstracts in English based on the contents written in Chinese. Third, the RA has a manageable length (i.e., 10 pages) and could be transformed into a writing prompt that enables the participants to complete a reading-to-write task under a 60-minute limit.

The prompt contained informative details related to the conventional sections of Introduction, Method, Results, and Discussion of the study. However, no explicit section headings were provided to eliminate the possibility of implying a need to write the abstract with information taken from these sections. These sections form move structure of RA abstracts and were transformed into the rating criteria of the RA-abstract task in the study. In addition, the prompt supplies English key words for the article, so that the participants could use it as the reference to complete the test.

With the RA, the prompt required the participants to write an abstract. The abstract was required to have a length of 200 to 250 words.

Pilot testing the RA-abstract writing task. In the pilot test, five graduate students in the field of applied linguistics from National Taiwan Normal University were invited to write the RA-abstract task. The five graduate students consisted of two MA female students, one doctoral female student, and two doctoral male students.

Feedback from the five participants in the pilot study was collected from the interviews that followed the writing task. The feedback was adopted to revise the writing prompt of the RA-abstract task. Quite a few points were revised on this writing prompt. First, the writing task was originally named as an RA-abstract “test” in the pilot study, but it was renamed as an RA-abstract writing task for the formal study to reduce possible anxiety that might be triggered by the word “test.” Second, the full RA was used as the prompt in the pilot study; however, the section of literature review was deleted for the formal study to reduce the reading load of the participants. Third, in the pilot study, the participants were required to write an abstract presenting the significance and contribution of the RA. This requirement was removed to give the participants more freedom in writing. Fourth, the required length of abstract was reduced from 200 to 250 words in the pilot study to a length of 150 to 200 words in the formal study. Finally, more time was given to complete the writing task; the time limit increased from 50 minutes in the pilot study to 60 minutes in the formal study. With the five changes made on the basis of the participants’ feedback, the RA-abstract task might be more accomplishable in the formal study.

The two rating scales. The two rating scales were mainly developed against the backdrop of the genre theory (Swales, 1990; Swales & Feak, 2009). Specifically, Swales and Feak (2009, 2010) state that abstracts of research articles can be analyzed by two structures, global rhetorical moves and local lexico-grammatical patterns. In this

vein of thinking, the abstracts were evaluated by two rating scales: the global structure of rhetorical moves (i.e., the presence and contents of Background-Purpose-Method-Results-Conclusion of communicative acts in abstracts), termed as the global move scale here; and the local structure of lexico-grammatical patterns (i.e., accuracy and appropriateness for choice and usage of words), termed as the local pattern scale here. The rating scales ranged from score 5 to score 0. A high score corresponds to a high performance in global move or local pattern. The two scales of global move and local pattern served as a blueprint. Further development of the scales is detailed below.

Development of the two rating scales. Two main stages were involved in development of the two rating scales, the advisor-guiding stage and the expert-reviewing stage.

First in the advisor-guiding stage, the scales were drafted under the guidance of two advisors of the researcher. The two advisors were faculty members in the fields of Teachers of English to Speakers of Other Languages (TESOL) and Educational Psychology respectively. They advised on components and wording of the rating scales. In particular, the advisor in the educational psychology field specialized in measurement and research method. He taught expertise in components of rating scales including criteria (i.e., key aspects of assessment, such as presence and proportion of moves; accuracy and appropriateness of language-use), levels (i.e., scoring range, such as scores 0 to 5), and descriptors (i.e., descriptions that characterize each score) (Becker, 2011; Jonsson & Svingby, 2007; Stoller et al., 2005; Unock, 2010). Following this teaching, the two scales were drafted by adapting the criteria of scoring, levels of score, and score descriptors from the rating scales available in literature.

For criteria of scoring, the move criterion in the global-move scale was adapted from Stroller et al.'s (2005) holistic scale that evaluates chemistry undergraduates' writing by rhetorical moves and other linguistic features. The language-use criterion in

the local-pattern scale was adapted from the scoring rubrics for independent writing in TOEFL Internet-based test (IBT) (ETS, 2008). For levels of score, Stroller et al.'s scale (2005) ranged from score 6 to score 1, while the IBT scale ranged from score 5 to score 0. To make the scoring of the present study more comparable to the TOEFL or other English proficiency tests (e.g., the GEPT-advanced), the study adopted the score range from 5 to 0. Moreover, an overall rating standard for each score was adopted from the IBT rubrics and revised, such as the standard for scores 5 and 4 running as *An abstract at this level accomplishes all of the following*, and the standard for score 3 as *An abstract at this level is marked by one or more of the following*.

With the criteria and level of scores selected, the criteria were specified by sub-criteria. In particular, the move criterion was specified with four sub-criteria: presence (Swales & Feak, 2009), proportion (Hsieh & Liou, 2008), sequence (Swales & Feak 2004, 2009), and coherence (ETS, 2008). The language-use criterion was specified as accuracy on lexico-grammatical use (ETS, 2008), and appropriateness on hedging and booster (Hyland, 2000; Swales & Feak, 2004). Then, each sub-criterion was phrased into descriptors on each score level.

In addition to the criteria of move and language-use in the two scales, the two advisors advised to add criteria of content and brevity to the two scales respectively. These two newly-added criteria merited attention because they addressed requirements the writing prompt made for the response, that is, a less-than-200-word abstract for a study on computer assisted language learning. First, since the study was clearly presented in the prompt, it was feasible to evaluate what contents of the study the participants selected and composed into their abstracts. The contents of the abstracts were evaluated in terms of accuracy and effectiveness. Moreover, according to word limit set in the prompt, it was reasonable to evaluate brevity of the abstracts (i.e., the evaluation addressed limits on words and paragraphs at that time).

To express the content and brevity criteria as corresponding descriptors on each score, online search was conducted to locate rubrics that evaluated contents of research articles (Online materials 1). Accordingly, an earlier draft on the two rating scales was developed. The global move scale comprised criteria of move and content, and the local pattern scale comprised criteria of language-use and brevity.

Subsequently, the advisor in the TESOL field reviewed the criteria and scoring level of the scales. She further advised that the sub-criteria of brevity should be changed from the limit of 200-words and one-paragraph to conciseness and cohesiveness. Thus, the scoring might focus on brevity at a deeper level, rather than at a surface level. To express the sub-criteria of conciseness and cohesiveness as descriptors, online search was conducted to locate rubrics that evaluated conciseness and cohesiveness of writing (Online materials 2 & 3). Moreover, to make development of the two scales a relatively objective process, she suggested that scale revision should mainly follow the comments that three to-be-consulted reviewers make. Specifically, the two advisors suggested that the rating scales should be reviewed for refinement by 3 professors in the TESOL field.

In the expert-reviewing stage, three professors in the TESOL field were invited as reviewers for the two rating scales. The review proceeded with semi-structured interview that presented the two scales in a checklist (see Appendix E), rationales for behind the two scales (see Appendix F), and called for comments. Then the review proceeded with ensuing emails to ensure that the reviewers' comments were adopted accurately in revision. With this review procedure, the three reviewers were consulted sequentially. One reviewer was consulted at a time to ensure the scales could be revised in a consistent and precise manner.

The review sequence ran as follows (see Table 23 for review details). First, the checklist and the rationales behind the rating scales were given to an assistant professor

specialized in writing of English research articles. Throughout interview, she agreed upon most parts of the two scales in checklist. Then, she advised to specify the language-use criterion by two sub-criteria: Accuracy on lexico-grammatical use, and appropriateness on vocabulary range, syntactic variety, and hedging and booster. Also, she advised to revise some wording of criteria and descriptors (e.g., from *move existence* to *move presence*). Second, the rating scales alongside the rationales were given to a full professor specialized in English writing of research abstracts. Throughout the interview, she also agreed upon most parts of the two scales in checklist. She advised to revise some descriptors on overall rating standard for each score. She also indicated that a sharp gap appeared in descriptors of Score 3 to 2 in the language-use criterion. Third, the scales alongside the rationales were given to an associate professor specialized in development of questionnaire and scale. Throughout the interview, he also agreed upon most parts of the two scales in checklist. He then taught the skills in polishing the wording on the scales. After this first round of review, all the comments the three reviewers made were synthesized and highlighted in the two rating scales.

Next, the second review began. By email, the second review proceeded, following the same sequence of the first review. That is, Reviewer 1 looked through the revised parts, and expressed her opinions for agreement or modification. Subsequently, Reviewer 2 and Reviewer 3 did so. Opinions the three reviewers offered in the second review were also reported in Table 23.

Table 23

Three Reviewers' Comments for Scale Revision

| <i>First-Review</i> | Original Descriptors | Revised Descriptors |
|---------------------|--|---|
| 1.1 Reviewer 1 | <p>Scoring Sub-criteria</p> <p>Move: existence</p> <p>The local pattern: Language use</p> <p>The abstract</p> <p>Score 5</p> <p><u>-demonstrates syntactic variety, appropriate word choice, and idiomaticity, though it may have minor lexical or grammatical errors. (jargons are excluded from scoring)</u></p> <p>Score 4</p> <p><u>-demonstrates syntactic variety and range of vocabulary, though it will probably have occasional noticeable minor errors in structure, word form, or use of idiomatic language that do not interfere with meaning. (jargons are excluded from scoring) (IBT Independent writing)</u></p> <p>Score 3</p> <p><u>-displays accurate but limited range of syntactic structures and vocabulary</u></p> | <p>Scoring Sub-criteria</p> <p>Move: presence</p> <p>The local pattern: Language use</p> <p>The abstract</p> <p>Score 5</p> <p><u>-demonstrates consistent facility of language use in terms of syntactic variety, appropriate word choice, and idiomaticity. (jargons are excluded from scoring)</u></p> <p><u>-may have minor lexical or grammatical errors</u></p> <p>Score 4</p> <p><u>-demonstrates syntactic variety and range of vocabulary (jargons are excluded from scoring)</u></p> <p><u>-may have occasional noticeable minor errors in structure, word form, or use of idiomatic language that do not interfere with meaning</u></p> <p>Score 3</p> <p><u>-has noticeable minor errors in structure, word form, or use of idiomatic language</u></p> |
| 1.2 Reviewer 2 | <p>Overall rating standard</p> <p>Score 4:</p> <p><i>An abstract at this level <u>accomplishes all of the following:</u></i></p> | <p>Overall rating standard</p> <p>Score 4:</p> <p><i>An abstract at this level <u>mostly accomplishes all of the following:</u></i></p> |

| | | |
|----------------------|--|--|
| | Score 0: <i>An abstract at this level is seriously flawed by one or more of the following</i> | Score 0: <i>An abstract at this level is seriously flawed <u>and barely comprehensible</u> by one or more of the following</i> |
| 1.3 Reviewer 3 | The global move: Move Score 3 <u>Few moves have minor</u> problems, such as <u>out of proportion</u> (e.g., too much in background or method), <u>underdeveloped</u> , or <u>out of sequence</u> . | The global move: Move Score 3 <u>Moves have some</u> problems, such as <u>disproportion</u> (e.g., too much in background or method), <u>underdevelopment</u> , or <u>non-sequence</u> . |
| | Score 2 Some moves have problems such as <u>out of proportion</u> (e.g., too much in background or method), <u>underdeveloped</u> , or <u>out of sequence</u> . | Score 2 Some moves have problems such as <u>disproportion</u> (e.g., too much in background or method), <u>underdevelopment</u> , or <u>non-sequence</u> . |
| | Score 1 Most moves have major problems, such as <u>out of proportion</u> , <u>underdeveloped</u> , or <u>out of sequence</u> . | Score 1 Most moves have major problems, such as <u>disproportion</u> (e.g., too much in background or method), <u>underdevelopment</u> , or <u>non-sequence</u> . |
| Second-Review | The Local Pattern: Language Use The abstract Score 3 -demonstrates <u>ineffective use of</u> hedging and booster. | The Local Pattern: Language use The abstract Score 3 -demonstrates <u>partially appropriate use of</u> hedging and booster. |
| | Original Descriptors | Revised Descriptors |
| 2.1 Reviewer 1 | The Global move: Move Score 3 | The Global move: Move Score 3 |

Moves have some problems, such as disproportion (e.g., too much in background or method), underdevelopment, or non-sequence.

Score 2

Some moves have problems such as disproportion (e.g., too much in background or method), underdevelopment, or non-sequence.

Score 1

Most moves have major problems, such as disproportion (e.g., too much in background or method), underdevelopment, or non-sequence.

Overall rating standard

Score 3

An abstract at this level is marked by one or more of the following:

Score 2

An abstract at this level reveals one or more of the following:

Score 1

An abstract at this level is seriously flawed by one or more of the following weaknesses

Score 0

An abstract at this level is seriously flawed and barely comprehensible by one or more of the following:

Moves exhibit few problems, such as disproportion (e.g., too much in background or method), underdevelopment, or non-sequence.

Score 2

Moves exhibit some problems, such as disproportion (e.g., too much in background or method), underdevelopment, or non-sequence. (e.g., background-purpose-method-results-conclusion)

Score 1

Moves exhibit major problems, such as disproportion (e.g., too much in background or method), underdevelopment, or non-sequence.

Overall rating standard

Score 3

An abstract at this level is marked by some of the following:

Score 2

An abstract at this level reveals many of the following:

Score 1

An abstract at this level is seriously flawed by revealing the following weaknesses:

Score 0

An abstract at this level is seriously flawed and barely comprehensible by revealing the following weaknesses:

| | | |
|--------------------|---|---|
| 2.2. Reviewer 2 | <p>The global move: Move Score 3</p> <p>Moves exhibit few problems, such as disproportion (e.g., too much in background or method), underdevelopment, or <u>non-sequence</u>.</p> <p>Score 2</p> <p>Moves exhibit some problems, such as disproportion (e.g., too much in background or method), underdevelopment, or <u>non-sequence</u>. (e.g., background-purpose-method-results-conclusion)</p> <p>Score 1</p> <p>Moves exhibit major problems, such as disproportion (e.g., too much in background or method), underdevelopment, or <u>non-sequence</u>.</p> <p>The global move: Content Score 2</p> <p>If provided, research backgrounds and conclusions are only <u>limitedly</u> summarized, and some points are irrelevant, omitted, or imprecise.</p> | <p>The global move: Move Score 3</p> <p>Moves exhibit few problems, such as disproportion (e.g., too much in background or method), underdevelopment, or <u>being out of logical sequence</u>.</p> <p>Score 2</p> <p>Moves exhibit some problems, such as disproportion (e.g., too much in background or method), underdevelopment, or <u>being out of logical sequence</u>. (e.g., background-purpose-method-results-conclusion)</p> <p>Score 1</p> <p>Moves exhibit major problems, such as disproportion (e.g., too much in background or method), underdevelopment, or <u>being out of logical sequence</u>.</p> <p>The global move: Content Score 2</p> <p>If provided, research backgrounds and conclusions are only <u>summarized in a limited way</u>, and some points are irrelevant, omitted, or imprecise.</p> |
| 2.3. Reviewer 3 | | None |

Throughout the stages of advisor-guiding and expert-reviewing, the two rating scales were developed incrementally (see Appendix G).

Rating procedure of the RA-abstracts. Rating procedure of the RA-abstracts included four steps, selection of content elements, move coding, rater training, and rating. First, content elements were selected according to the key elements of abstracts suggested by Publication Manual of the American Psychological Association Sixth Edition (APA, 2010). Second, the abstracts were move-coded to reveal distribution of varying moves in each abstract. Third, a few move-coded abstracts were randomly selected by the two raters for rater training that sought a consensus of the two raters' rating. Specifically, the rating adopted the selected content elements, in addition to the criteria of move, language use, and brevity. Fourth, the two raters rated the move-coded abstracts independently. Details are reported below.

Selection of content elements. The essential content elements of the abstracts were selected by journal article reporting standards for APA publication (APA, 2010). These elements comprised problems under investigation; participants; study method including sample size, any apparatus used, outcome measures, data-gathering procedure, research design; and findings including effect sizes or statistical significance levels (APA, 2010, p. 245). These elements were located according to the prompt of the RA-abstract writing task in the study, and then reviewed by the professor rater and another full professor who specializes in CALL with extensive publications. Accordingly, the essential content elements for the abstracts were finalized for rating to proceed. Specifically, these content elements were carefully checked in each rating.

Move Coding. As shown in Table 24, a coding scheme of rhetorical moves (adopted from Swales & Feak, 2009) was employed to code the abstracts the participants wrote. The moves included the communicative acts of providing background or literature review (B), indicating purposes or tasks of the study (P), describing methods or theories (M), reporting results (R), and making conclusions and evaluations (C). In addition, an additional move generated from the abstracts was a

communicative act of blending purposes with method (P + M). This move was added to Swales and Feak's (2009) coding scheme.

Table 24

Coding Scheme of Rhetorical Moves in Abstracts

| Moves | Coding |
|--|--------|
| Background information or literature review | B |
| Purpose | P |
| Method | M |
| Results | R |
| Partial or complete conclusion, evaluation (including value) | C |
| Purpose + Method (a newly added label in the study) | P+M |

This coding scheme was employed in a coding procedure. To ensure move-coding to be reliable, three coders and one professor in the TESOL field were involved. In particular, two coders with a MA degree in TESOL and the researcher coded a number of abstracts. The two coders were invited because of the topics of their MA thesis. One had the topic on computer assisted language learning, making him more likely to be familiar with contents of the CALL study presented in the writing prompt. This content familiarity may contribute to his better ability to identify rhetorical moves in the abstracts. The other coder had the MA thesis topic on move analysis of journal articles in the field, making her more familiar with coding the abstracts by rhetorical moves. Similarly, the researcher had a handful of experiences in coding research articles by rhetorical moves. Finally, the invited professor has published a number of international journal articles on teaching RA-abstract writing by rhetorical moves. The coders and the professor involved were deemed relatively familiar with move-coding process.

The move-coding process proceeded as follows. First, the two coders were presented with the coding scheme in Table 24 and two move-coded RA-abstracts. The two coders discussed with the researcher to reach a consensus on how and why each move code was assigned. Second, three abstracts were used for practice of coding. In

this practice, the three coders categorized varying communicative acts in each abstract into potential moves (e.g., a move may spread over a sentence or sentences). The coders then carefully reviewed word choices and other linguistic signals in each potential move before finalizing the coding. After this coding practice, the three coders discussed to reconcile the disagreement over location and number of moves. In fact, this reconciliation added a new code (i.e., move of Purpose + Method) to Swales and Feak's (2009) coding scheme, as shown in Table 24. Moreover, the new code and the three coded abstracts were presented to the professor. The professor generally endorsed that this newly-added coding was appropriate.

Third, by the coding scheme in Table 24, around one-tenth of the abstracts in the study (i.e., 20 out of 185 abstracts) were coded independently among the three coders. The 20 move-coded abstracts were computed by Randolph's (2008) online kappa calculator for inter-coder reliability, in particular, Randolph's free-marginal multirater kappa (see Randolph, 2005; Warrens, 2010) that allowed more than two coders' ratings computed at the same time. Inter-coder reliability was computed on number and location of moves, yielding coefficients of .923 for the number, and .912 for the location (higher than .70 indicating a good agreement held among the coders, Randolph (2008)). Therefore, the inter-coder reliability was deemed quite sufficient. Every disagreement was subsequently reconciled by discussion. These 20 abstracts functioned as samples for coding the rest of the abstracts in the study. Fourth, the researcher move-coded the rest of the abstracts. These move codes generally marked distribution of moves in the abstracts. Thus, recognizing the move distribution becomes relatively easy (see Appendix H for an example). In this sense, raters of the abstracts might evaluate the quantity and quality of the moves in the abstracts with greater ease, generally promoting efficiency of their rating.

Raters. The RA abstracts were rated by two raters. One was the researcher herself. The other was an associate professor in the TESOL field. The professor specialized in CALL and published a few international journal articles, making her more than qualified for evaluating the abstracts regarding content accuracy and effectiveness. In fact, the content of the RA-abstract was expected to be highly related to CALL due to the prompt of the RA-abstract writing task. The prompt was a nearly full research article (only the literature review part was removed to prevent the participants from being overly-distracted) on a CALL study. Since the writing prompt addressed a CALL-related study, the professor rater was deemed fairly adequate in rating. Like the two raters of the general essays, the professor rater also declined the remunerations, yet accepted a free meal and sustained assistantship.

Rater-training. Before the grading proceeds, a rater-training session was held as follows. First, the two raters read the writing prompt and the two rating scales together to ensure they had a similar understanding on the prompt and the rating scales. Second, they randomly selected 15 abstracts to rate on-site. Third, they discussed the rating results with each other and reconciled over discrepancy in rating. The rated essays thus provided benchmarks through score 5 to score 1 for the two raters to consult in ensuing independent rating.

The rating. For the remaining abstracts, the professor rater rated half of them ($170/2=85$), while the researcher rated all of the abstracts. Inter-rater reliability was computed by Cohen's Kappa (used for the two raters), yielding a .923 coefficient for the global move and a .915 coefficient for the local pattern. A Cohen's Kappa coefficient higher than .70 indicates a good agreement held among the raters, .60 to .79 as substantial, and .80 and above as almost perfect, according to Landis and Koch (1977). Therefore, inter-rater reliabilities for RA-abstract writing were deemed quite sufficient. Every disagreement was subsequently reconciled by discussion.

To conclude, 4 measures (an L2 literacy test, two inventories, and research-abstract performance assessment) were employed to measure 12 observed variables representing 4 latent variables under investigation. Table 25 summarizes the above-mentioned measures, observed variables, and latent variables.

Table 25
Summary of the Measures for the Proposed Model

| Latent variables (latent constructs) | Observed variables (Indicators) | Items | Scales |
|---|--|---|---|
| 1. L2 literacy | 1.1 Reading ability | 20 multiple-choice items | 20 points |
| | 1.2 Writing ability | | |
| 2. Identity-based writing motivation | 2.1 Interest Value (5 items) | 25 | 5-point Likert scale Ranging from 1= “strongly disagree” to 5= “strongly agree” |
| | 2.2. Utility Value (5 items) | | |
| | 2.3 Cost (5 items) | | |
| | 2.4 Connectedness Value (5 items) | | |
| | 2.5 Ability Self-concept (5 items) | | |
| 3. Self- regulatory writing strategies | 3.1 Cognition Regulation(18items) | 39 | 5-point Likert scale Ranging from 1= “never true of me” to 5= “always true of me” |
| | 3.2 Motivation Regulation (9 items) | | |
| | 3.3 Socio-Interactive Resources Regulation (12items) | | |
| 4. RA-abstract writing ability | 4.1 Global move | 1 writing task scored by two scales | 5-point scale 5-point scale |
| | 4.2 Local pattern | | |

The Structural Equation Modeling Approach

The present study adopted the structural equation modeling (SEM) approach to test the hypothesized model by examining the compatibility of the model with the observed data. All of the latent variables and the hypothesized paths were analyzed. This process provided a set of models showing various indices, indicating how well the hypothesized model was supported by the data.

In particular, the SEM approach tested the model by analyzing the hypothesized structural relations among four latent variables and their corresponding observed variables (N=12). By Anderson and Gerbing's (1988) two-step rule, both the measurement model and the structural model were tested. The measurement model refers to how well latent variables can be represented by observed variables, while the structural model specifies direct and indirect effects among latent variables. The two-step rule tests not only whether all structure coefficients reach significant levels, but also to what extent the overall structural model fits the proposed model.

Specifically, in the measurement model, a number of indices were reported and its construct validity was tested by the aspects of convergent validity and discriminant validity. First, confirmatory factor analysis (CFA) on the four-factor structure was performed and the goodness-of-fit indices were reported. Second, correlations among the 4 latent variables, and factor loading and error-variance in each indicator were reported. Then, both composite reliability and Average Variance Extracted estimate (AVE) were calculated for convergent validity. Third, the AVE was compared to the squared correlations of the four latent variables for discriminant validity.

Furthermore, the adequacy of the proposed measurement and structural models were evaluated by a number of criteria: values of factor loadings and error variances,

theoretical rationales behind the choices of the constructs in the study, and the fit-indices of models. Among these criteria, the fit-indices of models are widely employed due to their easy accessibility.

As for which fit-indices of model need to be reported for initial analysis, Schreiber, Nora, Stage, Barlow, and King (2006) suggest root-mean-square error of approximation (RMSEA), comparative fit index (CFI), and non-normed fit index (NNFI, also known as Tucker-Luis Index, TLI). Besides these three fit indices, chi-square statistic (χ^2) as a fundamental statistic is always reported, although it is not uncommon to expect chi-square at a significant level due to the relative sensitivity of χ^2 statistic to the sample size (Hair, Black, Babin, & Anderson, 1998, 2010; Schreiber et al., 2006). To tackle this sensitivity issue, one of the popular alternatives to χ^2 statistic is the normed chi-square (χ^2/df) (Carmines & Mciver, 1981). Therefore, both for the pilot study and the formal study, the following statistics are reported, χ^2 , normed χ^2 , RMSEA, CFI, and NNFI.

Besides Schreiber et al's (2006) recommendation, the choices of these fit-indices are justifiable in SEM studies, categorized as absolute fit indices and incremental fit indices (Hair et al., 1998, 2010; Hooper, Coughlan, & Mullen, 2008). In particular, normed χ^2 and RMSEA are absolute fit indices that compare a prior model with no model at all, indicating how well the proposed model fits the sample data. Normed χ^2 is an alternative index for chi-square value; it minimizes the sensitivity issue that chi-square shows on large sample size, according to Wheaton et al. (1977). RMSEA is recognized as "one of the most informative fit indices" (Diamantopoulous & Siguw, 2000, p. 85), because it prefers parsimonious model with lesser parameters (Hair et al., 1998; Hooper et al., 2008). Meanwhile, CFI and NNFI are incremental fit indices that compare the chi-square value to a baseline model, rather than using the chi-square in its raw form. CFI assumes all latent variables are uncorrelated and compares the data

sample with this null model; it can perform well even on small-sized samples (Hair et al., 1998; Hooper et al., 2008). Similarly on small-sized samples, NNFI can indicate poor fit while other indices indicate good fit.

Moreover, these statistics were evaluated mainly by Hair et al.'s (2010) proposed cutoff criteria, rather than by Schreiber et al.'s (2006) because Hair et al. elaborated on the criteria in a rather updated and comprehensive manner. Table 26 displays Hair et al.'s (2010) cutoff criteria. First, χ^2 statistic should be ideally non-significant, although it is not uncommon to expect a significant one. Second, normed χ^2 should range from 1 to 3. Third, RMSEA should be less than .08, alongside a report on confidence interval. Fourth, CFI should be greater than or equal to .90 on the 0-1 scale. Fifth, NNFI should be close to 1 on the 0-1 scale.

Having detailed the cutoff criteria of the fit-indices, Hair et al. (2010) state that the cutoff criteria can be actually adjusted according to the model complexity and sample size. These five cutoff criteria were adopted when evaluating the models in the pilot study and the formal study.

Table 26

Cutoff Criteria of the Fit Indices Reported (according to Hair et al., 2010)

| Fit indices | Shorthand | Category | Cutoff values |
|---|------------------------------------|-----------------|---------------------------------|
| 1. Chi-square | χ^2 | absolute fit | low values, <i>ns.</i> |
| 2. Normed Chi-square | Normed χ^2 (χ^2/df) | absolute fit | Range: 1-3 |
| 3. Root Mean Square Error Approximation | RMSEA | absolute fit | <.08 (with confidence interval) |
| 4. Comparative Fit Index | CFI | incremental fit | >.90, on the 0-1 scale |
| 5. Non-Normed Fit Index | NNFI | incremental fit | Close to 1, on the 0-1 scale |

CHAPTER FOUR RESULTS

The chapter first reports descriptive statistics, including means, standard deviations, and zero-order correlations among the 12 indicators. Second, the chapter reports SEM analyses, in terms of the measurement model (i.e., confirmatory factor analysis and construct validity testing) and the structural model (i.e., overall model fit and regression coefficient to test the research hypotheses).

Descriptive Statistics

As presented in Chapter 3, the formal study included 185 participants who were L2 graduate students in master's and doctoral programs of applied linguistics in Taiwan. There were no missing data, making a sample size of 185 for descriptive and SEM analyses below.

Table 27 presents descriptive statistics of the 12 indicators, including means, standard deviations, Cronbach alphas, and correlation coefficients. The reading indicator was on a 0-20 scale, and showed a mean of 8.64 and a standard deviation of 4.46. The other 11 indicators were on a 0-5 scale. The means of these indicators ranged from 1.63 to 3.93, and their standard deviations ranged from 0.41 to 1.18.

Table 27 shows that Cronbach alpha coefficients for the 5 subscales of identity-based writing motivation inventory (IWMI) ranged from .80 to .90 in the formal study. These coefficients all reached the level of .70, indicating IWMI had good reliability in terms of internal consistency, similar to that in the pilot study (with a range from .78 to .88). In particular, item analysis on IWMI in the formal study was conducted (see Appendix I for the descriptive statistics).

Table 27 also shows that Cronbach alpha coefficients for the 3 subscales of self-regulatory writing strategy inventory (SWSI) ranged from .76 to .85 in the formal

study. These coefficients all reached the level of .70, indicating SWSI had good reliability in terms of internal consistency, similar to that in the pilot study (with a range from .81 to .91). In particular, item analysis on SWSI in the formal study was conducted (see Appendix J for the descriptive statistics).

In Table 27, the 12 indicators display correlation coefficients ranging from -.20, through 0, to .71. First, reading and writing as indicators for L2 literacy showed a coefficient of .49. Second, interest value, utility value, connectedness value, and ability self-concept as indicators for identity-based writing motivation showed coefficients ranging from .36 to .71. However, cost indicator showed a .09 coefficient with utility value and a .00 coefficient with connectedness value, suggesting that cost indicator may be unrelated to indicators of utility value and connectedness value. Third, cognition regulation, motivation regulation, and socio-interactive resources regulation as indicators for self-regulatory writing strategies showed coefficients ranging from .18 to .58. Fourth, global move and local pattern as indicators for RA-abstract writing ability showed a coefficient of .63. Cohen (1988) proposes to interpret coefficient by magnitude of effect size, interpreting coefficients of .10 as small, .30 as medium, and .50 as large magnitude of effect size. Except for cost indicator being unrelated to the indicators of utility value and connectedness value, the other 11 indicators in the study show small to large correlations with the rest of the indicators for the same latent variables, serving as a basis for holding a good measurement model in the study.

Finally, Table 27 reports Cohen's Kappa for inter-rater reliability of the grading on the two types of writing, .924 for the GEPT-advanced writing; .923 for the global move and .915 for the local pattern in the RA-abstract writing. A Cohen's Kappa coefficient ranges from -1.0 to +1.0. Overall, a Cohen's Kappa coefficient higher than .70 indicates a good agreement among the raters. Specifically, Landis and Koch (1977) propose to interpret Cohen's Kappa coefficient as below: .60 to .79 as substantial, and .80 and

above as almost perfect. In this sense, the grading on writing in the study shows a relatively high inter-rater reliability. Such high inter-rater reliability suggests that the raters rated homogeneously and consistently with guidance of the rating criteria, providing a piece of evidence for the reliability of the rating.

Table 27

Descriptive Statistics and Zero-order Correlations of the 12 Indicators in the Study

| Indicators | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|--------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|-----------|-----------|
| 1. Reading | - | | | | | | | | | | | |
| 2. Writing | .49** | - | | | | | | | | | | |
| 3. Interest value | .06 | .12 | - | | | | | | | | | |
| 4. Utility value | .12 | .15* | .53** | - | | | | | | | | |
| 5. Cost | .18* | .30** | .36** | .09 | - | | | | | | | |
| 6. Connectedness value | .10 | .04 | .45** | .71** | .00 | - | | | | | | |
| 7. Ability self-concept | .12 | .23** | .66** | .44** | .50** | .38** | - | | | | | |
| 8. Cognition regulation | .21** | .18* | .26** | .37** | .08 | .40** | .34** | - | | | | |
| 9. Motivation regulation | -.20** | -.18* | .21** | .15* | -.18* | .23** | .13 | .18* | - | | | |
| 10. Socio-resources regulation | -.04 | -.07 | .25** | .20** | -.09 | .31** | .20** | .48** | .58** | - | | |
| 11. Global move | .25** | .39** | .10 | .21** | .09 | .19* | .18* | .24** | -.10 | .07 | - | |
| 12. Local pattern | .24** | .40** | .13 | .23** | .10 | .16* | .24** | .14 | -.13 | -.03 | .63** | |
| <i>M</i> | 8.64 | 2.59 | 2.66 | 3.92 | 2.38 | 3.86 | 3.11 | 3.93 | 3.20 | 3.50 | 1.63 | 2.42 |
| <i>SD</i> | 4.46 | 0.86 | 0.76 | 0.70 | 0.74 | 0.62 | 0.66 | 0.41 | 0.69 | 0.51 | 1.18 | 0.90 |
| α | 0.81 | | 0.90 | 0.85 | 0.82 | 0.80 | 0.85 | 0.85 | 0.81 | 0.76 | | |
| <i>Kappa</i> | | 0.924 | | | | | | | | | 0.923 | 0.915 |

Note. $N=185$. * $p < .05$; ** $p < .001$.

When reporting SEM analysis on the proposed model, a two-step procedure recommended by Anderson and Gerbing (1988) was adopted. In the first step, a confirmatory factor analysis (CFA) was reported to reveal the quality of a measurement model. In the second step, the proposed model was tested against the collected data.

The Measurement Model

Goodness of Fit Indices

The measurement model purports to (a) specify the relationship of indicators and the latent variables (i.e., reading and writing indicators for L2 literacy latent variable; interest value, utility value, cost, connectedness value, and ability self-concept indicators for identity-based writing motivation; cognition regulation, motivation regulation, and socio-interactive resources regulation indicators for self-regulatory writing strategy; global move and local pattern indicators for RA-abstract writing ability) and (b) evaluate the extent to which the indicators can jointly serve as effective measures for the latent variables (Gagene, Mikail, & D'Eon, 1995; Lee, 2005). In fact, this relationship of indicators and the latent variables connects scores obtained from the measures with the underlying latent variables that the measures purport to assess. Thus, the measurement model specifies the pattern of how each indicator loads onto a designated latent variable (Gagene et al., 1995). Also, the measurement model evaluates these specified patterns together to reveal how well all the indicators can measure the hypothesized structure of the latent variables.

A confirmatory factor analysis (CFA) with maximum likelihood estimation was conducted on the 12 indicators of the four latent variables, using LISREL 8.8 (Jöreskog & Sörbom, 1996). The CFA was used to confirm the hypothesized 4-factor structure proposed by the study, including L2 literacy, identity-based writing

motivation, self-regulatory writing strategies, and RA-abstract writing ability.

As shown earlier in Table 26 in the Method chapter, the CFA model was evaluated by a few fit indices, including χ^2 (low values at a nonsignificant level), normed χ^2 (a range from 1 to 3), RMSEA (less than .08 with confidence interval reported), CFI (equal to .90 on the 0-1 scale), and NNFI (close to 1 on the 0-1 scale).

Statistically, the hypothesized CFA model had a poor fit ($\chi^2(48) = 213.89, p < .05$, normed $\chi^2 = 4.46$, RMSEA = .140, CFI = .83, NNFI = .76), suggesting the original model (called Model 1) might not adequately explain the data observed in the formal study. To adequately explain the data, modifying the model for improvement was a needed procedure. Thus, the model was modified on the basis of modification indices in analysis.

The modification index reflects an expected drop in chi-square (a drop smaller than 5.00 is considered little improvement in fit), when freely estimating a given parameter (Byrne, 1989; Gagne et al., 1995). Such test on the drop of chi-square is generally justifiable because the hypothesized model and the modified models were nested (i.e., the modified models were subsets of the hypothesized model with additional parameters specified). Specifying parameter is justifiable, particularly for the specifications on subscales of the same measure (Byrne, Shavelson, & Muthen, 1989; Byne, 1989; Gagne, et al., 1995; Lee, 2005). In this case, parameters often reflect non-random measurement error, which can be attributed to method effect on subscales of the same measure (Byrne et al., 1989; Gagne, et al., 1995). This method effect can often explain minor covariance not captured by the hypothesized model. In this vein of logic, the study proceeded on the model modification by covarying errors among subscales of the same instrument. As a result, the final model allowed two sets of errors to be covaried: one within subscales of identity-based writing motivation, and the other within subscales of self-regulatory writing strategies.

In particular, the model was modified by covarying two sets of errors in sequence, generating 3 models. Model 1 served as a start, representing the original model with no error-covariances at all. Then, the first set of errors was covaried by setting 3 error-covariances free; one at a time to ensure the drop of chi-square contributing to improvement in fit. In particular, this set included the error-covariances between interest value and cost, between cost and ability self-concept, and between utility value and connectedness value. With these 3 error-covariances estimated, Model 2 was yielded. On the basis of Model 2, the second set of errors was covaried by setting 1 additional error-covariance free, an error-covariance between cognition regulation and motivation regulation. With the 4 error-covariances in total estimated, Model 3 was yielded.

To examine the overall improvement in fit, comparisons were made between Models 1 and 2, and between Models 2 and 3 (see Table 28). Specifically, the comparisons on the three models were mainly guided by 5 fit-indices: χ^2 difference statistic, normed χ^2 , root-mean-square error of approximation (RMSEA), comparative fit index (CFI), and non-normed fit index (NNFI).

Specifically, the χ^2 difference statistic was used to compare the nested models regarding whether the overall improvement in fit had been made from Model 1, through Model 2, to Model 3 (a drop smaller than 5.00 is considered little improvement in fit, when freely estimating a given parameter) (Byrne, 1989; Gagne et al., 1995). From Model 1 to Model 2, χ^2 value showed a decrease of 99.48 at the expense of 3 degrees of freedom, indicating a significant improvement in fit. From Model 2 to Model 3, χ^2 value showed a decrease of 16.76 at the expense of 1 degree of freedom, indicating another significant improvement. Besides the χ^2 difference statistic, the other goodness-of-fit indices for the three models were shown in Table 28.

Table 28

Goodness-of-fit Indices for Models without and with Error-covariances

| Model | <i>df</i> | χ^2 | $\Delta\chi^2$ | Δdf | Normed χ^2 | RMSEA | CFI | NNFI |
|--------------------------------|-----------|----------|--------------------------|-------------|-----------------|---------------------|-----|------|
| M1 with 0 error-covariances | 48 | 213.89 | - | - | 4.46 | .140 (.130-.120) | .83 | .76 |
| M2 with 3 error-covariances | 45 | 114.41 | 99.48, <i>p</i> < .05 | 3 | 2.54 | .095 (.074-.120) | .96 | .89 |
| M3 with 4 error-covariances | 44 | 97.65 | 16.76, <i>p</i> < .05 | 1 | 2.22 | .084 (.063-.110) | .94 | .92 |

Note. N=185.

Besides χ^2 difference statistic, Model 3 with 4 subscale-based error-covariances appears to reach an acceptable fit. Model 3 produces the fit indices as follows: ($\chi^2(44) = 97.65, p < .05$, normed $\chi^2=2.22$, RMSEA=.084 (.063-.110), CFI=.94, NNFI= .92). Model 3 demonstrates that the RMSEA value of .084 approaches the .08 cutoff value, the CFI and NNFI indices were above the .90 desired value, and the normed χ^2 was within the less-than-3 desired range.

Apart from the goodness-of-fit indices, the choice of Model 3 with 4 subscale-based error-covariances could be justified by three reasons. First, two subscale-based error-covariances were drawn on the subscales of Interest Value and Cost, and Cost and Ability Self-concept in the latent variable of identity-based writing motivation. These error-covariances revealed one additional latent variable not captured by the original model (Model 1). This additional latent variable might be attributed to self-oriented reasons for writing English research articles expressed across the 3 subscales. For example, the Interest Value subscale had an item of “I find English research-article writing very interesting.” The Cost subscale had an item of “I have to give up a lot to do well in writing research-articles in English.” The Ability

self-concept subscale has an item of “I am good at writing English research-articles.” These self-oriented reasons might account for error-covariances between the subscales of Interest Value and Cost, and between the subscales of Cost and Ability Self-concept in identity-based writing motivation.

Second, one subscale-based error-covariances was drawn on the subscales of Utility Value and Connectedness Value in the latent variable of identity-based writing motivation. The error-covariance revealed another additional latent variable not captured by the original model (Model 1). This additional latent variable might be attributed to society-oriented reasons to write research articles expressed in the 2 subscales. For example, the Utility Value subscale had an item of “Being good at writing research articles in English will be important when I look for a job or pursue further studies.” The Connectedness Value subscale has an item of “Being good at writing English research-articles is important to me because it will allow me to gain a social prestige in my disciplinary community.” These society-oriented reasons might account for an error-covariance between the subscales of Utility Value and Connectedness Value in identity-based writing motivation.

Third, one subscale-based error-covariance was drawn on the subscales of Cognition Regulation and Motivation Regulation in the latent variable of self-regulatory writing strategy. The error-covariance reveals an additional latent variable not captured by the original model (Model 1). Specifically, the covariance between the two subscales of Cognition Regulation and Motivation Regulation was negative, indicating that if the participants increased some of motivation regulation strategies they tended to decrease some of cognition regulation strategies (i.e., efforts that participants make by regulating cognition for RA-abstract writing). A possible speculation for this negative covariance was that: once the participants used more motivation regulation strategies they might have less time and energy left for

cognition regulation strategies and vice versa. In other words, use of motivation regulation strategy and cognition regulation strategies might both take cognitive capacity that was usually not unlimited from an individual perspective. Presumably, individuals had a quota limit of cognitive capacity for use of regulation strategies. Once the participants' use of either type of the regulation strategies (i.e., cognition regulation and motivation regulation) increased, their use of the other type would probably be compromised. However, this explanation is speculative in nature. It remains largely unknown whether the participants' use of motivation regulation strategy helps or hinders their use of cognition regulation strategy, thus needing further research.

In sum, even though these 3 newly-identified latent variables might be of lesser importance to the present study, they were reported to explain more variance in the data.

Taken together, Model 3 indicates that the hypothesized factor structure was a good approximation to the data collected in the formal study. The four latent variables, L2 literacy, identity-based writing motivation, self-regulatory writing strategies, and RA-abstract writing ability can be measured by the 12 indicators. That is, L2 literacy can be measured by subscales of Reading and Writing. Identity-based writing motivation can be measured by subscales of Interest Value, Utility Value, Cost, Connectedness Value, and Ability Self-concept. Self-regulatory writing strategies can be measured by subscales of Cognition Regulation, Motivation Regulation, and Socio-interactive Resources Regulation. RA-abstract writing ability can be measured by subscales of Global Move and Local Pattern.

Correlations Between the Latent Variables

Table 29 reports correlations between the 4 latent variables in the study. Small

correlations occurred between identity-based writing motivation and L2 literacy ($r=.13, p <.05$), and between identity-based writing motivation and RA-abstract writing ability ($r=.24, p <.05$). Medium correlation occurred between identity-based writing motivation and self-regulatory writing strategy ($r=.46, p <.05$). Large correlation occurred between L2 literacy and RA-abstract writing ability ($r=.55, p <.05$). Negligible correlations occurred between self-regulatory writing strategy and L2 literacy ($r=-.05$), and between writing strategy and RA-abstract writing ability ($r=.02$). Statistically, the sample of the L2 graduate students in the study did not support the hypothesis that self-regulatory writing strategy correlates with RA-abstract writing ability. However, the sample supported that self-regulatory writing strategy correlated with identity-based writing motivation, and identity-based writing motivation correlated with RA-abstract writing abilities. Meanwhile, identity-based writing motivation correlated with L2 literacy that functioned as a covariate with lesser research interest of the study. L2 literacy also correlated with RA-abstract writing ability.

Overall, the results confirm expectations for correlations among L2 literacy, identity-based writing motivation, and abstract-writing ability, and correlation between identity-based writing motivation and self-regulatory writing strategies. However, the negligible correlation between self-regulatory writing strategy and abstract-writing ability is beyond expectation.

Table 29

Correlations Between the 4 Latent Variables

| Latent variables | 1 | 2 | 3 |
|---------------------------------------|------|------|-----|
| 1. L2 literacy | - | | |
| 2. Identity-based writing motivation | .13* | - | |
| 3. Self-regulatory writing strategies | -.05 | .46* | - |
| 4. RA-abstract writing ability | .55* | .24* | .02 |

Note. * $p <.05$.

Construct Validity Testing

To test construct validity of the 4 measures used in the study, evidence for convergent validity and discriminant validity was collected. Construct validity is of great importance to ensure that a set of indicators adequately reflect the theoretical latent construct (latent variable) these indicators were designed to measure (Hair et al., 2010). Moreover, construct validity is an umbrella term that subsumes all aspects of validity, such as content validity, criterion-related validity, convergent validity, and discriminant validity (Kline, 2011). When examining the construct validity of structural equation model, it is conventional to examine convergent validity and discriminant validity (Hair et al., 2010, Kline, 2011). Kline (2011) states that convergent validity and discriminant validity evaluate measures against each other, rather than against an external criterion. A set of indicators designed to measure the same construct show convergent validity if they inter-correlated in at least a moderate size (Kline, 2011). On the other hand, a set of indicators designed to measure different constructs shows discriminant validity if they do not inter-correlate in a large size (i.e., $r=.90$ may not support discriminant validity) (Kline, 2011). In fact, convergent validity is often evaluated by factor loadings on CFA (Hair, et al., 2010), by composite reliability, and by average variance extracted estimate (AVE) for the measures used (Farrell, 2010; Hair et al., 2010; Tabachnick & Fidell, 2007). Discriminant validity is evaluated by comparing AVE estimates with the square of the correlation between the theoretical latent variables (Fornell & Larcker, 1981). The following will first report convergent validity, and then discriminant validity.

Convergent Validity

Factor loadings. Figure 3 shows the value that each indicator loads on the designated latent variable in the completely standardized solution (also see the un-standardized solution in Appendix K).

For the latent variable of self-regulatory writing strategies, factor loadings are as follows: .66 for cognition regulation, .77 for motivation regulation, and .75 for socio-interactive resources regulation. For the latent variable of RA-abstract writing ability, factor loadings are .77 for global move, and .82 for local pattern. On these two latent variables, all factor loadings of the five indicators reached statistical significance. Meanwhile, the factor loadings were all higher than .60, indicating that these indicators show good convergent validity on the two latent variables, self-regulatory writing strategies and RA-abstract writing ability.

For latent variable of L2 literacy, factor loadings are .55 for reading and .89 for writing. For latent variable of identity-based writing motivation, factor loadings are as follows .83 for interest value, .61 for utility value, .13 for cost, .56 for connectedness value, and .77 for ability self-concept. On these two latent variables, most factor loadings (6 out of 7) reached statistical significance, and demonstrate a value of higher than or close to .60 that was the cutoff value for factor loading (Hair et al., 2010). However, the factor loading of cost indicator was .13, lower than the .60 cutoff, and at a non-significant level. Instead of deleting this indicator, it was kept for two reasons. First, cost served as an essential indicator of motivation in the expectancy-value theory that Eccles and her colleagues propose (Eccles, 2009; Eccles et al., 1983; Eccles & Wigfield, 2002). Besides the theoretical foundation, cost indicator was also endorsed by quite a few doctoral students in the formal study who had sufficient experiences in writing RA-abstracts. With the theoretical and practical reasons, cost indicator was retained.

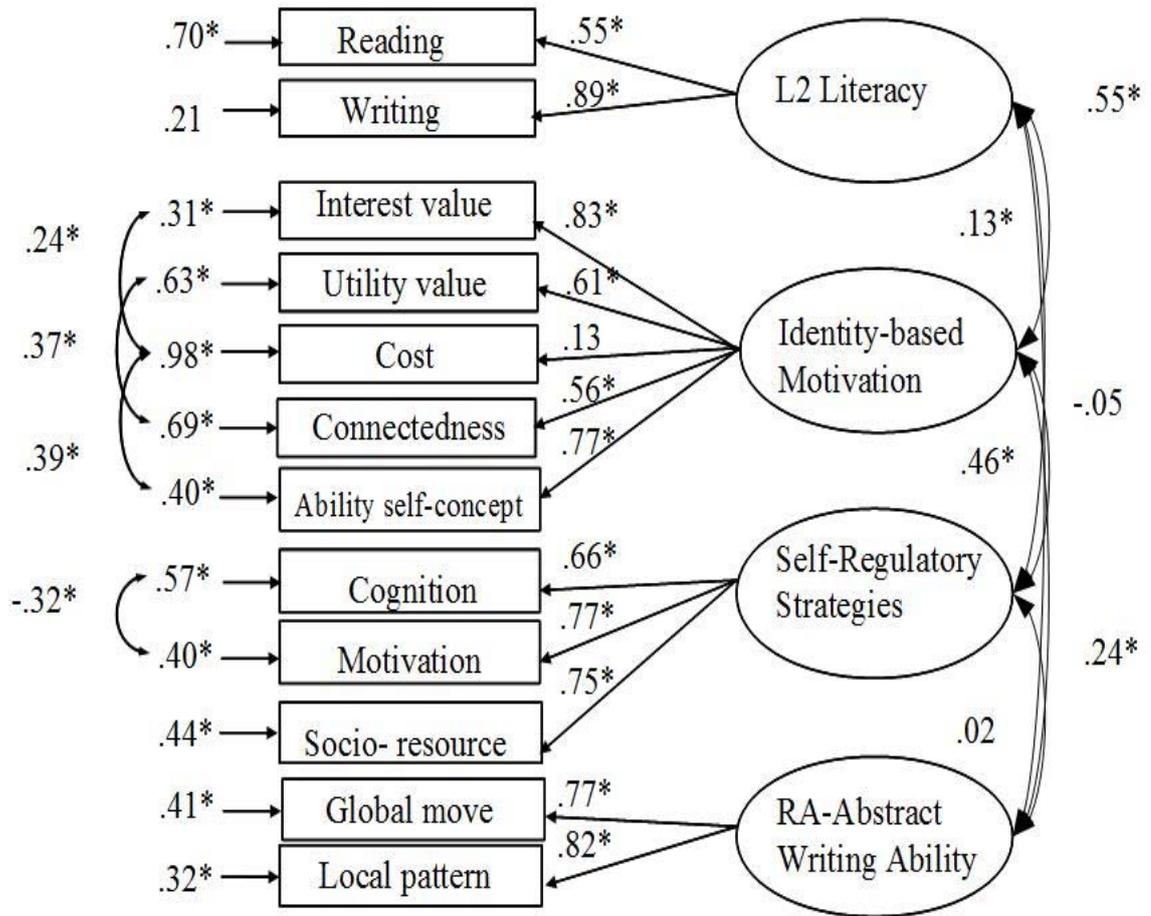


Figure 3. The measurement model of the MAW model in the completely standardized solution

Figure 3 also displays error variances of the 12 indicators. First, error variances of the 2 indicators for L2 literacy are .70 for reading and .21 for writing. Second, error variances of the 5 indicators for identity-based writing motivation are shown below: .31 for interest value, .63 for utility value, .98 for cost, .69 for connectedness value, .40 for ability self-concept. Additionally, 3 error-covariances among indicators were: .24 between interest value and cost; .39 between cost and ability self-concept; .37 between utility value and connectedness value.

Third, error variances of the 3 indicators for self-regulatory writing strategies are .57 for cognition regulation, .40 for motivation regulation, and .44 for

socio-interactive resources regulation. Additionally, an additional error co-variance was $-.32$ between cognition regulation and motivation regulation. Fourth, error variances of the 2 indicators for RA-abstract writing ability are $.41$ for global move, and $.32$ for local pattern.

Out of the 12 error-variances, 5 error-variances of the indicators exceeded the $.50$ cutoff (Hair, et al., 2010). These 5 corresponding indicators are reading for L2 literacy; utility value, cost, and connectedness value for identity-based writing motivation; and cognition regulation for self-regulatory writing strategy. Statistically, the 5 indicators explained less than half of the variance in their theoretical latent variables. Meanwhile, the other 7 error-variances of the indicators did not exceed the level of $.50$. These 7 corresponding indicators are writing for L2 literacy; interest value and ability self-concept for identity-based writing motivation; motivation regulation and socio-interactive resources regulation for self-regulatory writing strategy; global move and local pattern for RA-abstract writing ability. Statistically, these 7 indicators explained more than half of the variance in their corresponding latent variables. Except for the indicator of cost, the above statistics provide acceptable, though not abundant, evidence for the convergent validity for the motivated abstract-writing model (the MAW model).

Composite reliability. In addition to factor loadings, convergent validity in the study was evaluated by composite reliability of each latent variable (Hair et al., 1998, 2010; Tabachnick & Fidell, 2007). Composite reliability represents the internal consistency of the items of a latent variable (Hair et al., 1998, 2010). Composite reliability values of the 4 measures for the theoretical latent constructs were shown below: $.69$ for L2 literacy, $.74$ for identity-based writing motivation, $.77$ for self-regulatory writing strategies, and $.78$ for RA-abstract writing ability. The 4 composite reliability values were all higher or close to the $.70$ cutoff, suggesting good reliability in

terms of internal consistency (Bagozzi & Yi, 1998; Hair et al., 2010). That is, the four measures all reliably represent the theoretical latent variable (Hair et al., 2010).

Average Variance Extracted Estimate (AVE). Average variance extracted (AVE) estimate was also used to evaluate convergent validity. AVE estimate reflects the degree to which a latent variable can explain variance in the indicators to which it is connected theoretically (Farrell, 2010; Hair et al., 2010). It is a “summary indicator of convergence” (Hair et al., 2010, p.709), and computed as the sum of all squared standardized factor loadings divided by the number of indicators (Hair et al., 2010).

In the study, the AVE estimates of the four latent variables were: .55 for L2 literacy, .40 for identity-based writing motivation, .53 for self-regulatory writing strategies, and .63 for RA-abstract writing ability. Except for that of identity-based writing motivation, the other three were higher than the .50 desired value (Fornell & Larcker, 1981; Hair et al., 2010), indicating these three latent variables explain more than half of the variance in the indicators, with the rest being their error variances (Hair et al., 2010).

On the basis of factor loadings, composite reliability, and AVE estimates, it can be tentatively concluded that the measures for the MAW model show sufficient reliability. This sufficient reliability thus provides evidence for convergent validity of the MAW model.

Discriminant Validity

Discriminant validity refers to the degree to which a latent variable is actually independent of other latent variables (Hair, et al., 2010). High discriminant validity suggests that a latent variable has independent properties in presenting some phenomena that other latent variables do not. Evidence for discriminant validity can be collected by a test that compares the AVE estimates for any two latent variables

with the square of the correlations between these two latent variables (Farrell, 2010; Fornell & Larcker, 1981; Hair et al., 2010). The AVE estimate should be greater than the squared correlations. The logic is that “a latent construct [variable] should explain more of variance in its item measures than [than] it shares with another construct” (Hair et al., 2010, p.710). The greater AVE estimates provide good evidence for discriminant validity.

To perform the test on discriminant validity, the AVE estimates of the four latent variables were compared with the square of the correlations between the latent variables. Table 30 shows the AVE estimates and the square of the correlations between the two latent variables. The AVE estimates were shown as: .550 for L2 literacy, .400 for identity-based writing motivation, .530 for self-regulatory writing strategies, and .630 for RA-abstract writing ability. The squared correlations ranged from .000 to .303. Next, comparisons between the squared correlations and the AVE estimate of each latent variable were made. Take the highest squared correlation (i.e., between L2 literacy and RA-abstract writing ability) for example. The squared correlation was .303, which was lower than the two AVE values, .550 for L2 literacy, and .630 for RA-abstract writing ability, suggesting discriminant validity holds between L2 literacy and RA-abstract writing ability.

In addition, the other squared correlations were all lower than the two corresponding AVE values. This result indicates that the overlapping variance between two latent variables was smaller than the variance that one latent variable can explain, suggesting each latent variable has sufficient independent properties. These independent properties thus provide evidence for discriminant validity of the MAW model in question (Farrell, 2010; Fornell & Larcker, 1981; Hair et al., 2010).

Table 30

The AVE and the Square of the Correlations Between the Latent Variables

| Latent variables | 1 | 2 | 3 | 4 |
|---------------------------------------|-------------|-------------|-------------|-------------|
| 1. L2 literacy | .550 | .016 | .002 | .303 |
| 2. Identity-based writing motivation | .130 | .400 | .212 | .006 |
| 3. Self-regulatory writing strategies | -.050 | .460 | .530 | .000 |
| 4. RA-abstract writing ability | .550 | .240 | .002 | .630 |

Note. AVE values are presented on the diagonal. Correlations are below the diagonal; squared correlations are above the diagonal.

In sum, evidence for convergent validity and discriminant validity suggest that the 12 indicators were operationalized as well-designed measures for the 4 latent variables proposed in the study. This measurement model serves as a basis for testing the structural model below.

The Structural Model

Against the backdrop of the measurement model, the structural model was estimated by a maximum-likelihood analysis using LISREL 8.8 (see Figure 4). Similar to the measurement model, the structural model was evaluated by chi-square value and Hair et al.'s (2010) proposed cutoffs for 4 fit-indices, including normed χ^2 (a range from 1 to 3); root-mean-square error of approximation (RMSEA, less than .08), comparative fit index (CFI, greater than or equal to .90 on the 0-1.0 scale), and non-normed fit index (NNFI, also known as TLI, close to 1 on the 0-1.0 scale).

Goodness of Fit Indices

The structural model shows an acceptable fit to the data collected in the formal study, according to the fit indices shown in Table 31 ($\chi^2(45)= 99.16$, $p < .05$, normed $\chi^2=2.20$, RMSEA=.085, CFI=.94, NNFI= .92). In fact, the normed χ^2 , CFI, and NNFI were at the desired values, while the RMSEA slightly exceeded the .08 cutoff.

However, it is not uncommon that acceptable models has RMSEA values larger than .08 (often ranging from .80 to .10), particularly for a sample size of less than 200 (Bagozzi & Yi, 1988). Given the sample size of the study (n=185), the slightly higher value of RMSEA was considered acceptable. Accordingly, the results indicate that the hypothesized structural model was a good approximation to the data collected in the formal study.

Table 31

Fit Indices of the Structural Model

| Indices | χ^2 | df | Normed χ^2 | RMSEA | CFI | NNFI |
|---------|----------|----|-----------------|-------|-----|------|
| | 99.16 | 45 | 2.20 | .085 | .94 | .92 |

Factor Loadings of the Structural Model

Figure 4 shows the structural model of the MAW model in the completely standardized solution, including factor loadings and error-variances (also see the un-standardized solution in Appendix L).

First, for the latent variable of self-regulatory writing strategies, factor loadings are .68 for cognition regulation, .77 for motivation regulation, and .74 for socio-interactive resources regulation. Second, for the latent variable of RA-abstract writing ability, factor loadings are .77 for global move and .82 for local pattern. All factor loadings of the five indicators reached statistical significance. Also, the factor

loadings were all higher than the .60 cutoff. Third, for latent variables of L2 literacy, factor loadings are as follows: .55 for reading and .89 for writing. Fourth, for latent variables of identity-based writing motivation, factor loadings are as follows: .83 for interest value, .60 for utility value, .12 for cost, .55 for connectedness value, and .77 for ability self-concept. Most factor loadings (6 out of 7) reached statistical significance, and demonstrated a value of higher than or close to the .60 cutoff (Hair et al., 2010). However, the factor loading of the variable cost was .12 at the non-significant level, a value lower than the cutoff.

Besides factor loadings, error variances of the 3 indicators for self-regulatory writing strategies are shown at first: .54 for cognition regulation, .40 for motivation regulation, .46 for socio-interactive resources regulation. Additionally, an error co-variance was -.34 between cognition regulation and motivation regulation. Second, error variances of the 2 indicators for RA-abstract writing ability are .41 for global move and .32 for local pattern. Third, error variances of the indicators for L2 literacy are .70 for reading and .21 for writing. Fourth error variances of the 5 indicators for identity-based writing motivation are as follows: .31 for interest value, .64 for utility value, .99 for cost, .69 for connectedness value, and .40 for ability self-concept. Additionally, the error-covariance values were: .25 between interest value and cost; .40 between cost and ability self-concept; .37 between utility value and connectedness value.

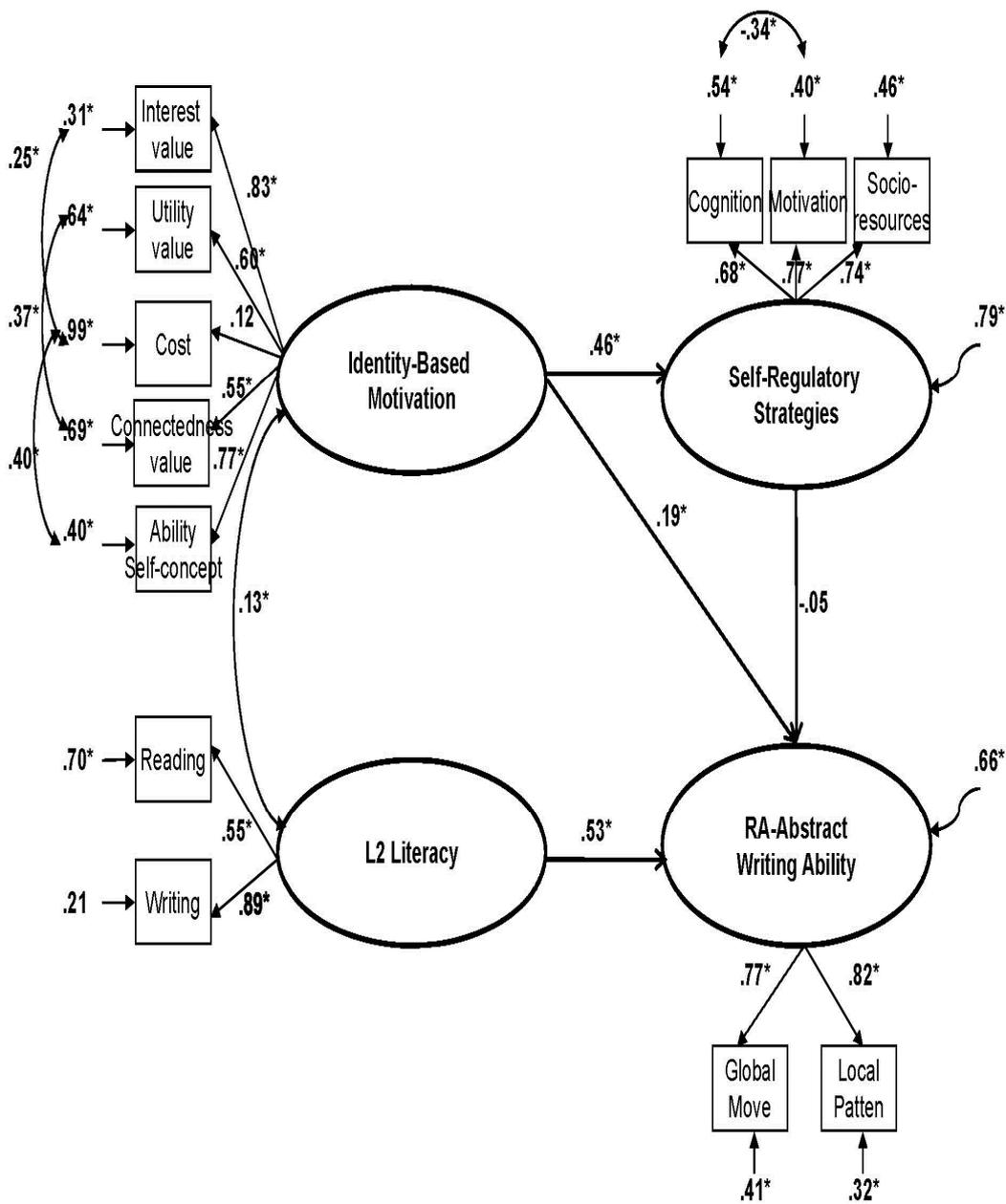


Figure 4. The structural model of the MAW model in the completely standardized solution

Out of the 12 error-variances, 5 error-variances of the indicators exceeded the .50 cutoff (i.e., error variance should be lower than .50) (Hair, et al., 2010). These 5 corresponding indicators are reading for L2 literacy; utility value, cost, and connectedness value for identity-based writing motivation; and cognition regulation

for self-regulatory writing strategy. Statistically, the 5 indicators explained less than half of the variance in their theoretical latent variables. Meanwhile, the other 7 error-variances of the indicators did not exceed the level of .50. These 7 corresponding indicators are writing for L2 literacy; interest value and ability self-concept for identity-based writing motivation; motivation regulation and socio-interactive resources regulation for self-regulatory writing strategy; global move and local pattern for RA-abstract writing ability. Statistically, these 7 indicators explained more than half of the variance in their corresponding latent variables.

Overall, the standardized factor-loading estimates are similar to the CFA results in step 1. Five loading estimates change slightly. The maximum change is .02 on the estimates of cognition regulation (from .66 in the measurement model to .68 in the structural model). The other four changes are .01 on the estimates of utility value, cost, connectedness value, and socio-interactive resources regulation. This similarity in the loading estimates supports stability among the measured indicators. That is, “no problem is evident due to interpretational confounding and further supports the measurement model’s validity” (Hair et al., 2010 p. 744).

Regression Coefficients of the Structural Model: Hypotheses Testing

In addition to factor loadings in the standardized solution, Figure 4 also shows regression coefficients of the structural model. The structural model responds to the research question (shown in Chapter 1). In particular, this research question was transformed into three corresponding hypotheses, as described below:

Hypothesis 1: While controlling for L2 literacy and use of self-regulatory writing strategies, L2 graduate students’ identity-based writing motivation has a direct effect on their English research-article (RA) abstract writing ability.

Hypothesis 2: While controlling for L2 literacy and identity-based writing motivation, L2 graduate students' use of self-regulatory writing strategies has a direct effect on their English RA-abstract writing ability.

Hypothesis 3: L2 graduate students' identity-based writing motivation has an indirect effect on their English RA-abstract writing ability via their use of self-regulatory writing strategies.

In response to these three hypotheses, a series of effects on RA-abstract writing ability were reported. As expected, L2 literacy showed a direct effect on RA-abstract writing ability of L2 graduate students ($\beta=.53, p < .05$). Although this direct effect of L2 literacy was of less interest for the present study, it was confirmed by the study as a major source of variance in RA-abstract writing ability. In this sense, L2 literacy was treated as a covariate whose direct effect was statistically controlled, so that a test purely focusing on motivation effect or self-regulatory strategy effect was enabled. With L2 literacy as a covariate, the three hypotheses were tested in sequence. Hypothesis 1 was supported, as expected. Identity-based writing motivation had a direct effect on RA-abstract writing ability ($\beta=.19, p < .05$). Unexpectedly, Hypothesis 2 was not supported. The use of self-regulatory writing strategies had no direct effect on RA-abstract writing ability ($\beta=-.05, p > .05$). Hypothesis 3 was not supported, either. Identity-based writing motivation had no indirect effect on RA-abstract writing ability via the use of self-regulatory writing strategies ($\beta=-.02, p > .05$). On the whole, 34 % of the variance in RA-abstract writing ability could be explained by its predictor variables.

In addition to the three hypotheses in question, identity-based writing motivation showed a direct effect on the use of self-regulatory writing strategies ($\beta=.46, p < .05$). In fact, 21% of the variance in self-regulatory writing strategy can be explained by its

predictor variable, identity-based writing motivation.

Some noteworthy results of the study were that contrary to expectations, the use of self-regulatory writing strategies had no direct effect on RA-abstract writing ability of L2 graduate students. Also, identity-based writing motivation had no indirect effect on RA-abstract writing ability via the use of self-regulatory writing strategies.

CHAPTER FIVE DISCUSSION AND CONCLUSION

The chapter first presents an overview of the study, followed by discussion of the findings on the measures and the proposed hypotheses with regard to prior research. Then, the chapter discusses implications for pedagogy and theory, followed by conclusions.

Overview of the Study

The aim of the study was to test the veracity of a model hypothesizing research-article (RA) abstract writing ability to be the outcome of a motivated learning process in which identity-based writing motivation interacts with use of self-regulatory writing strategies and a covariate of L2 literacy. To test this model, the study collected data from 185 participants of L2 graduate students majoring in applied linguistics (i.e., master's and doctoral students) who were recruited on a voluntary basis across 15 universities in Taiwan. The participants underwent a 130-minute procedure involving four measures in sequence, L2 literacy test (55 minutes), RA-abstract writing task (60 minutes), and surveys on identity-based writing motivation and self-regulatory writing strategy use (15 minutes). L2 literacy test and RA-abstract writing task were given in a counter-balanced order: half of the participants took the test and then the writing, the other doing the opposite.

In particular, the model was termed as the motivated abstract-writing model (the MAW model), and tested by the 2-step approach of the structural equation modeling. First, the measures in the study were tested in a measurement model to ensure their psychometric properties. Second, against the backdrop of the measurement model, a structural model of the MAW model was constructed and evaluated. Evaluation on the MAW model was completed by the findings on three major hypotheses, as shown below.

Hypothesis 1 (supported): While controlling for L2 literacy and use of self-regulatory writing strategies, L2 graduate students' identity-based writing motivation has a direct effect on their English research-article (RA) abstract writing ability.

Hypothesis 2(unsupported): While controlling for L2 literacy and identity-based writing motivation, L2 graduate students' use of self-regulatory writing strategies has a direct effect on their English RA-abstract writing ability.

Hypothesis 3 (unsupported): L2 graduate students' identity-based writing motivation has an indirect effect on their English RA-abstract writing ability via their use of self-regulatory writing strategies.

These findings are briefed in Figure 5.

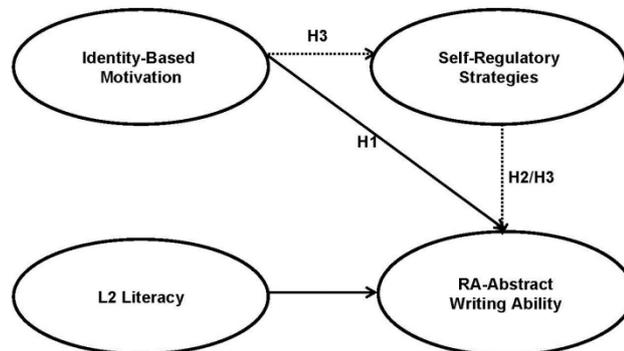


Figure 5. The findings on the Motivated Abstract-Writing model. Solid lines indicate the support for the hypotheses, while the dotted lines indicate the non-support for the hypotheses.

Discussion

On the basis of the findings on the MAW model, the following discussion will proceed in an attempt at aligning these findings with the previous studies on the similar issues in question. First, the discussion will address the measures used here in relation to the previous studies, although they were treated as a prerequisite rather than a pivotal concern in the proposed hypotheses. A brief discussion on the measures may provide more background information on how the MAW model is constructed and evaluated. Second, the discussion will address the findings on the MAW model, focusing on the three hypotheses in relation to the previous studies respectively.

The Measures Developed in the Study

As reported in Chapter Four, analyses on reliability, CFA, and construct validity initially substantiate the psychometric quality of the 4 measures designed for the 4 factors. The four measures included GEPT-advanced for L2 literacy, identity-based writing motivation inventory (IWMI) for identity-based writing motivation, self-regulatory writing strategy inventory (SWSI) for self-regulatory writing strategies, and research-article abstract performance assessment (RAPA) for RA-abstract writing ability. These findings reveal that an acceptable-fitting 4-factor model holds in line with the proposed theoretical construction (i.e., the motivated abstract-writing model, the MAW model). Besides the overall acceptable-fit of the MAW model, these measures are worthy of note; particularly for the three measures developed for the current study, including IWMI, SWSI, and RAPA.

Identity-based Writing Motivation Inventory (IWMI). The preliminary validity evidence on IWMI suggests the latent variable of identity-based writing motivation can be manifested and measured by five subscales: interest value, utility value, cost, connectedness value, and ability self-concept. Specifically, these five subscales were adopted to operationalize the definition of identity-based writing motivation in the present study, “an identity-development process in which L2 graduate students seek to develop an identity of non-native-English-speaking (NNES) researchers by learning to write RAs acceptable to their disciplinary communities,” as stated in the Introduction chapter. By these five subscales, IWMI shows a feasibility to contextualize the latent variable of identity-based writing motivation into learning of RA-abstract writing. In particular, it is feasible to synthesize the identity-based motivation (Oyserman et al., 2002, Oyserman & Destine, 2010) and the expectancy-value theory in educational psychology (Eccles et al, 1983; Eccles, 2009), with the socio-educational theory (Gardner, 1985, 2007) and the genre theory (Swales, 1990) in L2 learning when describing L2 graduate students’ motivation for RA writing in Taiwan.

Aside from this overall evidence, it is noteworthy that a few error-covariances were drawn between subscales of IWMI, including the subscales of Interest Value and Cost, the subscales of Cost and Ability Self-concept, and the subscales of Utility Value and Connectedness Value. First, the Cost subscale significantly correlated with the subscales of Interest Value and Ability Self-concept in error terms. As stated in the Results chapter, this correlation may be attributed to how item measures were phrased: Interest Value (e.g., “I find English research-article writing very interesting), Cost (e.g., I have to give up a lot to do well in writing research-articles in English), and Ability Self-concept (I am good at writing English research-articles). These item measures all involved self-oriented reasons individuals perceived for RA writing in

English. Moreover, these self-oriented reasons may be partially related to (a) how actively individuals pursue “personal identity” through a particular task that individuals feel more efficacious in achieving the task, and (b) what subsequent choices individuals will take in a pursuit or denial of this personal identity (Eccles, 2009). However, the findings on an error-covariance between Interest Value and Cost, and that between Cost and Ability Self-concept appear flimsy. Clearly, the finding does not allow an extensive interpretation on how Interest Value, Cost, and Ability Self-concept closely relate to individuals’ pursuit or denial of a personal identity, thus calling for further investigations.

In addition, the Cost subscale was found the least reliable measure as reflected in its low R-squared value and factor loading value. This result however was not surprising, and actually consistent with Conley’s (2007) statement on the absence of cost in many studies of subjective task value (p. 87). Although Conley did not elaborate on the reasons why these previous studies exclude cost when testing motivation structure by the expectancy-value theory, it can be speculated that cost did not perform as well as the other subscales regarding psychometric properties.

Theoretically, cost has been identified as a measurable subscale of motivation (Eccles et al., 1983). Empirically, this study found that when addressing L2 graduate students’ motivation for English RA writing, cost appeared elusive in mensurability, as compared to other subscales (i.e., interest value, utility value, attainment value, and ability self-concept) in the expectancy-value theory. Given this finding, it is understandable that previous studies exclude cost from scale of subjective task (Conley, 2007). If cost is indeed an indispensable element of motivation in theoretical terms, its psychometric properties will require further investigations, such as improving its mensurability with better item measures. Accordingly, cost may also become meaningful in practical terms.

Second, the Connectedness Value subscale significantly correlated with the Utility Value subscales in error terms. This significant correlation might have been related to how connectedness value was conceptualized here. In the study, connectedness value is a new construct proposed to reflect context-specific motivation of L2 graduate students. Inspired by the construct of integrativeness (Gardner, 1985, 2007), connectedness value refers to L2 graduate students' subjective appraisals of reasons and benefits for socializing into a chosen disciplinary community by writing RAs acceptable to the community. Connectedness value also substitutes for attainment value in the expectancy-value theory. As a context-specific type of attainment value, connectedness value represents a specific value for L2 attainment that encompasses gaining a social identity. According to this definition, connectedness value refers to society-oriented reasons and benefits that individuals appraise for RA writing in English (“Being good at writing English research-articles is important to me because it will allow me to gain a social prestige in my disciplinary community.”)

Likewise, utility value also involves such society-oriented reasons and benefits (e.g., “Being good at writing research-articles is important when I look for a job or pursue further studies.”). It is rather likely that these society-oriented reasons may account for error-covariance in Utility Value and Connectedness Value, as stated in the Results chapter. Moreover, these society-oriented reasons (manifested by utility value and connectedness value) may be partially related to (a) how actively individuals pursue “collective identity” through a particular task that individuals feel more efficacious in achieving the task, and (b) what subsequent choices individuals will take in a pursuit or denial of this collective identity (Eccles, 2009). However, the finding on the error-covariance between Utility Value and Connectedness Value appears tentative. Clearly, the finding does not allow an extensive interpretation on how closely utility value and connectedness value relate to individuals' pursuit or

denial of a collective identity; further investigations are needed.

Self-regulatory Writing Strategy Inventory (SWSI). The preliminary validity evidence on SWSI suggests the latent variable of self-regulatory writing strategy can be manifested and measured by three subscales: Cognition Regulation, Motivation Regulation, and Socio-interactive Resources Regulation. Specifically, these three subscales were adopted to operationalize the definition of self-regulatory writing strategy in the present study, “perceived effort that individuals make to effectively regulate cognition, motivation, behavior, and context to better approach L2 writing,” as stated in the Introduction chapter. By these three subscales, SWSI shows a feasibility to contextualize the latent variable of self-regulatory strategy into learning of RA-abstract writing in L2. In particular, it is feasible to synthesize the self-regulated learning theory (Pintrich, 2004; Wolters et al., 2003), L2 writing theory, and RA-writing theory (Petrić & Czarł, 2003; Swales & Feak, 2009) when describing L2 graduate students’ use of self-regulatory strategy for RA-abstract writing in Taiwan.

Aside from this overall evidence for validity of SWSI, it is noteworthy that an error-covariance was drawn between subscales of Cognition Regulation and Motivation Regulation in SWSI. Specifically, the covariance between the two subscales was negative, indicating that if the participants increased some of motivation regulation strategies they tended to decrease some of cognition regulation strategies (i.e., efforts that participants make by regulating cognition for RA-abstract writing). As stated in the Results chapter, a possible explanation for this negative covariance was that once the participants used more motivation regulation strategies they might have less time and energy left for cognition regulation strategies. However, this speculation remains tentative. To date, questions remain regarding (a) what are real causes for the negative covariance and (b) what consequences the covariance will

bring to learning achievement. Apparently, these questions call for further research.

Despite those pending questions, the following discussion will proceed by highlighting Schwinger et al.'s (2012) study that operationalized Wolters et al.'s (2003) self-regulated learning theory and detailed the interrelations between motivation regulation and effort regulation strategies (i.e., the present study defined cognition regulation as perceived efforts learners make to effectively regulate cognition so as to write better). Particularly for motivation regulation strategies, Schwinger et al.'s (2012) operationalized eight sub-constructs, enhancement of situational interest, enhancement of personal significance, mastery self-talk, performance-approach self-talk, performance-avoidance self-talk, environmental control, self-consequating, and proximal goal setting. Likewise, the present study operationalized motivation regulation strategy by three sub-constructs, relevance enhancement, relative ability self-talk, and self-consequating, adopted from Wolters et al.'s (2003) proposal as well. Since the present study and Schwinger et al.'s (2012) both followed Wolters et al.'s proposal in operationalizing motivation regulation, a further comparison on the findings of the two studies seems justifiable.

Specifically, Schwinger et al. (2012) argued that students, who only resort to performance self-talk as motivation regulation strategy, are less effective in increasing their task engagement or achievement. In a similar thread of research, performance-avoidance self-talk has been found not or weakly correlated with engagement and achievement (Lenzner & Dickhause, 2009 cited in Schwinger et al., 2012). Schwinger et al. (2012, p. 8) speculate that performance-avoidance goals seem “a dubious form of motivation” that often relates to maladaptive outcomes, such as test anxiety (Elliot & McGregor, 1999), self-handicapping (Urdu, 2004), and low academic self-efficacy (Middleton & Midgley, 1997). Based on this conjecture, certain types of self-talk are less effective motivation regulation strategies that do not

always promote adaptive task engagement and achievement.

Similarly, the present study found a negative correlation in error terms between cognition regulation and motivation regulation. Notably, this negative correlation occurs in error terms, rather than in factor loadings, indicating the negative correlation is something additional and minor. Yet the negative correlation is apparently different from zero or low correlation between motivation regulation and effort regulation reported by Schwinger et al. (2012). Apparently, what makes the negative correlation here requires further research. In particular, future research should explore what types of motivation regulation strategies are more or less effective in producing adaptive cognitive engagement and achievement in learning.

Research Abstract Performance Assessment (RAPA). As shown in the findings on the MAW model, RAPA including a timed RA-abstract writing task and two rating scales serves as a valid and meaningful measure for RA-abstract writing ability of L2 graduate students. This finding shows that it is feasible to construct a timed abstract-writing task and its corresponding rating scales for research purposes. Specifically, the rating scales were made by translating traditional qualitative analysis on global rhetorical moves and local lexico-grammatical patterns (Swales & Feak, 2009; Hsieh & Liou, 2008; Pho, 2008) into a more quantitative measure consisting of the two corresponding scales of global move and local pattern.

The two rating scales by themselves may serve as assessment criteria in writing pedagogy. In fact, they can be useful for L2 graduate students and instructors because they embody relative clarity and explicitness of assessment (Jonsson & Svingby, 2007). Usually, a rating scale embodies such clarity and explicitness by elucidating what is important through the scoring criteria and descriptors (Jonsson & Svingby, 2007). Drawing upon scoring criteria and descriptors in the two rating scales, instructors are more likely to conduct “reflective practice” on the effectiveness of

their instruction (Beeth et al., 2001; Jonsson & Svingby, 2007). In the same way, students are more likely to conduct self-assessment on their writing ability (Jonsson & Svingby, 2007). Such self-assessment may be meaningful to L2 graduate students under investigation, since the scoring criteria and descriptors demonstrate relative “transparency” that may help students learn “why they are doing what they are doing” (Jonsson & Svingby, 2007, p. 139).

Given its pedagogical and assessment potential, it may be of benefit to implement RAPA similar to the one used in this study as a part of proficiency or diagnostic tests for RA writing ability in post-graduate programs. For example, proficiency tests can be administered throughout the post-graduate programs to assess research-article writing ability in general. A diagnostic test that is developed to reveal students’ strengths and weaknesses in writing ability, to offer detailed feedback that can guide students’ follow-up actions, and to target “specific” instead of general abilities (Knoch, 2010), can be administered at the onset or end of the instruction in post-graduate programs. These applications of RAPA may make possible a finer-grained assessment on the RA-abstract writing ability of L2 graduate students. Because the present findings on applicability of the two rating scales remain preliminary, further studies are required to cross-validate their applicability.

Findings on the Testing of Three Hypotheses

Hypothesis 1: Motivation has a direct effect on writing ability (supported).

As expected, this hypothesis is supported. Specifically, the results will be discussed by the effects of L2 literacy and the identity-based writing motivation, so the role of L2 literacy as a covariate may be better interpreted.

The effects of L2 literacy. Before discussing the motivation effect on RA-abstract writing ability, it is necessary to discuss L2 literacy effect on RA-abstract

writing ability. As expected, L2 literacy showed the strongest direct effect on RA-abstract writing ability ($\beta=.53$), as compared to identity-based writing motivation and self-regulatory writing strategy. This finding suggests that high L2 literacy of reading and writing abilities may help L2 graduate students improve their RA-abstract writing ability, including global rhetorical move and local lexico-grammatical pattern. This finding supports existing quantitative surveys on L2 writing ability (Lu, 2010; Sasaki & Hirose, 1996), and qualitative inquiries into RA-writing ability (Cheung, 2010a, 2010b; Curry & Lilis, 2004; Flowerdew, 2000; Haung, 2010; Okisamu, 2006). In addition to L2 writing, this result is also consistent with Liem et al.'s (2008) SEM analysis that reveals a direct effect of prior L2 achievement on later L2 achievement (i.e., L2 as English) from a sample of Year-9 students in Singapore ($\beta=.55$) ($n=1475$).

The effect of identity-based writing motivation. While controlling for L2 literacy and self-regulatory writing strategy effects, identity-based writing motivation showed a direct effect on RA-abstract writing ability ($\beta=.19$). This finding is generally consistent with Bruinsma's (2004) study that investigated how undergraduate freshmen's expectancy (procrastination), task values, and deep information processing predicted their total number of credits (1 credit is an estimated study load of 40 hours) in University of Groningen ($n=565$) in a 2-year project by SEM analysis. Specifically, Bruinsma adopted the framework of expectancy-value theory in operationalizing expectancy and task value. A few item measures were exemplified as follows: "I miss a real incentive to work." for expectancy/procrastination, and "My interest in my study is continuously growing." for values (Bruinsma, 2004, p 565). Apparently, these items developed based on the expectancy-value framework serve as a basis for comparing Bruinsma's (2004) finding with that of the present study.

In fact, while controlling for grade point average in high school ($\beta=.37$ on the total number of credits in Year 1, $\beta=.06$, on the total number of credits in Year 2),

Bruinsma found a few motivational effects, including the expectancy/procrastination effect in Year 1 on the total number of credits ($\beta=-.12$), the expectancy/procrastination effect in Year 2 on the total number of credits ($\beta=-.09$), the value effect in Year 2 on the total number of credits ($\beta=.06$). In Bruinsma's study, the motivational effects of expectancy and value were shown by coefficients ranging from $-.12$ to $.06$, which appear comparable to that of the present study combining the motivational effects of expectancy and value ($\beta=.19$). In path analysis, Kyttälä and Björn (2010) investigated the role of prior mathematics performance, outcome expectancies and values, and anxiety in predicting later mathematics performance of lower-secondary school students in Finland ($n=116$). Kyttälä and Björn (2010) found later mathematics performance can be directly predicted by prior performance ($\beta=.44$), outcome expectancy ($\beta=.19$), and outcome value ($\beta=.18$); prior performance had a direct effect on outcome expectancy ($\beta=.47$). Although all these studies identified direct motivational effects, they differed in how motivation was defined. The two previous studies defined motivation as two separate constructs of expectancy and value, while the present study defined the expectancy-value motivation as a unitary construct termed as identity-based writing motivation.

Specifically, the direct motivation effect found here suggests that a high level of identity-based writing motivation that includes interest value, utility value, cost, connectedness value, and ability self-concept may help L2 graduate students improve RA-abstract writing ability that includes global move and local pattern. The finding provides direct evidence that effect of identity-based writing motivation was observable from a discipline-specific task: to develop English research-article abstract writing ability. Moreover, this motivation effect empirically confirmed a hypothetical identity-development process in which L2 graduate students would presumably become motivated to learn RA-abstract writing if they are willing to and capable of

pursuing a future identity as a non-native English-speaking researcher (NNES-researcher identity) who can write RAs acceptable to their chosen fields. This finding may be important, because motivation effect has often been found ubiquitous in learning for general purposes, as shown in educational psychology research (Kyttälä & Björn, 2010; Oyserman et al., 2002; Oyserman & Destin, 2010; Pintrich & De Groot, 1990; Pokay & Blumenfeld, 1990) and in L2 learning research (Csizér & Dörnyei, 2005; Csizér & Kormos, 2009; Gardner, 1985; Liem et al., 2008). In an effort to answer Dörnyei's (2005) call for contextualizing L2 motivation effect, L2 motivation researchers have pinpointed L2 learning for specific purposes so as to reveal how context shapes this effect on L2 learning (Mori, 2002; Mori & Gobel 2006). However, it remains largely unknown whether motivation effect empirically holds in a rather specific learning task, such as learning to write research-article (RA)-abstract in English, through a lens of motivated L2 learning.

Similarly, how context shapes L2 graduate students' motivation to learn RA writing has been increasingly-investigated in genre research, mostly through qualitative inquiry (Chang & Kanno, 2010; Cheung, 2010a, 2010b; Huang, 2010). In this vein of qualitative research, motivation is often expressed as an identity-seeking process where L2 graduate students seek their future identities in a chosen disciplinary community by striving to write RAs acceptable to the community (Cheng, 2007; Flowerdew, 2000; Hsieh & Liou, 2008; Huang, 2010; Hyland, 2000, 2002; Swales, 1990). In particular, this motivation is found as a key determinant of L2 graduate students' RA writing ability (Cheng, 2007; Huang, 2010). Likewise, Chang and Kanno (2010) detail idiosyncratic change in L2 motivation to form a researcher identity in given fields, and how this motivational change improves RA-writing ability of L2 graduate students (Chang & Kanno, 2010; Flowerdew, 2000; Huang, 2010). Despite qualitative evidence, this motivation effect has yet to be supported

through quantitative inquiry. Such quantitative inquiry will reveal an overall picture of motivated L2 learning to write RAs, including how well L2 graduate students' motivation can explain their achievement in RA writing ability (e.g., RA-abstract writing ability in question here).

The present study thus attempted to fill the above-mentioned gaps empirically. In fact, this study demonstrates that the motivation effect holds on RA-abstract writing ability of L2 graduate students. This finding indicates that when describing motivated RA writing of L2 graduate students, the Eccles expectancy-value theory (Eccles et al., 1983; Eccles, 2009) is applicable. Note that this application entails two major specifications.

First, it specifies the motivated abstract-writing model (the MAW model) by synthesizing identity-based motivation theory (Oyserman et al., 2002; Oyserman & Destin, 2010), expectancy-value theory (Eccles et al., 1983; Eccles, 2009), and genre theory (Swales, 1990) via the identity-seeking process. That is, if L2 graduate students seek an identity of future researcher through writing RAs acceptable to their fields, they will engage in motivated RA writing. Moreover, the MAW model specifies motivation as that for RAs writing in general (i.e., termed as identity-based writing motivation), but the ability as that of RA-abstract writing in particular. This specification made it possible to hypothesize identity-based writing motivation as a predictor of RA-abstract writing ability, and assess RA-abstract writing ability in a timed writing task.

Second, the current application of Eccles' theory specifies attainment value in the expectancy-value theory as connectedness value that largely characterizes the identity-based writing motivation. Specifically, connectedness value represents reasons and benefits that L2 graduate students subjectively assign to socializing into a chosen disciplinary community by writing RAs acceptable to the community.

Meanwhile, connectedness value is actually a specific form of Gardner's conception of integrativeness, which refers to learners' willingness to acculturate into a target-language speaking community, and often determines whether L2 learners can achieve the ultimate level of L2 learning attainment (Gardner, 1985, 2007). This newly-proposed construct of connectedness value made it possible to synthesize the identity-based motivation theory (Oyserman et al., 2002; Oyserman & Destin, 2010), the expectancy-value theory (Eccles et al., 1983, Eccles, 2009), the socio-educational theory (Gardner, 1985, 2007), and the genre theory (Swales, 1990, 2004).

These two specifications appear to contribute to the observable motivation effect on RA-abstract writing ability. In this sense, this finding supports existing research on expectancy-value motivation theory (Eccles & Wigfield, 2002; Eccles et al., 1983; Eccles, 2009), identity-based motivation theory (Oyserman et al., 2002; Oyserman & Destin, 2010), socio-educational motivation theory of L2 learning (Gardner, 1985; 2007), and genre theory (Swales, 1990; Swales & Feak, 2004, 2009, 2010); and empirical evidence on motivated learning in general (Conley, 2007; Luttrell et al., 2010), motivated L2 learning in particular (Mori, 2002; Mori & Gobel, 2006; Tseng & Schmitt, 2008), and disciplinary practices in which L2 graduate students learn to write research articles acceptable to their chosen fields (Chang & Kanno, 2010; Cheng, 2007; Cheung, 2010b; Flowerdew, 2000; Hsieh & Liou, 2008; Huang, 2010).

Hypothesis 2: Strategy has a direct effect on writing ability (unsupported).

Unexpectedly, this hypothesis was not supported. This result suggests that frequent use of self-regulatory writing strategies including cognition regulation, motivation regulation, and socio-interactive resources regulation does not necessarily lead to improvements in the RA abstract writing including global move and local pattern. This finding does not support existing research on self-regulated learning theory (Pintrich, 2004; Wolters et al, 2003; Wolters 2011), the strategic self-regulation model

of language learning (Oxford, 2011), and empirical evidence on self-regulated learning of general subjects (Pintrich & De Groot, 1990; Miller, Greene, Montalvo, Ravindran, & Nichols, 1996), and self-regulated learning of L2 (Tseng & Schmitt, 2008; Yang & Plakans, 2012).

It should be noted that the latent variable of self-regulatory writing strategy was conceptualized according to Wolters, Pintrich, and Karabenick's theory (2003) of self-regulated learning. Targeting RA-abstract writing as the outcome, the study adopted Wolters et al.'s (2003) proposal of measuring self-regulatory strategy by three subscales, cognition regulation, motivation regulation, and behavior regulation, but re-labeled the behavior regulation subscale as socio-interactive resources regulation to highlight the social nature of L2 learning (Oxford, 2011). Despite this relabeling, the study operationalized the socio-interactive resources regulation by item measures similar to those in Wolters et al.'s (2003) framework, including the item measures of effort management, help-seeking, as well as time and environment control. This similarity in item measures provides a basis to compare the present finding with those of previous studies' on self-regulated learning (Pokay & Bluenfeld, 1990; Schwinger, Steinmayr, & Spinath, 2009; Swalander & Taube, 2007; Wolters, 1998, 1999; Wolters et al., 2003).

In fact, most previous studies adopted Pintrich's theory of self-regulated learning and documented strategy use being predictive of a given achievement (Miller et al., 1996; Wolters, 1998; Swalander & Taube, 2007). Similarly, this study adopted the same self-regulated learning theory, yet found a non-significant effect of the self-regulatory writing strategy. This discrepancy in effects of self-regulatory strategy may be partially attributed to the control over prior performance. While previous studies did not control prior performance (Miller et al., 1996; Pintrich & De Groot, 1990; Wolters, 1998; Swalander & Taube, 2007), the current study took a specific

control over prior performance that has been consistently found as a strong covariate in self-regulated learning (Jones, 2008; Liem, et al., 2008; Pokay & Bluenfeld, 1990). Specifically, the study operationalized prior performance as L2 literacy that consists of L2 reading and writing abilities and specified prior performance as a covariate when modeling the motivated RA-abstract writing. It was then found that L2 literacy was quite effective in explaining the variance in the RA-abstract writing in question ($\beta=.53$). The result confirmed L2 literacy as a strong covariate. Speculatively, this covariate effect of L2 literacy may partially account for the nonsignificant effect of the self-regulatory writing strategy in the study. This speculation will be further articulated by comparing the present study with previous research reporting significant or nonsignificant effects of self-regulatory strategy.

Significant effects of self-regulatory strategy. As stated earlier, when examining effects of self-regulated learning or effects of strategy use, prior performance or knowledge often serves as a strong covariate (Liem et al., 2008; Schwinger et al., 2009, 2012). In order to better interpret effects of self-regulated learning or effects of strategy use, it seems necessary to consider prior performance or knowledge (Schwinger, Steinmayr, & Spinath, 2009, 2012). In this vein of thinking, previous studies reporting significant effects of self-regulated learning will be discussed in terms of whether these studies took control over prior performance.

On the one hand, a few studies reported no control over prior performance, though these studies reported significant effects of self-regulated learning on achievement. First, Swalander and Taube (2007) adopted the framework of Pintrich's self-regulated learning. They operationalized the construct of goal-oriented strategies by five subscales: memorization, elaboration, control expectancy, instrumental motivation, and effort and persistence. In SEM analysis, they identified negative direct effects of the goal-oriented strategies on reading ability of 8th grade students in

Stockholm, both in a pilot model ($n=2362$, $\beta=-.26$) and in the cross-validation model ($n=1384$, $\beta=-.35$). Somewhat contradictory to common expectations, their study shows that frequent use of self-regulatory strategy led to a low achievement, without a control over prior performance.

Second, a few recent studies on L2 writing did not use Pintrich's framework of self-regulated learning, but adopted self-developed framework of L2 writing strategies. These studies reported positive effects of L2 writing strategies on L2 writing ability, without controlling for prior performance or knowledge, such as L2 proficiency. For instance, Yang and Plakans (2012) adopted SEM analysis and operationalized self-regulation strategy as monitoring and evaluating strategies, and discourse synthesis strategy as connecting, organizing, and selecting. Originally, they hypothesized that both self-regulation strategy and discourse synthesis strategy had a direct effect on L2 integrative writing ability ($n=161$). Yet, they found only discourse synthesis strategy had a direct effect ($\beta=.33$), while self-regulation strategy had a direct effect on discourse synthesis strategy use ($\beta=.77$), and an indirect effect on integrative writing via discourse synthesis strategy ($\beta=.25$). On the whole, 10 % of the variance in L2 integrative writing ability could be explained by its predictor variables. In a similar SEM analysis, Yang (2012) examined the effects of test strategy use on L2 graph writing by operationalizing graph comprehension of global processing and local processing, graph interpretation of selecting and linking, and graph translation of planning and evaluating ($n=315$). Yang (2012) found a direct effect of graph translation on L2 graph writing ($\beta=.26$), an indirect effect of graph interpretation on writing via translation ($\beta=.24$), and an indirect effect of graph comprehension on writing via interpretation and translation ($\beta=.21$). On the whole, 7 % of the variance in L2 graph writing ability could be explained by its predictor variables.

Although Yang and Plakans (2012) and Yang (2012) identified the writing strategy in tests (i.e., connecting, organizing, and selecting in Yang and Plakans (2012); planning and evaluating in Yang (2012)) as a predictor of L2 writing ability and as a mediator between L2 writing ability and additional cognitive strategy variables (e.g., monitoring and evaluating; selecting and linking), their findings appear less comparable to the present finding. Specifically, these two studies did not take control over L2 prior performance when modeling the effect of L2 writing strategy use on L2 writing. Their lack of control over L2 performance may account for the discrepancy in Yang and Plakans (2012) and Yang (2012) finding and that of the present study.

The present finding may be better interpreted by an alignment with L2 writing studies that controlled for L2 prior performance (Lu, 2010). With such a control, these L2 writing studies may be viewed as an attempted answer to a call for examining how L2 proficiency affects L2 learners' use of writing strategies (Larios, Manchon, Murphy, & Marin, 2008). Lu (2010) is one of these studies that controlled for L2 prior performance when formulating inter-relational effects of cognitive variables on L2 writing. Using multiple regression analysis, Lu (2010) targeted L2 writing ability of Chinese undergraduates ($n=136$). Lu found English proficiency (i.e., grammar and vocabulary) explained 20.4% ($\beta= .365$) of the variance in L2 writing ability, genre knowledge 7.2% ($\beta= .197$), L2 writing strategy (i.e., strategies of planning, composing and difficulties during writing, revision during and after writing) 2.1% ($\beta= .168$), Chinese writing 0.5% ($\beta= .066$), and working memory capacity 0.3% ($\beta= .053$). Taken together, these variables explained 30.6% of the variance in L2 writing. Lu (2010) cast a control over prior performance when modeling the effect of L2 writing strategy on L2 writing ability. Such a control makes the first reason to justify a comparison between Lu's study and the present study. The second reason to

justify the comparison is how the item measures of L2 writing strategy were developed. Both studies adopted the item measures of Petrić and Czarl's (2003) L2 writing strategy scale, including strategies for writing, revising, and problem-solving in L2 writing. Then, the two studies tailored the item measures from Petrić and Czarl's (2003) to the respective purposes of the studies. Note that Lu (2010) showed that with a control over L2 proficiency the other cognitive variables strategy use only explained a small proportion of the variance in L2 writing, somewhat consistent with the present finding.

Despite the general consistency in the small explanatory power of L2 writing strategy, Lu's (2010) finding was slightly different from that of this study. In fact, Lu found their L2 writing strategy has a small but significant effect on L2 writing ability, while the present study identified a negligible effect of self-regulatory writing strategy on RA-abstract writing ability. This difference may be partially attributed to a few speculations below. First, L2 prior performance was operationalized in different ways. Lu (2010) operationalized it as English grammar and vocabulary knowledge. The present study operationalized it as L2 literacy of English reading and writing abilities. Apparently, the present study controlled for L2 prior performance in a broader way, L2 literacy. This broader control may explain a greater proportion of the systematic variance in the writing ability, making a better estimate on the effect of self-regulatory strategy on the ability. Second, Lu (2010) did not address motivation effect on L2 writing, while the present study identified a significant direct effect of motivation on RA-abstract writing ability ($\beta = .19$). This motivation effect may add more explanatory power to L2 ability, in addition to cognitive factors of L2 literacy and self-regulatory strategy.

Third, Lu's study might incorporate a wider variance in the L2 writing ability because their participants were L2 learners from diverse disciplines in undergraduate

programs in China and she reported L2 writing ability observed from English content score on a timed test ($mean=9.57, sd=1.96$) and English language score ($mean=9.03, sd=1.76$). However, the present study seems to incorporate a much narrower variance in L2 writing ability because the participants included L2 graduate students specifically in post-graduate programs of applied linguistics in Taiwan. And the study reported scores on RA-abstract writing including global move ($mean=1.63, sd=1.18$) and local pattern ($mean=2.42, sd=0.90$). Apparently, Lu (2010) captured more variance in the L2 writing ability of Chinese undergraduates (see *sds* reported above). A wider-range variance in test scores or variables is often advantageous to have better reliability of measure (Aiken & Groth-Marnat, 2006), which in turn may contribute to a stronger tendency to yield a significant interrelation between predictors and outcomes in statistical terms (i.e., higher predictive validities, Aiken & Groth-Marnat, 2006). In this sense, Lu's (2010) study is more likely to identify a significant effect of L2 writing strategy on L2 writing ability.

Fourth, Lu (2010) adopted multiple regression analysis that does not estimate the measurement error in the independent variables. The present study adopted SEM analysis that explicitly estimates the measurement error in the independent variables. By such explicit estimates, SEM analysis provides evidence for construct validity of the predictors in question, and in turn better estimates the interrelations between predictors and outcomes (Hair et al., 2010). Therefore the present study is more likely to accurately estimate the interrelations between predictors and outcomes. Fifth, Lu (2010) pinpointed the cognitive writing strategy, while the present study addressed the writing strategy from a wider perspective by including strategies of cognition regulation, motivation regulation, and socio-interactive resources regulation. This difference in definition of writing strategy may also partially contribute to the discrepancy in the L2 writing strategy effects between the two studies.

Given these differences between the two studies, a tentative conclusion can be made: Although the identified negligible effect of self-regulatory writing strategy on RA-abstract writing ability in this study appears different from Lu'(2010) finding, it may actually reflect the relative importance of the writing strategy to RA-abstract writing ability, alongside that of L2 literacy and motivation. However, more work is needed regarding to what extent this negligible strategy effect holds across varying L2 learning contexts of RA-abstract writing.

Non-significant effects of self-regulatory strategy. Aside from previous studies reporting significant effects of self-regulatory strategy, there are two studies reporting non-significant effects (Jones, 2008; Schwinger, Steinmayr, & Spinath, 2009). These two studies will be detailed below (Jones, 2008; Schwinger et al., 2009).

First, Schwinger et al. (2009) stated that motivation regulation (only the performance self-talk subscale of motivation regulation, Wolters, 1999) at best has showed a weak direct effect on high school students' course grade. In path analysis, Schwinger et al. (2009) adopted Pintrich's self-regulated learning theory and examined effects of motivation regulation and effort management on half-year grades (GPA) of 11th and 12th grade high school students in German (n=231) via path analysis. In particular, Schwinger et al. (2009) operationalized motivation regulation by Wolters et al's definition (2003), and further developed eight corresponding subscales (Schwinger, von der Laden, & Spinath, 2007): enhancement of situational interest, enhancement of personal significance, mastery self-talk, performance-approach self-talk, performance-avoidance self-talk, environmental control, self-consequating, and proximal goal setting. Likewise, the current study operationalized motivation regulation by Wolters et al.'s definition (2003) and adopted Wolters et al's three subscales of motivation regulation: relevance enhancement, self-talk, and self-consequating. This similarity in the subscales of

motivation regulation may allow a comparison of the present finding with Schwinger et al.'s (2009).

Schwinger et al. (2009) revealed that with a control over intelligence effect on GPA in a path model ($\beta=.25$), motivation regulation had a nonsignificant effect on GPA ($\beta=-.14$, *ns.*), similar to the present finding of a non-significant effect of self-regulatory writing strategy on RA-abstract writing ($\beta=-.05$, *ns.*) with a control over L2 literacy ($\beta=.53$). Despite this ostensible similarity in the two studies, there is a noteworthy distinction. That is, Schwinger et al. (2009) treated motivation regulation as an independent predictor, while the present study subsumes motivation regulation as a part of the predictor of self-regulatory writing strategy, alongside cognition regulation and socio-interactive resources regulation. In this sense, while comparing Schwinger et al.'s finding (2009) of non-significant direct effect of motivation regulation with that of self-regulatory writing strategy in the present study, caution is much needed.

Besides the non-significant effect of motivation regulation identified, Schwinger et al. (2009) revealed that effort management (a sole subscale operationalized) had a significant effect on GPA ($\beta=.29$), somewhat inconsistent with the non-significant effect identified in the present study. Notably, there is a distinction in how effort management was measured across the two studies. Schwinger et al. (2009) adopted a sole subscale of effort management, while the present study adopted three sub-constructs for this subscale: effort management, help-seeking, and time and environment management. Moreover, Schwinger et al. (2009) treated effort management as an independent predictor, while the present study treated the 3 effort-related sub-constructs as a part of the predictor of self-regulatory writing strategy, alongside the other two subscales of cognition regulation and motivation regulation. In this sense, while comparing Schwinger et al.'s finding (2009) of effort

management with that of the present finding, caution is much needed.

In sum, there are some similarities and differences in the findings of Schwinger et al. (2009) and the present study. To better interpret these similarities and differences, some distinctions in the two studies are noteworthy. First, Schwinger et al. (2009) controlled for intelligence, while the present study controlled for L2 literacy of reading and writing abilities. The control over L2 literacy in the current study seems more specific, and thus may explain a greater proportion of the systematic variance in the RA-abstract writing ability. Speculatively, this control may enable a better estimate on the effect of self-regulatory writing strategy on the ability. Second, Schwinger et al. (2009) adopted path analysis, while the present study adopted SEM analysis that explicitly estimates the measurement error of the predictors. By such explicit estimate, SEM analysis provides evidence for construct validity of the predictors in question, and in turn better estimates the interrelations between predictors and outcomes (Hair et al., 2010). In this sense, the present study is more likely to accurately estimate the interrelations between predictors and outcomes. Third, Schwinger et al. (2009) operationalized motivation regulation and effort management as two independent predictors for GPA of high school students in German. While targeting the outcome of RA-abstract writing ability of L2 graduate students in Taiwan, the present study operationalized self-regulatory writing strategy as a sole predictor that subsumes three strategy subscales, including cognition regulation, motivation regulation, and socio-interactive resources regulation. Apparently, the present study covers a much wider-range of self-regulatory writing strategies than Schwinger et al.'s study (2009). In this sense, when aligning the present finding with Schwinger et al.'s (2009) on the effect of regulation on achievement, caution is much needed.

Second, when it comes to the outcome of writing ability, regulation of

help-seeking and effort management does not seem always predictive. For instance, Jones (2008) defined these two concepts as positive academic behavior, and targeted undergraduate writers in a course of basic skills for English writing in Northeast United States (n=118, 24 of the participants were non-native English speakers). In a multiple regression analysis, while controlling for prior English performance (i.e., high-school English GPA ($\beta=.18, p <.05$) and pretest of writing ($\beta=.15, ns.$), the undergraduate writers' frequent positive academic behavior did not affect their final grades of writing class ($\beta=.003, ns.$) or writing posttests ($\beta=.015, ns.$). Apparently, Jones (2008) provided empirical evidence that help-seeking and effort management did not always effectively predict writing-class grades and writing posttest performance of undergraduate writers. Jones' (2008) finding bolstered the nonsignificant effect of self-regulatory writing strategy on RA-abstract writing in the present study.

However, some distinctions in Jones's finding (2008) and the present are noteworthy. Jones (2008) operationalized positive academic behaviors as help-seeking and effort management in predicting English writing ability of undergraduates in the United States. While targeting the outcome of RA-abstract writing ability of L2 graduate students, the present study operationalized self-regulatory writing strategy as a sole predictor that subsumes three strategy subscales, including cognition regulation, motivation regulation, and socio-interactive resources regulation. Apparently, the present study covers a much wider-range of self-regulatory writing strategies, than Jones' (2008) study. Therefore, caution is much needed, when a comparison is made between the two studies.

To conclude tentatively, the nonsignificant effect of self-regulatory writing strategy may not be entirely surprising, partially because the study (a) targeted a specific writing ability, RA-abstract writing ability that included a much smaller

proportion of the variance in the ability as compared to L2 writing in general (Lu, 2010), and (b) took control over the effects of L2/English literacy and motivation that explained quite a large proportion of the variance in the RA-abstract writing ability, as compared to previous studies on L2/English writing that cast no control (Yang & Plakans, 2012; Yang, 2012) or partial control (Lu, 2010) over these two effects. However, this interpretation is speculative in nature.

Hypothesis 3: Motivation has an indirect effect on writing ability via strategy (unsupported). Unexpectedly, this hypothesis was not supported. This result suggests that high motivation of interest value, utility value, cost, connectedness value, and ability self-concept did not indirectly contribute to a high RA abstract writing ability of global move and local pattern via frequent use of self-regulatory writing strategy, including cognition regulation, motivation regulation, and socio-interactive resources regulation ($\beta = -.02$, *ns.*), when performance of L2 literacy was controlled as a covariate.

The strong covariate effect of L2 literacy ($\beta = .53$) seemingly warrants consideration when comparing the present finding with the previous studies'. Thus, it may be reasonable to start with a comparison of Liem et al.'s (2008) study that controlled for past English achievement and examined Year-9 students' later achievement in Singapore ($\beta = .55$).

Using SEM analysis, Liem et al. (2008) examined indirect motivation effects on English achievement via achievement goals (i.e., mastery goal, performance-approach goal, and performance-avoidance goal), and then cognitive, behavioral, and social outcomes (i.e., deep-learning, surface-learning, task disengagement, and peer-relationship). Specifically, Liem et al. (2008) reported the indirect motivation effects as the effect of task value ($\beta = -.06$) and the effect of self-efficacy ($\beta = .04$). Liem et al.'s (2008) findings on the indirect motivation effects at a significant level are

apparently different from the present finding. This difference may be partially attributed to a few distinctions between the two studies. First, Liem et al. (2008) operationalized task value and self-efficacy as two separate motivational constructs, while the present study operationalized motivation as a unitary construct with five subscales, including interest value, utility value, cost, connectedness value, and ability self-concept. Second, Liem et al. (2008) had achievement goals mediating the interrelations between the motivation constructs and cognitive, behavioral, and social outcomes, while the present study did not include achievement goals. Third, Liem et al. (2008) operationalized cognitive, behavioral, and social outcomes with four constructs, including deep learning, surface learning, task disengagement, and peer relationship. The present study operationalized self-regulatory writing strategy as a unitary construct with three subscales, including cognition regulation, motivation regulation, and socio-interactive resources regulation.

Empirically, Liem et al. (2008) capitalized on a rather large-sized sample (n=1475) to explore English achievement of Year-9 students in Singapore. They could thus propose a more complex model. In contrast, when addressing RA-abstract writing of L2 graduate students in applied linguistics in Taiwan, this study was unable to locate a large-sized sample. This constraint of practicality makes the present study propose a relatively simple and parsimonious model at onset, rather than the complex one, which may partially contribute to the nonsignificant indirect effect of the motivation on the writing ability via self-regulatory strategy.

The nonsignificant indirect effect of motivation via strategy use. This study did not provide empirical evidence that learners' high learning motivation of expectancy and value triggers frequent use of self-regulatory strategy, which in turn leads to high achievement (Eccles & Wigfield, 2002; Liem et al., 2008; Wolters, 1998). That is, this study does not support an indirect motivation effect on achievement via strategy

proposed by existing research on expectancy-value theory and self-regulated learning theory (Eccles & Wigfield, 2002; Pintrich, 2004; Wolters et al., 2003).

Statistically, this non-significant indirect effect may be highly related to the nonsignificant direct effect of self-regulatory writing strategy discussed earlier in this chapter. In fact, identity-based writing motivation indeed had a significant direct effect on self-regulatory writing strategy ($\beta=.46$). However, this motivated use of strategy did not lead to a high RA-abstract writing ability. A possible explanation for this nonsignificant indirect effect may be largely related to the fact that self-regulatory writing strategy failed to exert a direct effect on RA-writing ability of L2 graduate students, when L2 literacy and identity-based writing motivation were controlled. The finding suggests that whether and how L2 graduate students can strategically attain motivated learning of RA-abstract writing may be far more complicated than expected.

The current study formulated the motivated abstract-writing model (the MAW model) by focusing on the interplay among identity-based writing motivation, self-regulatory writing strategy and a covariate of L2 literacy in explaining RA-abstract writing ability of L2 graduate students. As expected, L2 literacy served as a strong covariate explaining the largest proportion of the variance in RA-abstract writing ability ($\beta= .53$). Identity-based writing motivation had direct effect on the ability as well ($\beta= .19$). However, the sole indirect effect proposed in the MAW model from motivation to writing ability via strategy was identified as negligible, making this model less adequate in its explanatory power. Therefore, it may be of value discussing additional key variables for future studies to re-specify the MAW model. The following discussion will proceed by using conceptual frameworks of motivation theorists and L2 writing theorists.

Additional variables from conceptual frameworks of motivation theorists.

Drawing upon conceptual frameworks of motivation theorists (e.g., Pintrich, & Zucko, 2002; Schwinger et al., 2009; Wigfield et al., 2006; Wolters, 1999, 2011), the MAW model may be re-specified by adding additional variables such as procrastination level (Jones, 2008; Wolters, 2003) and task disengagement (Liem et al., 2008). While considering these additional variables alongside self-regulated strategies, the indirect effect of motivation on achievement via self-regulated learning may be enhanced (Jones, 2008; Howell & Watson, 2007; Liem et al., 2008; Steel, 2007; Wolters, 2003; Zimmerman, 2008). In fact, Wolters (2003) maintains that procrastination becomes salient when undergraduate students face effortful and time-consuming tasks.

Particularly for the demanding task, procrastination alongside self-regulated learning is found as a key mediator between motivation and achievement, because it serves as counter-evidence for effective self-regulated learning (Howell & Watson, 2007; Wolters et al., 2003; Zimmerman, 2008). Note RA-abstract writing is often perceived as an effortful and daunting task. Thus, the mediating role of procrastination between motivation and achievement may come into play.

Recently, procrastination has been discussed in terms of its potential predictors and effects (Steel, 2007; Wolters, 2003). First, Wolters (2003) investigated undergraduates enrolled in history or psychology course in an urban university (study 1, n=168; study 2, n=152). In multiple regression analysis, Wolters (2003) found that procrastination could be predicted by self-efficacy, work-avoidance goal, and a less degree of metacognition. Second, Steel (2007) conducted a meta-analysis on procrastination's potential predictors and effects on 691 correlations. His results revealed that strong predictors of procrastination included task aversiveness, task delay, self-efficacy, self-control, distractibility, organization, and achievement motivation. He also indicated that the effects of procrastination were often pernicious to academic

performance. According to Steel's (2007) findings, procrastination can be predicted by achievement motivation, and in turn negatively affect academic performance.

Therefore, future studies could include procrastination as an additional key variable mediating motivation and achievement. The explanatory power of the MAW model might thus be increased.

In addition to procrastination, task disengagement may be another key variable to include when re-specifying the MAW model. For instance, Liem et al. (2008) reported task disengagement as a key mediator when examining the indirect motivation effect on English achievement of Grade-9 students in Singapore. This indirect motivation effect on achievement was reportedly mediated by achievement goals (i.e., latent constructs of mastery goal, performance-approach goal, and performance-avoidance goal), and then cognitive, behavior, and social outcomes (i.e., latent constructs of deep learning, surface learning, peer relationships, and task disengagement). When operationalizing the latent construct of task disengagement, Liem et al. (2008) took negatively worded items from the scale of effort regulation in the MSLQ (Pintrich et al., 1993), yet did not reverse coding. Sample items are "When the work in English is difficult, I give up." and "When the work in English is dull and boring, I stop doing it even if it is incomplete" (Liem et al., 2008, p. 496).

Note that Liem et al. (2008) adopted Eccles et al.'s (1983) expectancy-value theory and Pintrich et al.'s (1993) self-regulated learning theory, just like the current MAW model. Thus, their finding that task disengagement is a key mediator between motivation and achievement seems worth considering when discussing direction for re-specifying the MAW model. By adding task disengagement as an additional mediator between writing motivation and ability, the explanatory power of the MAW model may be increased.

In sum, to increase explanatory power, future studies may re-specify the present

MAW model. Particularly between the writing motivation and ability, future studies that have access to a large sample may add in additional mediators (e.g., procrastination level or task disengagement), alongside the mediator of the self-regulatory writing strategy.

Additional variables from conceptual frameworks of L2 writing theorists.

Moreover, based on conceptual frameworks of L2 writing theorists (Bhatia, 2004; Cheng, 2006, 2007; Hyland, 2002; Lu, 2010), the MAW model may include additional variables that affect the strategy effect on achievement, such as genre knowledge and assessment procedure. First, genre knowledge is defined as “a resource to exploit generic conventions to respond appropriately to the requirements of disciplinary and professional practices” (Bhatia, 2004, p. 208), or as an awareness of discourse parameters that includes writer, reader, purpose, and content in a context-dependent manner (Cheng, 2007, 2008; Flowerdew, 2011; Hyland, 2000). Having sufficient genre knowledge for RA-abstracts will enable L2 graduate students to know more about the relations of writer and readers, the readers’ major concerns, purposes of their RA-abstracts, and key elements of content to include in RA-abstracts (e.g., “propositional contents” in Flowerdew’s (2011) term). Thus, genre knowledge may be a good predictor of L2 graduate students’ RA-abstract writing ability. In a similar vein of thinking, Lu (2010) focused on L2 writing in general. She pointed out this “tacit” genre knowledge could account for 7.2% of the variance in L2 writing ability of Chinese students, alongside 20.4% of English proficiency, 2.1% of L2 writing strategy, 0.5% of Chinese writing score, and 0.3% of working memory capacity (Lu, 2010). Apparently, genre knowledge could be a predictor of L2 writing ability.

Despite this recognition of genre knowledge as a potential key predictor for L2 writing, a comprehensive coverage of genre knowledge of RA-abstract writing was

far beyond the scope of the study. The study merely addressed a handful of issues on genre knowledge in the Self-regulatory Writing Strategy Inventory (SWSI), such as two items on readers' expectations. In particular, these two items were adopted from a descriptive synthesis of RA writing strategies by Flowerdew (1999a): "I relate the anticipated audience to my English RA-abstract by predicting the knowledge and attitudes the audience will have," and "In my English RA-abstract, I present knowledge claims with the caution expected by the academic community."

Despite this initial inquiry into writer-reader relation, a thorough inquiry into the participants' genre knowledge (i.e., knowledge of writer, reader, purpose, and content) has yet to be launched, and therefore should be started in future studies. A possible start would be an inquiry into genre knowledge of what contents should be included to ensure effectiveness of RA-abstract writing. This content-related genre knowledge may be of great importance, because it may affect how effectively L2 graduate students can write RAs in the face of certain writing requirements (i.e., high-stake submissions to conferences and journals) (Bhatia, 2004; Swales & Feak, 2009). Moreover, such questions on content-related genre knowledge already can be found in Lu's (2010) study on general L2 writing: "Before I started writing, I read the prompt carefully to make sure what was required." and "I thought of what content I should include before I started writing." Besides questions on the content-related genre knowledge, questions on other aspects (e.g., writer, reader, and purpose) of genre knowledge should be incorporated as well to make a thorough inquiry into genre knowledge. If genre knowledge could be included as a mediator between writing motivation and ability, it may increase the capability of the MAW model in explaining development of RA-abstract writing.

Another possible variable for the MAW model could be assessment procedure of RA-abstract writing in classroom practice. In fact, eight second-year MA participants

(out of 185 participants in total) expressed concerns over how RA-abstract writing ability was often addressed in classroom practice. They elaborated that although abstract-writing ability was explicitly instructed in the course of academic writing, it was less so in other courses where only research proposals or full papers were required. Thus, they often perceived less emphasis on RA-abstract writing in classroom practice. However, they keenly recognized the importance of abstract-writing ability in engaging in high-stakes scholarly activities outside classroom, including conference and journal submissions, and thesis or dissertation completion. Presumably, the participants described a phenomenon common to most classroom practices. It could be speculated that although they reported frequent use of RA-abstract writing strategy, they actually seldom applied it when writing assignments tailored to their course requirements. That is, the course requirements did not necessarily focus on abstract-writing. Regarding the course requirements, abstract-writing ability might be largely under-addressed, as compared to other parts of research-article writing.

If course requirements can include direct assessment of abstract-writing, the participants are more likely to write more RA-abstracts. Moreover, such direct assessment on abstract-writing may make genre practice in classroom relatively akin to that in authentic academic activities (e.g., conference and journal submissions, and thesis and dissertation completion). Through this assessment procedure, L2 graduate students are more likely to receive adequate training on how to use self-regulatory strategies for writing RA-abstracts acceptable to their disciplinary community. From the participants' perspective, assessment procedure of RA-abstract writing appears a key factor affecting their achievement in RA-abstracts. If assessment procedure could be included as a mediator between writing motivation and ability (e.g., learners' perception on whether and how course requirements ask for writing RA-abstract

alongside the entire research articles), it may increase the capability of the MAW model in explaining the development in RA-abstract writing.

To sum up, since the study found a non-significant indirect effect of motivation on writing ability via writing strategy, a call for re-specifying the MAW model has been made by discussing a few potential mediators between motivation and ability. These mediators may include additional behavior variables (e.g., procrastination and task disengagement) through motivational lens, and genre knowledge or assessment procedure through L2 writing lens.

The direct effect of motivation on strategy use. Despite the unexpected non-significant indirect effect of motivation on ability via strategy, the study identified a moderate, direct effect of motivation on strategy use ($\beta=.46$). This result suggests that a high level of identity-based writing motivation including interest value, utility value, cost, connectedness value, and ability self-concept may increase L2 graduate students' reported use of self-regulatory writing strategy including cognition regulation, motivation regulation, and socio-interactive resources regulation. This finding supports theories of identity-based motivation (Oyserman et al., 2002; Oyserman & Destin, 2010), expectancy-value (Eccles & Wigfield, 2002; Eccles, 2009), self-regulated learning (Pintrich, 2004; Wolters et al., 2003; Wolters, 2011), and L2 self-regulatory strategy learning (Oxford, 2011). The finding also supports empirical studies on how motivation positively affects strategy use in general subjects learning (Bruinsma, 2004; Miller et al., 1996; Pokay & Blumenfeld, 1990; Wolters, 1998, 1999), and on how L2 motivation positively affects self-regulated L2 learning (Liem et al., 2008; Tseng & Schmitt, 2008).

The direct motivation effect on strategy use which also supported a direct effect of motivation on strategy use may be better interpreted by a detailed comparison with two studies below. First through SEM analysis, Bruinsma (2004) investigated

undergraduate freshmen's expectancy (subscales of procrastination), task values (subscales of intrinsic value), negative affect (subscales of incompetence fear and test anxiety) and deep information processing (subscales of critical reading, broadening one's context, and structuring) in a 2-year project in Netherlands (n=565). In the first year, task value directly affects deep information processing both at onset ($\beta=.32$) and at end ($\beta=.17$), expectancy affects deep information processing at onset ($\beta=-.23$) and at end ($\beta=-.11$), and negative affect affects deep information processing only at end ($\beta=-.12$) (Bruinsma, 2004). In the second year at the end, task value affects deep information processing ($\beta=.07$), expectancy affects deep information processing ($\beta=-.19$), and negative affect affects deep information processing ($\beta=.08$). Among these direct effects of motivation, effects of task value on deep information processing appear relatively comparable to the present finding. Meanwhile, effects of expectancy and negative affect on deep information processing may be considered as well, although these item measures were developed by negative wording.

It should be noted that Bruinsma (2004) operationalized motivation as three constructs (i.e., task value, expectancy for procrastination, and negative affect). He operationalized deep processing as a unitary construct subsuming subscales of critical reading, broadening one's context, and structuring. By contrast, the present study operationalized motivation as a unitary construct consisting of interest value, utility value, cost, connectedness value, and ability self-concept, and self-regulatory writing strategy, as a unitary construct subsuming cognition regulation, motivation regulation, and socio-interactive resources regulation. This difference in the operationalization of motivation and strategy warrants attention when interpreting the findings in the two studies.

Second running multiple regression analysis, Miller et al., (1996) investigated how well learning goals, future consequence, pleasing others, and perceived ability

explained engagement (i.e., deep strategy, self-regulation, effort, and persistence) of high school math students in the mid-south of the United States ($n=297$). They found that 52% of the variance in self-regulation could be explained by learning goals ($\beta= .39$), perceived ability ($\beta= .33$), pleasing the teacher ($\beta= .15$), and future consequences ($\beta= .15$). Likewise, 32% of the variance in deep strategy could be explained by learning goals ($\beta= .50$), and future consequences ($\beta= .18$). Moreover, 12% of the variance in effort could be explained by learning goals ($\beta= .35$) and 29% of the variance in persistence (e.g., persistence was also operationalized under the socio-interactive resources regulation scale in the present study) could be explained by learning goals ($\beta= .27$) and by perceived ability ($\beta= .34$). Note that Miller et al. (1996) generally adopted Eccles' expectancy-value theory and Pintrich's self-regulated learning theory when developing their item measures, similar to the present study. This similarity in item measures may relatively justify an alignment of Miller et al.'s findings (1996) with the present finding of the direct motivation effect on self-regulated strategy ($\beta= .46$). However, it is noteworthy that there are differences between the two studies, such as learning tasks (math in high schools versus RA-abstract writing in post-graduate programs), statistical analyses (multiple regression versus structural equation modeling). Given these differences, caution is much needed when interpreting the findings across the two studies.

As shown in previous research, the direct motivation effect on strategy has been found as quite consistent, revealing that once individuals are highly motivated for a learning task, they tend to adopt more strategies in approaching task-achievement (Bruinsma, 2004; Miller et al., 1996; Wolters, 1998, 1999). This finding also suggests that if learners and instructors seek frequent use of self-regulatory RA-abstract writing strategy, holding high identity-based writing motivation is indispensable. In particular, both learners and instructors need to be aware of the importance of motivation to

activating, altering, and eventually attaining their strategic learning of RA writing.

Theoretically, this direct motivation effect on self-regulatory writing strategy supports Eccles' expectancy-value theory (Eccles & Wigfield, 2002; Pintrich, 2004) and Oyserman's identity-based motivation theory (Oyserman et al., 2002; Oyserman & Destin, 2010). In particular, the finding indicates that this motivation effect is applicable to an RA-abstract writing task that is disciplinarily-specified and socially-directed. That is, RA writing motivation was formulated as an identity-seeking process in which L2 graduate students seek an identity as non-native-English-speaking researchers by learning to write English RAs acceptable to their disciplinary communities. In this identity-seeking process, once L2 graduate students are motivated to learn RAs writing, they will often increase their use of self-regulatory writing strategy for RA-abstract writing. The present finding corroborates Oyserman and Destin's (2010) statement that identity-based motivation serves as a trigger for individuals' subsequent learning actions directed towards learning achievement critical to their future identities. Since the finding confirms the direct motivation effect on strategy use in RA-abstract writing, it contributes to extension of the application of expectancy-value theory and identity-based motivation theory from learning tasks in general settings (Bruinsma, 2004; Eccles & Wigfield, 2002; Miller et al., 1996; Oyserman et al., 2002; Oyserman & Destin, 2010) to a disciplinarily-specific and socially-directed task in post-graduate programs.

Implications

Implications for the sketch of a motivated RA writer. Through a motivational lens, the present study tested a motivated RA-abstract writing model, which conceptualizes the role of identity-based writing motivation and use of self-regulatory writing strategy in explaining RA-abstract writing ability of L2 graduate students with

L2 literacy as a covariate. The results revealed that L2 literacy serves as a strong covariate and identity-writing motivation has a direct effect on RA-abstract writing ability. Also, the results showed that self-regulatory writing strategy did not have a direct effect on writing ability and motivation thereby did not have an indirect effect on writing ability via strategy.

Note that both the direct effect of self-regulatory writing strategy and the indirect effect of motivation via strategy are negligible. The findings appear counter-intuitive and infertile in producing a sketch of a motivated RA writer, considering that the self-regulatory writing strategy was assumed as motivated learning engagement that L2 graduate students demonstrated when they became motivated to write RAs. However, the negligible effect of self-regulatory writing strategy does not necessarily mean that self-regulatory writing strategy is unhelpful and therefore should be completely abandoned. Instead, these findings suggest that the proposed MAW model may be too simple to represent how self-regulatory writing strategy is effective in explaining achievement in RA-abstract writing ability. A more complex model may be needed, such as adding additional variables to the MAW model, including procrastination level and task disengagement through motivational lens (Wolters, 2003; Liem et al., 2008) and genre knowledge and assessment procedure through L2 writing lens (Cheng, 2007; Lu, 2010; Flowerdew, 2011). Clearly, how these additional variables interact with self-regulatory writing strategy in explaining the RA-abstract writing ability requires future studies. Although drawing a complete picture of a motivated RA-writer apparently requires future research agenda, the present study contributed to a rough sketch that highlights the importance of L2 literacy and identity-based writing motivation in RA-abstract writing.

Meanwhile, because RA-abstract serves as a miniature of the whole RAs (Swales & Feak, 2009), a motivated RA-abstract writer is more likely to be motivated to write

the whole RA as well. Thus, this sketch of a motivated RA-abstract writer may be relatively generalizable to a picture of motivated RA writers.

Implications for L2 RA writing instruction. The findings of the study have important implications for RA writing instruction of L2 graduate students. The findings indicated that L2 literacy of reading and writing had the strongest direct effect on the RA-abstract writing ability, as compared to identity-based writing motivation and self-regulatory writing strategy. However, L2 literacy did not explain all the variance, while identity-based writing motivation had its own independent explanatory power. That is, although L2 literacy is conducive to better RA-abstract writing ability, a high L2 literacy alone does not necessarily lead to high RA-abstract writing ability. High RA-abstract ability seems to be influenced by additional variables, such as motivation. In this sense, L2 literacy can be viewed as *sine qua non*, but not as a synonym for RA-abstract writing ability. If having high RA-abstract writing ability is a goal of learning, L2 graduate students may need to acquire high L2 literacy at first. On the premise of harnessing high L2 literacy, L2 graduate students still need to take care of other factors when they write. A promising start of learning may be to understand their own motivation profiles for RA-abstract writing, and in turn to launch the motivated learning. Accordingly, they may incrementally acquire a high RA-abstract writing ability. Likewise, RA writing instructors of L2 graduate students need to be aware of and able to diagnose the source of students' writing problems, such as inadequate L2 literacy, lack of motivation, lack of writing skills, or some other reasons and design their curricula accordingly.

In addition to L2 literacy, the direct effect of identity-based writing motivation deserves more attention in RA writing instruction. The current genre research often describes L2 graduate students' motivated learning of RA writing in terms of identity-seeking process in which L2 graduate students seek a future researcher

identity through writing RAs acceptable to their chosen fields (Chang & Kanno, 2010; Hsieh & Liou, 2008; Huang, 2010). Despite these growing research findings, it is not uncommon for instructors of RA-writing to neglect this identity-seeking process. Most instructors often stress skills necessary to write acceptable RAs, but rarely stress “will” to learn the skills. Will is a drive to promote individuals’ enthusiasm and engagement in learning at present and throughout lifetime. Without will to learn, individuals could hardly develop the skills in a successful and sustainable manner throughout learning process. Following this logic, this study revealed that “will” (i.e., identity-based writing motivation) plays a key role in explaining RA-abstract writing ability. That is, besides skills for RA writing, instructors should also recognize and stress the importance of identity-based writing motivation in RA writing. Specifically, instructors should emphasize that if L2 graduate students wish to succeed in learning of RA writing, they should understand or even increase their identity-based writing motivation. L2 graduate students can be encouraged to conceptualize motivation for RA writing as an identity-seeking process in which they seek a future identity of non-native-English-speaking (NNES) researchers by learning to write RAs acceptable to their disciplinary communities. If L2 graduate students have a strong intention to achieve this future-researcher identity, they may assign higher values to learning of RA writing and expect themselves to attain higher ability. With higher value and expectancy, L2 graduate students may launch, sustain, and protect the learning until they perceive the learning as relatively completed. Accordingly, L2 graduate students are more likely to acquire relatively high RA writing ability at present or throughout lifetime.

On the other hand, the nonsignificant effects of self-regulatory writing strategy as a predictor of RA-abstract writing ability and mediator between motivation and writing ability are also worth noting. Despite these nonsignificant effects, the results

do not necessarily characterize self-regulatory writing strategy as a derogatory force in RA-writing pedagogy. That is, the findings do not suggest that use of self-regulatory writing strategy is absolutely ineffective, and therefore should be completely abandoned in pedagogy. Instead, the finding suggests the need for a closer linkage between strategy and ability in question. A possible start for building such a linkage may be specifying the expertise needed for the ability (e.g., writing ability for conference proceedings, journal articles, or theses and dissertations). For example, expertise of RA-abstract writing ability may be first defined by specific criteria, like what tentatively exhibits in the two rating scales in the study (i.e., content, move, language use, and brevity of RA-abstract writing). Subsequently, instructors may encourage L2 graduate students to meet these writing criteria by adopting appropriate and relevant writing strategies, such as by making effective effort to regulate cognition, motivation, behavior, and context. In this strategic attempt at meeting the writing criteria, L2 graduate students are more likely to perform well on RA-writing ability. However, how effective such a closer linkage is in explaining a high RA-writing ability remains largely known, needing further research.

To sum up, the findings indicate that when aiming to cultivate L2 graduate students' English RA-abstract writing ability, instructors first need to enhance students' L2 literacy. Second, students with higher motivation were found to write better. Instructors should not only address skill for RA writing, but teach students how to recognize, stimulate, and sustain their identity-based writing motivation so as to effectively enhance their RA-abstract writing ability. However, students who use more writing strategies do not necessarily lead to a better writing ability. The effectiveness of strategy use requires future studies.

Implications for theory. Through a lens of Eccles' expectancy-value theory (2009) and Oyserman's identity-based theory (Oyserman & Destin, 2010), the present

study provided preliminary support for a motivated abstract-writing model (the MAW model). Specifically, the study confirmed L2 literacy as a strong covariate, and a direct effect of identity-based writing motivation on RA-abstract writing ability, but it did not confirm the direct effect of self-regulatory writing strategy and the indirect effect of motivation via strategy. The significant covariate effect indicates that L2 literacy (i.e., reading and writing abilities) reflecting L2 graduate students' prior performance in English plays a key role in explaining RA-abstract writing ability. Thus, the finding supports Lu's (2010) L2 writing theory and some empirical studies on L2 graduate students' RA writing (Bitchener & Basturkmen, 2006; Cheung, 2010a), particularly for the claim that high L2 literacy serves as a prerequisite for high RA writing ability.

The fact that identity-based writing motivation acts as an effective predictor of RA writing ability may lend support to a synthesis of the identity-based motivation theory (Oyserman, Terry, & Bybee, 2002; Oyserman & Destin, 2010), the expectancy-value theory (Eccles et al., 1983; Eccles, 2009), the socio-educational theory (Gardner, 1985; 2007), and the genre theory (Swales, 1990; Swales & Feak, 2004). This synthesis was attempted by the following specifications. First, motivation here is specified as identity-based writing motivation to address Eccles' (2009) proposal of incorporating her expectancy value theory into the identity-based motivation theory (Oyserman et al., 2002; Oyserman & Destin, 2010). Second, the motivated-learning task was specified as RA writing. Third, motivated learning of writing is subsequently specified as an identity-seeking process stated in the genre theory (Swales, 1990). That is, identity-based writing motivation is conceptualized as an identity-seeking process in which L2 graduate students will become motivated to write if they seek a future researcher identity by writing RAs acceptable to their chosen fields (Swales & Feak, 2004, 2009). Through this identity-seeking lens,

identity-based writing motivation represents a contextualized pursuit of “collective identity” (Eccles, 2009) or “possible identities” (Oyserman & Destin, 2010) in a given learning community. By these specifications, the current identity-based writing motivation attempted to synthesize the expectancy-value theory, the identity-based motivation theory, and the genre theory. In this sense, the finding of the direct motivation effect here provides preliminary support for such a synthesis.

Besides the synthesis above-mentioned, the study aimed to synthesize Gardner’s socio-educational theory via operationalizing the sub-constructs of the identity-based writing motivation. Specifically, when describing identity-based writing motivation, the study adopted the four motivational sub-constructs from the Eccles expectancy-value theory (Eccles et al., 1983), interest value, utility value, cost, and ability self-concept. In addition, the study specified attainment value in the expectancy-value theory as connectedness value that reflects L2 graduate students’ subjective appraisals of reasons and benefits for socializing into a chosen disciplinary community by writing RAs acceptable to the community. This specification of connectedness value partially characterizes the attempted synthesis on the expectancy-value theory, the identity-based motivation theory, and the genre theory stated earlier. Meanwhile, the connectedness value can be viewed as a specification of integrativeness as “openness to cultural identification, and/or a favorable attitude and interest in English-speaking [target language] communities” proposed by Gardner (2007, p. 16). By the connectedness value, the newly-developed identity-based writing motivation shows a possibility to synthesize Gardner’s socio-educational theory alongside Oyserman’s identity-based motivation theory, Eccles’ expectancy value theory, and the Swalestian genre theory. The synthesis of the four theories suggests that the identity-based writing motivation can capture the common construct of collective identity among the aforementioned theories. Adopting this writing

motivation, researchers may reduce the complexity of their research design. Moreover, it allows future studies to synthesize findings on these theories, enabling a wider generalization of the identity-based writing motivation in L2 learning.

On the other hand, self-regulatory writing strategy, defined as perceived efforts that individuals make to effectively regulate cognition, motivation, behavior and context to better approach RA-abstract writing, did not act as a predictor of writing ability or a mediator between motivation and ability. Therefore, this study did not support Pintrich (2004) and Wolters et al.'s (2003) self-regulated learning theory in a straightforward manner. Rather, the study points out a need to continue investigating whether and how motivated use of self-regulatory writing strategy will contribute to higher RA-abstract writing ability.

Limitations and Suggestions

Several limitations of the study warrant attention. First, since the present study adopts a cross-sectional design, interpreting the findings of direct effects as robust causal relations among variables can be problematic. Despite the finding of direct effects of L2 literacy and motivation on RA-abstract writing ability, the researcher hesitates to interpret such effects as robust causal relations until longitudinal data are available for further support. Longitudinal studies should be conducted in the future.

Second, instead of using a stratified sampling on graduate students in various universities in Taiwan, the researcher only recruited 185 graduate students (i.e., master's and doctoral students) from public and private universities in northern Taiwan, on a voluntary basis. Although this volunteer-based recruitment relatively secures the participants' response against inadequacy (i.e., chances for indisposition of the participation may be largely reduced in this case), it poses great constraints on the generalizability of the findings. To cross-validate this finding, stratified sampling

across the nation is needed in future studies.

Third, the study only discusses the optimal model-fit according to the model proposed at onset, although alternative models may exist to better explain the data. Such alternative models may be proposed and tested in the future studies.

Fourth, the present study used self-report survey on self-regulatory writing strategy. Whether self-report survey can fully represent engagement in learning remains hotly-debated in educational psychology research (Bernacki et al., 2012) and in L2 learning research (He, 2005; He, Chang, & Chen, 2012). To better capture engagement in learning RA-abstract writing, other measures (e.g., think-aloud protocol, and behavioral tracking devices) should be included in future studies.

Fifth, the study failed to reveal that use of self-regulatory writing strategy is conducive to high RA-abstract writing ability when L2 literacy and identity-based writing motivation were controlled. Because this study focused on an overall perception that L2 graduate students hold toward their use of self-regulatory strategy for RA-abstract writing, future studies should investigate L2 graduate students' use of the writing strategy by a finer-grained analysis on the appropriateness of the strategy use. For instance, such appropriateness can be approached by the effectiveness and quality of the strategy use (Bernacki et al., 2012; He et al., 2012; Manchon, 2008; Tseng et al., 2006). In addition, future studies should address a more complex model, adding mediators between strategy use and ability, such as procrastination level, task disengagement, genre knowledge, and assessment procedure.

Sixth, the study measured the participants' RA-abstract writing ability by a timed abstract-writing task. Timed writing task is well-recognized as the most direct and common assessment of one's writing ability, and thus it has been adopted in many large-scale language proficiency tests (e.g., GEPT, IELTS, and TOFEL), and in empirical studies (Lu, 2010; Yang, 2012; Yang & Plakans, 2012). However, quite a few researchers

cast doubt on whether such timed writing task can truly represent a learners' overall writing ability (Brown, 2004; Schoonen et al., 2003). This doubt may become more serious when addressing research-article abstract writing ability. In fact, RA-abstract writing ability to date has yet to be officially assessed in any language proficiency tests, despite the fact that this ability is well-recognized as essential for L2 graduate students in presenting their studies effectively according to the norms of their chosen fields (Swales & Feak, 2009). Given this apparent relevance of RA-abstract writing to L2 graduate students, it may be justifiable to develop a test for RA-abstract writing ability so that L2 graduate students' strengths and weaknesses in RA-abstract writing can be diagnosed. To dispel the doubt about timed writing task, multiple assessments of non-test performances (e.g., assignments for RA-writing) should be considered. The current study did not include multiple writing assessments due to the practicality concerns over time-constraint and an already complex battery of questionnaires and tests. Future studies should include multiple assessment of non-test performances (e.g., course grades, assignment, and portfolio of RA writing) as an alternative or additional measure of RA writing ability.

Seventh, the present study investigated RA-writing ability of L2 graduate students with a sole focus on RA-abstract writing ability. Writing ability of the other parts of RAs (e.g., Introduction-Method-Results-Discussion) was not investigated. RA-abstract has been commonly recognized as a miniature of the whole RA (Swales & Feak, 2009; 2010; Liou et al., 2011). In this sense, RA-abstract seems to serve as a useful indicator of how well L2 graduate students can write RAs. This focus on RA-abstract also makes it possible to assess RA-abstract writing ability in a timed writing task. Nevertheless, the ability to write other parts of RAs warrants further investigations. Regarding these limitations, caution is much needed when generalizing the findings here.

Conclusion

The present study investigated the relative importance of L2 literacy, identity-based writing motivation and use of self-regulatory writing strategy in explaining research-article abstract writing ability of EFL graduate students majoring in applied linguistics in Taiwan. Using a battery of measures for these variables on a sample of 185 graduate students, results of the structural equation modeling analyses confirmed L2 literacy as a strong covariate ($\beta=.53$) and a direct effect of identity-based writing motivation on RA-abstract writing ability ($\beta=.19$). The results neither supported a direct effect of self-regulatory writing strategy, nor an indirect effect of motivation via strategy on writing ability. Additionally, the results supported a direct effect of motivation on strategy use ($\beta=.46$). These findings contribute to a better understanding of what makes a motivated, competent RA-writer from the perspectives of motivation in educational psychology (Eccles et al., 1983; Eccles, 2009; Oyserman et al., 2002; Oyserman & Destin, 2010), motivation in L2 learning (Gardner, 1985; 2007), and genre in L2 RAs writing (Swales & Feak, 2004, 2009). The findings of this study also suggest implications for RA writing assessment and instruction.

References

- Aiken, J. & Groth-Marnat, G. (2006). *Psychological testing and assessment*. (12th edition). Boston: Allyn and Bacon.
- Alexander, P.A., Graham, S., & Harris, K. R. (1998). A perspective on strategy research: Progress and prospects. *Educational Psychology Review*, *10*, 129-154.
- American Psychological Association. (2010). *Publication manual of the American Psychological Association* (6th edition). New York: American Psychological Association.
- Anderson, J. C. & Gerbing, D. W. (1988). Structural equation modelling in practice: A review and recommended two-steps approach. *Psychological Bulletin*, *103*(3), 411-423.
- Armengol-Castells, L. (2001). Text generating strategies of three multilingual writers: a protocol-based study. *Language awareness*, *10* (2), 91-106.
- Atkinson, J. W. (1957). Motivational determinants of risk taking behavior. *Psychological Review*, *64*, 359–372.
- Atkinson, D. (2003). L2 writing in the post-process era. *Journal of Second Language Writing*, *12*(1), 3-15.
- Bachman, L., & Palmer, A. (1996). *Language testing in practice*. New York: Oxford University Press.
- Bagozzi, R. P., & Yi, Y. (1988). 'On the evaluation of structural equation models,' *Journal of the Academy of Marketing Science*, *16* , 74–94.
- Battle, A., & Wigfield, A. (2003). College women's value orientations toward family, career, and graduate school. *Journal of Vocational Behavior*, *62* (1), 56-75.
- Becker, (2011). Examining rubrics used to measure writing performance in U.S. intensive English programs. *The CATESOL Journal*, *22*(1), 113-130.
- Beeth, M. E., Cross, L., Pearl, C., Pirro, J., Yagnesak, K., & Kennedy, J. (2001). A continuum for assessing science process knowledge in grades K-6. *Electronic Journal of Science Education*, *5*(3). Retrieved January 12, 2012 from: <http://ejse.southwestern.edu/article/view/7657/5424>
- Belcher, D. (2002). The apprenticeship approach to advanced academic literacy: Graduate students and their mentors. *English for Specific Purposes*, *13*(1), 23–34.

- Bereiter, C., & Scardamalia, M. (1987). *The psychology of written composition*. Hillsdale, NJ: L. Erlbaum.
- Bernacki, M., Byrnes, J. Cromley, G. (2012). The effects of achievement goals and self-regulated learning behaviors on reading comprehension in technology-enhanced learning environments. *Contemporary Educational Psychology*, 37, 148-161.
- Bhatia, V. (1993). *Analyzing genre: Language use in professional settings*. New York: Longman.
- Bhatia, V. (2004). *Worlds of written discourse: A genre-based view*. London: Continuum.
- Bitchener, J., & Basturkmen, H. (2006). Perceptions of the difficulties of postgraduate L2 thesis students writing the discussion section. *Journal of English for Academic Purposes*, 5(1), 4–18.
- Bloom, M. (2008). Second language composition in independent settings: Supporting the writing process with cognitive strategies In S. Hurd & T. Lewis (Eds.), *Language learning strategies in independent settings* (pp. 103-118). Bristol, UK: Multilingual Matters.
- Brown, H. D. (2004). *Language assessment: Principles and classroom practices*. White Plains, NY: Pearson Education, Inc.
- Bruinsma, M. (2004). Motivation, cognitive processing and achievement in higher education. *Learning and instruction*, 14, 549-568.
- Byrne, B., (1989). *A Primer of LISREL: Basic applications and programming for confirmatory factor analytic models*. New York, NY: Springer.
- Byrne, B., Shavelson, R., & Muthen, B., (1989). Testing for the equivalence of factor covariance and mean structure: The issue of partial measurement invariance. *Psychological Bulletin*, 105, 456-466.
- Chamot, A. (2005). Language learning strategy instruction: Current issues and research. *Annual Review of Applied Linguistics*, 25, 112-130.
- Chang, Y. J. & Kanno, Y. (2010). NNES doctoral students in English-speaking academe: The nexus between language and discipline. *Applied Linguistics*, 31(5), 671-692.
- Carmines, E. G., & McIver, J. P. (1981). Analyzing models with unobservable variables. In G. W. Bohrnstedt & E. F. Borgatta (Eds.), *Social measurement: Current issues* (pp. 65–115). Beverly Hills, CA: Sage Publications.

- Cheng, A. (2006). Understanding learners and learning in ESP genre-based writing instruction. *English for Specific Purposes*, 25, 76–89.
- Cheng, A. (2007). Transferring generic features and recontextualizing genre awareness: Understanding writing performance in the ESP genre-based literacy framework. *English for Specific Purposes*, 26, 287-307.
- Cheng, A. (2008). Analyzing genre exemplars in preparation for writing: The case of an L2 graduate student in the ESP genre-based instructional framework of academic. *Applied Linguistics*, 29(1), 50-70.
- Cheng, A. (2011). Language features as the pathways to genre: Students' attention to non-prototypical features and its implication. *Journal of Second Language Writing*, 20, 69-82.
- Cheung, Y. L. (2010a). First publications in refereed English journals: Difficulties, coping strategies, and recommendations for student training. *System*, 38, 134-141.
- Cheung, Y. L. (2010b). Challenges in writing refereed English journal papers and institutional support on research publication. *Asian Journal of English Language Teaching*, 20(1), 207-224.
- Chin, Y. M. (2003). *The effects of metacognitive strategy instruction on EFL writing: A case study*. Unpublished master's thesis, National Tsing-Hua University.
- Cohen, (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). New York, NY: Lawrence Erlbaum.
- Cohen, A. D. (1998). *Strategies in learning and using a second language*. Harlow: Longman.
- Cohen, A. D. (2003). The learner's side of foreign language learning: Where do styles, strategies, and tasks meet? *IRAL*, 41, 279-291.
- Collins online dictionary. Definition of literacy retrieved on January 20, 2012, <http://www.collinsdictionary.com/dictionary/english/literacy>
- Conley, A. M. (2007). *Patterns and pathways: A person-oriented approach to understanding students' motivation to learn*. Unpublished doctoral dissertation. Ann Arbor, MI: University of Michigan.
- Csizér, K., & Dörnyei, Z. (2005). The internal structure of language learning motivation and its relationship with language choice and learning effort. *The Modern Language Journal*, 89, 19-36.

- Csizér, K., & Kormos, J. (2009). Learning experiences, selves and motivated learning behaviour: A comparative analysis of structural models of Hungarian secondary and university learners of English. In Z. Dörnyei & E. Ushioda (Eds.), *Motivation, language identity and the L2 self* (pp. 98–119). Bristol: Multilingual Matters.
- Cummings, A. (1989). Writing expertise and second language proficiency. *Language Learning*, 39(1), 81-141.
- Cumming, A. (2001). Learning to write in a second language: two decades of research. *International Journal of English Studies*, 1(2), 1-23.
- Cumming, A., Busch, M., & Zhou, A. (2002). Investigating learners' goals in the context of adult second-language writing. In S. Ransdell & M Barbier (Eds.) *New directions for research in L2 writing* (pp. 189-208). Dordrecht, Netherlands: Kluwer.
- Curry, M. & Lilis, T. (2004). Multilingual scholars and the imperative to publish in English: Negotiating interests, demands, and rewards. *TESOL Quarterly*, 38(4), 663-688.
- Deci, E. L. & Ryan, R. M. (1985). Information-Processing Theories. *Intrinsic motivation and self-determination in human behavior* (Chapter 8, pp. 213-242). New York: Plenum.
- Diamantopoulos, A., & Siguaw, J. A. (2000), *Introducing LISREL*. London: Sage Publications.
- Dörnyei, Z. (2001). *Teaching and researching motivation*. Harlow, U.K.: Pearson Education.
- Dörnyei, Z. (2002). The motivational basis of language learning tasks. In P. Robinson, (Ed.) *Individual differences and instructed language learning*. (pp137-158). John Benjamins, Amsterdam.
- Dörnyei, Z. (2005). Motivation and 'self-motivation.' Language learning strategies and student self-regulation. *The psychology of the language learner* (Chapter4, pp 65-118. Chapter 5, pp.120-161). Mahwah, NJ: Lawrence Erlbaum Associates.
- Dörnyei, Z.,Csizér, K., & Nemeth, N. (2006). *Motivation Language Attitudes and Globalization: A Hungarian Perspective*. Clevedon: Multilingual matters.
- Dörnyei, Z. (2009). The L2 motivational self system. In Z. Dörnyei & E. Ushioda (Eds.), *Motivation, language identity and the L2 self* (pp. 9-42). Bristol, UK:

Multilingual Matters.

- Dörnyei, Z., & Csizér, K. (2002). Some dynamics of language attitudes and motivation: Results of a longitudinal nationwide survey. *Applied Linguistics*, 23(4), 421–462.
- Dos Santos., B. M., (1996). The textual organization of research article abstracts in applied linguistics. *Text*, 16(4), 481-500.
- Eccles (Parsons), J., Adler, T. F., Futterman, R., Goff, S. B., Kaczala, C. M., Meece, J. L., & Midgley, C. (1983). Expectancies, values, and academic behaviors. In J. T. Spence (Eds.), *Achievement and achievement motivation* (pp. 75-146). San Francisco: W. H. Freeman.
- Eccles, J. S., & Wigfield, A. (1995). In the mind of the achiever: The structural of adolescents academic achievement related beliefs and self-perceptions. *Personality and Social Psychology Bulletin*, 21, 215-225.
- Eccles, J. S., & Wigfield, A. (2002). Motivational beliefs, values, and goals. *Annual Review of Psychology*, 53, 109-132.
- Eccles, J. S. (2009). Who am I and What am I going to do with my life? Personal and collective identities as motivators of action. *Educational Psychologist*, 44(2), 78-89.
- Eccles, J. S., & Roeser, R. W. (2009). Schools, academic motivation, and stage-environment fit. In R. M. Lerner, & L. Steinberg. (Eds.), *Handbook Adolescent Psychology: Individual bases of adolescent development* (3rd ed., Vol. 1, pp.404-434). Hoboken : NJ: John Wiley & Sons.
- Elliot, A. J., & McGregor, H. A. (1999). Test anxiety and the hierarchical model of approach and avoidance achievement motivation. *Journal of Personality and Social Psychology*, 76, 628–644.
- Farrell, A. (2010). Insufficient discriminant validity: A comment on Bove, Pervan, Beatty, and Shiu (2009). *Journal of Business Research*, 63, 234-237.
- Feng, H. P. (2001). *Writing an Academic Paper in English: An Exploratory Study of six Taiwanese Graduate Students*. Unpublished doctoral dissertation, Columbia University, New York.
- Flower, L., & Hayes, J. (1977). Problem-solving strategies and the writing process. *College English*, 39, 449-461.
- Flower, L., & Hayes, J. (1980a). The cognition of discovery: Defining a rhetorical

- problem. *College Composition and Communication*, 40, 282-311.
- Flower, L., & Hayes, J. (1980b). The dynamics of composing: Making plans and juggling constraints. In L. Gregg & E. Steinberg (Eds.), *Cognitive process in writing*, (pp. 39-58). Hove, Sussex and Hillsdale, NJ: L. Erlbaum.
- Flowerdew, J. (1999a). Writing for scholarly publication in English: the case of Hong Kong. *Journal of Second Language Writing*, 8(2), 123-145.
- Flowerdew, J. (1999b). Problems in writing for scholarly publication in English: the case of Hong Kong. *Journal of Second Language Writing*, 8(3), 243-264.
- Flowerdew, J. (2000). Discourse community, legitimate peripheral participation, and the nonnative-English speaking scholar. *TESOL Quarterly*, 34(1), 127-150.
- Flowerdew, J. (2011) Action, content and identity in applied genre analysis for ESP. *Language Teaching*, 44(4), 516–528.
- Fornell C, Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39–50.
- Gagne, T. Mikail, S., & D'Eon, J. (1995). Confirmatory factor analysis of a 4-factor model of chronic pain evaluation. *Pain*, 60, 195-202.
- Gardner, R. C. (1985). *Social Psychology and Second Language learning: The Role of Attitudes and Motivation*. London: Edward Arnold.
- Gardner, R. C. (2001). Integrative motivation and second language acquisition. In Z. Dörnyei, & R. Schmidt (Eds.), *Motivation and second language acquisition (pp 1-20)*. University of Hawaii.
- Gardner, R. C. (2004). *Attitude/motivation test battery: International AMTB research project*. Retrieved December 12, 2010, from: <http://publish.uwo.ca/~gardner/docs/englishamtb.pdf>
- Gardner, R. C., P. Tremblay, P. & Masgoret, A. M. (1997). Towards a full model of second language learning: an empirical investigation. *The Modern Language Journal*, 81(3), 344-362.
- Gardner, R. C. Masgoret, A. M., Tennant, J., & Mihic, L. (2004). Integrative motivation: changes during a year-long intermediate-level language course. *Language Learning*, 54(1), 1-34.
- Gardner, R. C. (2007). Motivation and Second Language Acquisition. *Porta Linguarum*, 8, 9-20.

General English Proficiency Test (2002). Technical report on the GEPT-advanced.

Retrieved February 15, 2012, from:

<http://www.lttc.ntu.edu.tw/research/ad/AdvReport.pdf>

- Gosden, H. (1995). Success in research article writing and revision: A social-constructionist perspective. *English for Specific Purposes*, 14(1), 37-57.
- Gosden, H. (1996). Verbal reports of Japanese novices' research writing practices in English. *Journal of Second Language Writing*, 5, 109-128.
- Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (1998). *Multivariate data analysis* (5th ed.). New Jersey: Prentice-Hall.
- Hair, J. F., Black, W.C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2010). *Multivariate Data Analysis* (7th ed.). Upper Saddle River: NJ: Prentice Hall.
- Hancioglu, N. (2009). *Incorporation corpus data into an advanced academic thesis writing course*. Unpublished doctoral dissertation, Eastern Mediterranean University.
- He, T. H. (2005). Effects of mastery and performance goals on the composition strategy use of adult EFL writers. *The Canadian Modern Language Review*, 61(3), 407-431.
- He, T. H., Chang, S. M., Chen, S. H. E., & Gou, W. J. (2012). Trichotomous goals of elementary school students learning English as a foreign language: A structural equation model. *Perceptual and Motor Skills*, 114(2), 157-173.
- Hooper, D., Coughlan, J., & Mullen, M. R. (2008) "Structural Equation Modelling: Guidelines for Determining Model Fit." *The Electronic Journal of Business Research Methods*, 6(1), 53 – 60. Available online at www.ejbrm.com
- Howell, A., & Watson, D. (2007). Procrastination: Associations with achievement goal orientation and learning strategies. *Personality and Individual Differences*, 43, 167-178.
- Hsieh, W. M., Liou, H. C. (2008). A case study of corpus-informed online academic writing for EFL graduate students. *CALICO Journal*, 26(1), 28-47.
- Huang, S. C. (2007). A review of L2 learning motivation theories and studies. *English Teaching & Learning*, 31(3), 101-124.
- Huang, J. C. (2010). Publishing and learning writing for publication in English: Perspectives of NNES PhD students in science. *Journal of English for Academic Purposes*, 9, 33-44.

- Huckin, T. N. (2001). Abstracting from abstracts. In M., Hewings (ed.) *Academic writing in context* (pp. 93-103) Birmingham: University of Birmingham Press.
- Husman, J., Derryberry, W. P., Crowson, H. M., & Lomax, R. (2004). Instrumentality, task value, and intrinsic motivation: Making sense of their independent interdependence. *Contemporary Educational Psychology, 29*, 63-76.
- Hyland, K. (2000). *Disciplinary discourse: Social interactions in academic writing*. London: Longman.
- Hyland, K. (2003). Genre-based pedagogies: A social response to process. *Journal of second language writing, 12*, 17-29.
- Hughey, J. B., Wormuth, V., Hartfiel, F., & Jacobs, H. L. (1983). *Teaching ESL composition: Principles and techniques*. Rowley, Massachusetts: Newbury House Publishers, Inc.
- Jöreskog, K. & Sörbom, D. (1996). *LISREL 8: User's reference guide*. Chicago, IL: Scientific Software International, Inc.
- Jones, E. (2008). Predicting performance in first-semester college basic writers: Revisiting the role of self-beliefs. *Contemporary Educational Psychology, 33*, 209-238.
- Jonsson, A. & Svingby G. (2007). The use of scoring rubrics: Reliability, validity, and educational consequences. *Educational Research Review, 2*, 130-144.
- Jussim, L. (1989). Teacher expectations: Self-fulfilling prophecies, perceptual biases, and accuracy. *Journal of Personality and Social Psychology, 57*, 469-480.
- Jussim, L. & Eccles, J. (1992). Teacher expectations II: Construction and reflection of student achievement. *Journal of Personality and Social Psychology, 63*(6), 947-961.
- Kent, T. (Eds.). (1999). *Post-process theory: Beyond the writing-process paradigm*. Carbondale: Southern Illinois University Press.
- Khaldieh, S. A. (2000). Learning strategies and writing processes of proficient vs. less-proficient learners of Arabic. *Foreign Language Annals, 33*(5), 522-534.
- Kline, R. B. (2011). *Principles and practices of structural equation modeling* (3rd ed.). New York, NY: Guilford.
- Knoch, U. (2010). Diagnostic assessment of writing: A comparison of two rating scales. *Language Testing, 26* (2), 275-304.
- Kormos, J., & Csizér, K. (2008) Age-related differences in the motivation of learning

- English as a foreign language: Attitudes, selves and motivated learning behavior. *Language Learning*, 58 (2), 327-355.
- Kyttälä, M & Björn, P (2010). Prior mathematics achievement, cognitive appraisals and anxiety as predictors of Finnish students' later mathematics performance and career orientation. *Educational Psychology*, 30(4), 431-448.
- Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics*, 33, 159-174.
- Larios, J. R., Manchon, R., Murphy, L., & Marin, J. (2008). The foreign language writer's strategic behavior in the allocation of time to writing process. *Journal of Second Language Writing*, 17, 30–47.
- Lau, H. H. (2004). The structure of academic journal abstracts written by Taiwanese PhD students. *Taiwan Journal of TESOL*, 1 (1), 1-25.
- Lea, M. (2008). Academic literacies in theory and practice. In B.V. Street, & N. H. Hornberger (Eds.), *Encyclopeida of language education* (2nd edition) Volume 2: Literacy (pp. 227-238). New York: Springer.
- Lee, S. Y. (2005). Facilitating and inhibiting factors on EFL writing: A model testing with SEM. *Language Learning*, 55(2), 335-374.
- Leki, I. (1995). Coping strategies of ESL students in writing tasks across the curriculum. *TESOL Quarterly*, 29, 235-260.
- Lenzner, A., & Dickhäuser, O. (2009). Kann der Lernerfolg in der Ausbildung durch den Einsatz bestimmter Motivationsregulationsstrategien vorhergesagt werden? Eine Fragebogenstudie [Can learning success in vocational education be predicted by using particular motivational regulation strategies? A survey study]. Poster presented at the 12th conference of the section educational psychology of the German Association for Psychology (DGPs), Saarbrücken, Deutschland.
- Liem, A.D., Lau, S., & Nie, Y. (2008). The role of self-efficacy, task value, and achievement goals in predicting learning strategies, task disengagement, peer relationship, and achievement outcome. *Contemporary Educational Psychology*, 33(4), 486-512.
- Liou, H. C., Yang, P. C., & Chang, J. S. (2011). Language supports for journal abstract writing across disciplines. *Journal of Computer Assisted Learning*. doi: 10.1111/j.1365-2729.2011.00446.x

- Lu, Y. (2010). *Cognitive Factors Contributing to Chinese EFL Learners' L2 Writing Performance in Timed Essay Writing*. Unpublished doctoral thesis, Georgia State University.
- Luttrell, V., Callen, B., Allen, C., Wood, M., Deeds, D., & Richard, D. (2010). The mathematics value inventory for general education students: Development and initial validation. *Educational and Psychological Measurement, 70* (1), 142-160.
- MacIntyre, P. D. (2002). Motivation, anxiety, and emotion in second language acquisition. In P. Robinson, (Eds.), *Individual differences and instructed language learning*. (pp 45-68). John Benjamins, Amsterdam.
- Manchon, R. M. (2001). Trends in the conceptualization of second language composing strategies: A critical analysis. *International Journal of English Studies, 1*(2), 47-70.
- Manchon, R. M. (2007). Language learning and language use strategies. The research and its implications for instructed language learning. In E. Uso, and N. Ruiz-Madrid (eds.): *Pedagogical reflections on reaching and learning modern languages*. Castello, Spain: Publications de la Universitat Jaume I.
- Manchon, Larios, & Murphy, (2007). Lexical retrieval process and strategies in second language writing: A synthesis of empirical research. *International Journal of English Studies, 7*(2), 149-174.
- Manchon, R. M. (2008). Taking strategies to the foreign language classroom: Where are we now in theory and research? *IRAL, 46*, 221-243.
- Manchon, R. M., Murphy, L. & Roca de Larios, J. (2000). An approximation to the study of backtracking in L2 writing. *Learning and Instruction, 10*, 13-25.
- Masgoret, A. M., & Gardner, R. C. (2003). Attitudes, motivation, and second language learning: A meta-analysis of studies conducted by Gardner and associates. *Language Learning, 53*, 167-210.
- Matthews, P. H. (2008). Achievement motivational characteristics of University foreign language learners: From the classroom to the tutoring table. *Foreign Language Annals, 41*(4), 611-626.
- McComiskey, B. (2000). *Teaching composition as a social process*. Logan, UT: Utah State University Press.
- Middleton, M. J., & Midgley, C. (1997). Avoiding the demonstration of lack of ability: An underexplored aspect of goal theory. *Journal of Educational Psychology, 89*, 710-718.

- Miller, R., Greene, B., Montalvo, G., Ravindran, B., & Nichols, J. (1996). Engagement in academic work: The role of learning goals, future consequences, pleasing others, and perceived ability. *Contemporary educational psychology, 21*, 388-422.
- Mori, S. (2002). Redefining motivation to read in a foreign language. *Reading in a Foreign Language, 14*(2), 91-110.
- Mori, S., & Gobel, P. (2006). Motivation and gender in Japanese EFL classroom. *System, 34*(2), 194-210.
- Morita, N. & Kobayashi, M. (2008). Academic discourse socialization in a second language (Eds.), *Encyclopedia of language education* (2nd edition) Volume 2, Volume 8: Language Socialization (pp. 243-255). New York: Springer.
- Okamura, A. (2006). Two types of strategies used by Japanese scientists, when writing research articles in English. *System, 34*, 68-79.
- Olsen, S. (1999). Errors and compensatory strategies: A study of grammar and vocabulary in texts written by Norwegian learners of English. *System, 27*, 191-205.
- O'Malley, J. & Chamot, A. J. (1990). *Learning strategies in second language acquisition*. Cambridge: Cambridge University Press.
- Online material 1: *Task analytic rubric for a research article*. Retrieved December 20, 2011, from Instructional Assessment Resources Website: <http://www.utexas.edu/academic/ctl/assessment/iar/students/report/rubrics-research.php>.
- Online material 2: *Rubric for the Final Paper*. Retrieved January 20, 2012, from: http://myedison.tesc.edu/tescdocs/Web_Courses/LDR-305-OL/Rubrics/rubric_finalpaper.htm.
- Online material 3: *Scoring Rubric for COS 301 Technical Writing*. Retrieved January 20, 2012, from UMaine Computer Science Website: <http://umcs.maine.edu/~cmeadow/courses/cos301/COS301-writing-rubric.pdf>.
- Oxford, R. L. (1990). Strategy inventory for language learning. In Oxford, R. L. (ed.), *Language learning strategies: What every teacher should know* (pp. 283-300). Boston: Heinle & Heinle.
- Oxford, R. & Shearin, J. (1994). Language learning motivation: Expanding the

- theoretical framework. *Modern Language Journal*, 78, 12-28.
- Oxford, R. L. (2011). *Teaching & researching: Language learning strategies*. Harlow, UK: Pearson Education Limited.
- Oyserman, D., Terry, K., & Bybee, D. (2002). A possible selves intervention to enhance school involvement. *Journal of Adolescence*, 25, 313-326.
- Oyserman, D., Bybee, D., Terry, K., & Hart-Johnson, T. (2004). Possible selves as roadmaps. *Journal of Research in Personality*, 38, 130-149.
- Oyserman, D., Bybee, D., & Terry, K. (2006). Possible selves and academic outcomes: How and when possible selves impel action. *Journal of Personality and Social Psychology*, 91(1), 188-204.
- Oyserman, D., & Destin, M. (2010). Identity-based motivation: Implications for intervention. *The Counseling Psychologist*, 38 (7), 1001-1043.
- Petrić. B. & Czarl, B. (2003). Validating a writing strategy questionnaire. *System*, 31, 187-215.
- Pfingstag, N. (1984). Showing writing: Modeling the process. *TESOL Newsletter*, 18, 1-3.
- Pho, P., (2008). Research article abstracts in applied linguistics and educational technology: A study of linguistic realizations of rhetorical structure and authorial stance. *Discourse Studies*, 10(2), 231-250.
- Pintrich, P. R., & De Groot E. (1990). Motivational and self-regulated learning components of classroom academic performance. *Journal of Educational Psychology*, 82 (1), 33-50.
- Pintrich, R., Smith, D., Garcia, T., & Makeachie, W. (1991). *A Manual for the use of the motivated strategies for learning questionnaire (MSLQ)*. Ann Arbor, Michigan: The University of Michigan.
- Pintrich, P. R. (1999). The role of motivation in promoting and sustaining self-regulated learning. *International Journal of Educational Research*, 31, 459-470.
- Pintrich, P. R. and Zusho, A. (2002): Student motivation and self-regulated learning in the college classroom, In J. C. Smart & W.G. Tierney (Eds) *Higher education: handbook of theory and research* (vol. XVII). New York. NY: Agathon Press.
- Pintrich, P. R. (2000). The role of goal orientation self-regulated learning. M. Boekaerts, P. R., Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (Chapter 14, pp 451-502). San Diego, CA: Academic Press.

- Pintrich, P. R. (2004). A conceptual framework for assessing motivation and self-regulated learning in college students. *Educational Psychology Review*, 16(4), 385-407.
- Pokay, P., Blumenfeld, P. C. (1990). Predicting Achievement Early and Late in the Semester: The Role of Motivation and Use of Learning Strategies. *Journal of Educational Psychology*, 84(1), 41-50.
- Raimes, A. (1985). What unskilled ESL students do as they write: A classroom study of composing. *TESOL Quarterly*, 19, 229-255.
- Raimes, A. (1987). Language proficiency, writing ability, and composing strategies: A study of ESL college student writers. *Language Learning*, 37, 439-467.
- Randolph, J. J. (2005). Free-marginal multirater kappa: An alternative to Fleiss' fixed-marginal multirater kappa. Paper presented at the Joensuu University Learning and Instruction Symposium 2005, Joensuu, Finland, October 14-15th, 2005. (ERIC Document Reproduction Service No. ED490661)
- Randolph, J. J. (2008). *Online Kappa Calculator*. Retrieved May 31, 2012, from <http://justus.randolph.name/kappa>.
- Salager-Meyer, F. (1992). A text-type and move analysis study of verb tense and modality distribution in medical English abstracts. *English for Specific Purposes*, 11, 93-113.
- Sasaki, M. and Hirose, K. (1996). Explanatory variables for EFL students' expository writing. *Language Learning*, 46, 137-168.
- Sasaki, M. (2000). Toward an empirical model of ESL writing processes: An Exploratory Study. *Journal of Second Language Writing*, 9 (3), 259-291
- Sasaki, M. (2004). A multiple-data analysis of the 3.5 year development of EFL student writers. *Language Learning*, 54, 525-582.
- Sasaki, M. (2011). Effects of varying lengths of study-abroad experiences on Japanese EFL students' L2 writing ability and motivation: A longitudinal study. *TESOL Quarterly*, 45, 81-105.
- Scardamalia, M & Bereiter, C. (1986). Research on written composition. In C. Wittrock (Ed.). *Handbook of research on teaching* (pp. 778-803). New York: MacMillan Education Ltd.
- Schoonen, R., Van Gelderen, A., De Glopper, K., Hulstijn, J., Simis, A., Snellings, P., & Stevenson, M. (2003). First language and second language writing: The role of linguistic knowledge, speed of processing and metacognitive knowledge.

- Language Learning*, 53(1), 165-202.
- Schreiber, J. B., Nora, A., Stage, F. K., Barlow, E. A., & King, J. (2006). Reporting structural equation modeling and confirmatory factor analysis results: A review. *Journal of Educational Research*, 99, 323-337.
- Schunk, D. H., Pintrich, P. R., & Meece, J. L. (2008). *Motivation in education: Theory, research, and applications* (3rd ed.). Upper Saddle River, NJ: Pearson Education.
- Schwinger, M., Steinmayr, R., & Spinath, B. (2009). How do motivational regulation strategies affect achievement: Mediated by effort management and moderated by intelligence. *Learning and Individual Differences*, 19, 621-627.
- Schwinger, M., Steinmayr, R., & Spinath, B. (2012) (in press). Not all roads lead to Rome- Comparing different types of motivational regulation profiles. *Learning and Individual Differences* doi:10.1016/j.lindif.2011.12.006.
- Shaw, P. (1991). Science research students' composing processes. *English for Specific Purposes*, 10, 189-206.
- Steel, P. (2007). The Nature of Procrastination: A Meta-Analytic and Theoretical Review of Quintessential Self-Regulatory Failure. *Psychological Bulletin*, 133(1), 65-94.
- Stoller, F., Horn B., Grabe, W. , & Robinson, M. (2005) Creating and validating assessment instruments for a discipline-specific writing course: An interdisciplinary approach. *Journal of Applied Linguistics*, 2(1), 75-104.
- Swales, J. M. (1990). *Genre analysis: English in academic and research settings*. Cambridge, UK: Cambridge University Press.
- Swales, J. (2004). *Research genres: Explorations and applications*. Cambridge: Cambridge University Press.
- Swales, J., & Feak, C. (2004). *Academic writing for graduate students: Essential tasks and skills*. (2nd ed). Ann Arbor, MI: University of Michigan Press.
- Swales, J., & Feak, C. (2009). *Abstracts and the writing of abstracts*. Ann Arbor, MI: University of Michigan Press.
- Swales, J., & Feak, C. (2010). From text to task: Putting research on abstracts to work. In M. F., Garrido, J.C., Palmer-Silveira, & I. Fortanet-Gomez. *English for professional and academic purposes* (pp 167-180). New York, NY: Amsterdam.

- Swalander, L., Taube, K. (2007). Influences of family based prerequisites, reading attitude, and self-regulation on reading ability. *Contemporary Educational Psychology*, 32, 206-230.
- Tabachnick, B. G., and Fidell, L. S. (2007). *Using multivariate statistics* (5th Edition). Boston: Allyn and Bacon.
- Tremblay, P. F., Goldberg, M. P., & Gardner, R. C. (1995). Trait and state motivation and the acquisition of Hebrew vocabulary. *Canadian Journal of Behavioral Science*, 27, 356-370.
- Tseng, W. T., Dörnyei, Z., & Schmitt, N. (2006). A new approach to assessing strategic learning: The case of self-regulation in vocabulary acquisition. *Applied Linguistics*, 27, 78-102.
- Tseng, W. T. & Schmitt, N. (2008). Toward a model of motivated vocabulary learning: A structural equation modeling approach. *Language Learning*, 58(2), 357-400.
- Urdu, T. C. (2004). Predictors of academic self-handicapping and achievement: Examining achievement goals, classroom goal structures, and culture. *Journal of Educational Psychology*, 96, 251–264.
- Vanderstoep, S. W., Pintrich, P. R. (2003). *Learning to learn: The skill and will of college success*. Upper Saddle River, NJ: Prentice Hall.
- Warrens, M. J. (2010). Inequalities between multi-rater kappas. *Advances in data analysis and classification*. Advanced online publication. doi:10.1007/s11634-010-0073-4.
- Weinstein, C., Husman, J., Dierking, D. (2000). Self-regulation interventions with a focus on learning strategies. M. Boekaerts, P. R., Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (Chapter 22, pp 728-744). San Diego, CA: Academic Press.
- Whalen, K., & Menard, N. (1995). L1 and L2 writers' strategic and linguistic knowledge: A model of multiple-level discourse processing. *Language Learning*, 45(3), 381-418.
- Wheaton, B., Muthen, B., Alwin, D., F., and Summers, G. (1977), "Assessing Reliability and Stability in Panel Models," *Sociological Methodology*, 8 (1), 84-136.
- Wigfield, A., Eccles, J. S. (2002). The development of competent beliefs, expectations for success, and achievement values from childhood through adolescence. In A. Wigfield & J. S. Eccles (Eds.), *Development of achievement motivation* (pp.

- 92-120). San Diego: Academic Press.
- Wigfield, A., Eccles, J. S., Schiefele, U., Roeser, R., & Davis-Kean P. (2006). Motivation. In N. Eisenberg (Ed.), *Handbook of child psychology: Vol 3. Social, emotional, and personality development* (6th ed., pp 933-1002). New York: Wiley.
- Wolters, C. A. (1998). Self-regulated learning and college students' regulation of motivation. *Journal of Educational Psychology, 90*, 224–235.
- Wolters, C. A. (1999). The relation between high school students' motivational regulation and their use of learning strategies, effort, and classroom performance. *Learning and Individual Differences, 11*, 281–299.
- Wolters, C. (2003). Understanding procrastination from a self-regulated learning perspective. *Journal of Educational Psychology, 95*, 179-187.
- Wolters, C.A. (2003). Regulation of motivation: evaluating an underemphasized aspect of self-regulated learning. *Educational Psychologist, 38*, 189-205.
- Wolters, C.A., Pintrich, P. R., and Karabenick, S.A. (2003) *Assessing academic self-regulated learning*. Paper presented at the conference on Indicators of Positive Development: Definitions, Measures, and Prospective Validity, Washington, D.C.
- Wolters, C.A. (2011). Regulation of motivation: Contextual and social aspects. *Teachers. College Record, 113*(2), 265-283.
- Wolters, C., Fan, W., Daugherty, S. (2011). Teacher reported goal structures: Assessing factor structure and invariance. *Journal of Experimental Education, 79*, 1 – 29.
- Wu, J. (2012). GEPT and English Language Teaching and Testing in Taiwan. *Language Assessment Quarterly, 9*(1), 11-25.
- Yang, H. C. & Plakans, L. (2012). Second language writers' strategy use and performance on an integrated reading-listening-writing task. *TESOL Quarterly, 46*(1), 80-103.
- Yang, H. C. (2012). Modeling the relationships between test-taking strategies and test performance on a graph-writing task: Implications for EAP. *English for Specific Purposes* (in press), doi:10.1016/j.esp.2011.12.004.
- Yashima, T. (2002). Willingness to communicate in a second language: The Japanese EFL context. *The Modern Language Journal, 86*, 54–66.
- Yashima, T., Zenuk-Nishide, L. & Shimizu, K. (2004). The influence of attitudes and

- affect on willingness to communicate and second language communication. *Language Learning*, 54(1), 119-152.
- Yen, T. Y. (2007). *Writing anxiety and writing strategy use among Taiwanese English majors*. Unpublished master's thesis, National Taiwan Normal University.
- Yun, Y. (2005). *Factors explaining EFL learners' performance in a timed essay writing test: A structural equation modeling approach*. Unpublished doctoral dissertation, University of Illinois at Urbana-Champaign, Urbana, Illinois.
- Zare-ee, A. (2011). Does English proficiency level predict writing speed, length, and quality? *Arab World English Journal*, 2(3), 128-140.
- Zamel, V. (1982). Writing: The process of discovering meaning. *TESOL Quarterly*, 16, 195-209.
- Zamel, V. (1983). The composing processes of advanced ESL students: Six case studies. *TESOL Quarterly*, 17, 165-187.
- Zhu, W. (2004). Faculty views on the importance of writing, the nature of academic writing, and teaching and responding to writing in the disciplines. *Journal of Second Language Writing*, 13, 29-48.
- Zimmerman, B. (2000). Attaining self-regulation: A social cognitive perspective. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation: Theory, research, and applications* (pp. 13-29). San Diego: Academic Press.
- Zimmerman, B. J. (2008). Investigating Self-Regulation and Motivation: Historical Background, Methodological Developments, and Future Prospects. *American Educational Research Journal*, 45 (1), 166-183.

Appendices

Appendix A: Demographics questionnaire, IWMI, and SWSI

姓名（請務必填寫）：_____ 學校（請務必填寫）：_____

系所（請務必填寫）：_____ 組別（請務必填寫）：_____

親愛的同學：

本研究旨在瞭解台灣研究生之英文學術論文寫作動機、學術論文摘要寫作策略，對其寫作能力的影響。透過您的參與和協助，將有助於學界瞭解寫作動機與寫作策略在寫作中所扮演的角色。以下三份問卷僅供學術研究參考，絕不對外公開您的相關資料！因此請依照實際情形作答！謝謝您的配合！

敬祝 學安順心

台灣師範大學英語系英語教學所 博士候選人林明佳（allylin33@gmail.com; 896210053@ntnu.edu.tw）

指導老師：程玉秀教授與林世華教授

1. 個人學習背景問卷

(1) 您的最高學歷為 (請務必填寫)：

碩士生(_____年級_____肄業_____畢業) 博士生(_____年級_____肄業_____畢業)

(2) 您學習英文的年數為：_____年；您學習英文寫作的年數為：_____年

(3) 您學習英文論文寫作(research articles)的年數為：_____年

(4) 您寫過幾篇英文論文摘要 (English abstracts of research articles)？其類型為何？

a) 期末報告論文摘要： 0篇 1-3篇 4-6篇 7-9篇 b) 期刊論文摘要： 0篇 1-3篇 4-6篇 7-9篇

c) 研討會論文： 0篇 1-3篇 4-6篇 7-9篇 d) 學位論文摘要： 0篇 1-3篇 4-6篇

e) 其它類型論文： 0篇 1-3篇 4-6篇

(5) 您每週閱讀英文幾篇英文論文摘要 (English abstracts of research articles)？其類型為何？

a) 期末報告論文摘要： 0篇 1-3篇 4-6篇 7-9篇 b) 期刊論文摘要： 0篇 1-3篇 4-6篇 7-9篇

c) 研討會論文： 0篇 1-3篇 4-6篇 7-9篇 d) 學位論文摘要： 0篇 1-3篇 4-6篇 7-9篇

e) 其它類型論文： 0篇 1-3篇 4-6篇

(6) 您認為學習英文論文寫作，整體而言是困難的：

非常不同意 不同意 中立 同意 非常同意

(7) 您認為學習英文論文摘要寫作是困難的：

非常不同意 不同意 中立 同意 非常同意

(8) 對英文論文摘要的寫作目的，您的瞭解程度為：

非常不瞭解 不瞭解 尚可 瞭解 非常瞭解

(9) 對英文論文摘要的基本組織結構，您的瞭解程度為：

非常不瞭解 不瞭解 尚可 瞭解 非常瞭解

(10) 對英文論文摘要的常用字和文法結構，您的瞭解程度為：

非常不瞭解 不瞭解 尚可 瞭解 非常瞭解

(11) 對英文論文摘要所應包含的內容 (譬如：背景文獻、研究目的、方法、與應用等)，

您的瞭解程度為：

非常不瞭解 不瞭解 尚可 瞭解 非常瞭解

2. 英文學術論文寫作動機問卷

以下這份問卷，針對英文論文(English research articles) 的寫作動機設計而成。請依照您的寫作動機，圈選一個最貼近的答案。作答請依照五分量表：

非常不同意(1)；不同意(2)；中立(3)；同意(4)；非常同意(5)。

非常
不同
中立
同意
非常
同意

12. 我覺得英文學術論文寫作很有趣。

1 2 3 4 5

13. 有能力寫英文學術論文將對我有助益。

1 2 3 4 5

14. 寫英文學術論文令我感到興奮。

1 2 3 4 5

15. 寫英文學術論文對我以後的人生很有用。

1 2 3 4 5

| | |
|---|-----------------------------|
| 16.我著迷於撰寫英文學術論文。 | 1 2 3 4 5 |
| 17.英文學術論文的寫作技巧很寶貴，因為這些技巧對我的未來有幫助。 | 1 2 3 4 5 |
| 18.我很享受寫英文學術論文。 | 1 2 3 4 5 |
| 19.當我要找工作或是再深造時，擅長撰寫英文學術論文是很重要的。 | 1 2 3 4 5 |
| 20.寫英文學術論文對我有很大的吸引力。 | 1 2 3 4 5 |
| 21.我理解有能力寫英文學術論文的意義所在。 | 1 2 3 4 5 |
| 22.為了寫出好的英文學術論文，我必須放棄很多事情。 | 1 2 3 4 5 |
| 23.擅長寫英文學術論文對我很重要，因為這會讓我更自在地與我的學術領域成員相處，這些成員都能讀、寫英文論文。 | 1 2 3 4 5 |
| 24.英文學術論文寫作上的成就需要我放棄其他自己喜歡的活動。 | 1 2 3 4 5 |
| 25.擅長寫英文學術論文對我很重要，因為這會讓我與自己的學術領域中不同的成員有所連結。 | 1 2 3 4 5 |
| 26.寫英文學術論文帶給我巨大的壓力。 | 1 2 3 4 5 |
| 27.擅長寫英文學術論文對我很重要，因為這會展現我對自己領域學科文化的熟悉度。 | 1 2 3 4 5 |
| 28.我需要極努力才能成功撰寫英文學術論文。 | 1 2 3 4 5 |
| 29.擅長寫英文學術論文對我很重要，因為這會增加我參與自己學科社群活動的機會（譬如：口頭發表會議論文，出版會議論文集或期刊論文）。 | 1 2 3 4 5 |
| 30.寫英文學術論文讓我很焦慮。 | 1 2 3 4 5 |
| 31.擅長寫英文學術論文對我很重要，因為這會讓我在自己的學科社群中，取得社會威望。 | 1 2 3 4 5 |
| 以下的英文論文寫作動機題項，請以另一個五分量表作答： 非常沒信心(1)；沒信心(2)；還好(3)；有信心(4)；非常有信心(5) 。作答時，請依據您對各題所述事項之自信程度，圈選一個最貼近的答案。 | 非常沒信心 沒信心 還好 有信心 非常有信心 |
| 32.我可以學會每件關於英文學術論文寫作的事。 | 1 2 3 4 5 |
| 33.如果不放棄的話，我可以成功完成英文學術論文寫作。 | 1 2 3 4 5 |
| 34.我很擅長寫英文學術論文。 | 1 2 3 4 5 |
| 35.寫英文學術論文是我的強項之一。 | 1 2 3 4 5 |
| 36.我可以解決英文學術論文寫作中最困難的問題。 | 1 2 3 4 5 |
| 3. 英文論文摘要的寫作策略問卷 以下這份問卷，針對英文論文摘要 (English abstracts of research articles) 的寫作策略設計而成。請依照您撰寫英文論文摘要的經驗(您寫過的摘要可能包含以下的類型：期末報告論文、期刊論文、研討會論文、學位論文的摘要等)，圈選一個最貼近的答案。作答請依照五分量表： 從不如此(1)；通常不如此(2)；有時是如此(3)；通常是如此(4)；總是如此(5) 。 | 從不如此 通常不如此 有時是如此 通常是如此 總是如此 |
| 37.寫英文論文摘要時，我從自己的整篇學術論文，選出最重要的資訊放入摘要中。(不管是用母語或英語來選擇訊息，或是思考。) | 1 2 3 4 5 |
| 38.寫英文論文摘要時，若不知道怎麼用英文表達自己的想法，我就簡化自己想說的話。 | 1 2 3 4 5 |

| | |
|---|-----------|
| 39.我閱讀已發表的英文摘要（例如期刊論文、書的章節、或是研討會論文集）的句子範例，然後在自己的英文摘要中造類似的句子。 | 1 2 3 4 5 |
| 40.寫英文論文摘要時，如果我不懂一個英文字的使用法，我使用各種有效的用字策略（像是馬上查字典、先寫中文、或是寫簡單的英文），以表達自己的想法。 | 1 2 3 4 5 |
| 41.寫英文論文摘要時，我重讀已完成的部分來想如何往下寫。 | 1 2 3 4 5 |
| 42.我重讀並修改自己的英文論文摘要，以提昇摘要文意的清楚度。 | 1 2 3 4 5 |
| 43.我重讀並修改自己的英文論文摘要，以改善其組織結構。 | 1 2 3 4 5 |
| 44.我重讀並修改自己的英文論文摘要，以提昇摘要中單字文法用法的正確性。 | 1 2 3 4 5 |
| 45.我重讀並修改自己的英文論文摘要，以提昇摘要中單字文法用法的適切性，期能合乎學術英文強調用字簡潔與句型精鍊的傳統。 | 1 2 3 4 5 |
| 46.經由預測讀者可能有的知識、態度，我讓預設的讀者和我的英文論文摘要產生連結。 | 1 2 3 4 5 |
| 47.在我的英文論文摘要中，我會按照學術社群所預期，小心謹慎地呈現論點（像是使用一些謹慎語 may, could, probably, likely, etc，來降低論點的主觀性。） | 1 2 3 4 5 |
| 48.寫英文論文摘要時，我會遵循自己領域對摘要字數設限的慣例。 | 1 2 3 4 5 |
| 49.寫英文論文摘要時，我依據自己學科必備的言步來撰文。（言步是指修辭上的言談步驟，摘要中言步是指 研究背景、目的、方法、結果等的陳述 ）。 | 1 2 3 4 5 |
| 50.寫英文論文摘要時，我讓每個言步的長度符合自己學科領域的傳統。（譬如確定每個言步，也就是 研究背景、目的、方法、結果等的陳述 不會過長，以免佔掉太多篇幅。） | 1 2 3 4 5 |
| 51.在我的英文論文摘要中，我適當地使用過去式與現在式等主要時態（像是研究背景與結論的言步用現在式，研究方法與結果的言步用過去式）。 | 1 2 3 4 5 |
| 52.在我的英文論文摘要中，我充分地強調主要的發現。 | 1 2 3 4 5 |
| 53.在我整篇英文論文摘要中，我會讓讀者能看懂其中的頭置詞或縮寫（譬如 RA 代表 research articles）。 | 1 2 3 4 5 |
| 54.在我的英文論文摘要中，我讓每個言步都含有最重要的訊息（像是最重要的研究背景、最重要的研究結果與應用等）。 | 1 2 3 4 5 |
| 55.我試著把英文論文摘要寫作連結到某件我喜歡做或是我覺得有趣的事情。 | 1 2 3 4 5 |
| 56.在寫英文論文摘要時，我參考自己領域內專家所寫的摘要。 | 1 2 3 4 5 |
| 57.我想出一些情境，在那些情境中有能力寫英文論文摘要對我會幫助。（譬如在研討會口頭發表論文、投上期刊論文等。） | 1 2 3 4 5 |
| 58.我根據英語母語者、指導教授、經驗更老道的作者、或是審稿者所給我的意見回饋，來修改我的英文論文摘要。 | 1 2 3 4 5 |
| 59.在寫英文論文摘要時，我不斷告訴自己要做得比別人更好。 | 1 2 3 4 5 |
| 60.我把自己的英文論文摘要放在一旁幾天，然後再以新的角度來審視。 | 1 2 3 4 5 |
| 61.我承諾自己，如果把英文論文摘要寫完的話，將給自己某種獎賞。 | 1 2 3 4 5 |
| 62.當寫英文論文摘要變得困難時，我不會放棄，我也不會只學簡單的部份。 | 1 2 3 4 5 |
| 63.我告訴我自己，如果立刻寫一篇必須完成的英文論文摘要，稍後就可以做自己喜歡的事。 | 1 2 3 4 5 |

| | |
|---|-----------|
| 64.在寫英文論文摘要的不同階段中(像是擬初稿、二稿、定稿時)，我求助英語母語者。 | 1 2 3 4 5 |
| 65.我請經驗老道的作者來檢視我的英文論文摘要。 | 1 2 3 4 5 |
| 66.藉由連結到我一生中想做的事情，我試著讓英文論文摘要寫作變得似乎更有用。 | 1 2 3 4 5 |
| 67.在寫英文論文摘要時，我會查字典(紙本、電子、網路字典/搭配詞、文法字典)。 | 1 2 3 4 5 |
| 68.我告訴自己，至少應該像其他同學一樣努力地寫英文論文摘要。 | 1 2 3 4 5 |
| 69.在寫我的英文學術論文摘要時，我制定一個時間表，以確保我可以即時寫完。 | 1 2 3 4 5 |
| 70.透過比較自己與其他同學在做的事，我讓自己更努力地寫英文論文摘要。 | 1 2 3 4 5 |
| 71.即使寫英文論文摘要是乏味的、無趣的，我仍設法繼續寫完。 | 1 2 3 4 5 |
| 72.我設定自己該達成的英文論文摘要寫作目標，然後承諾自己若能達成該目標，就給自己一個獎賞。 | 1 2 3 4 5 |
| 73.我確保自己規律地學習英文論文摘要的寫作。 | 1 2 3 4 5 |
| 74.即使有可能從事其它活動，我發現自己大多會花充足的時間寫英文論文摘要。 | 1 2 3 4 5 |
| 75.我把自己的英文論文摘要放在不同的格式中(像是 word 檔，網路文件檔，或是紙本)，以利於修改內容或是修改單字文法錯誤。 | 1 2 3 4 5 |

Open-ended questions

1.除了上述的英文論文摘要寫作策略以外，還有哪些寫作策略是您會使用，而沒有被提到的？請寫下您會使用的其他寫作策略。這將協助本研究更深入瞭解台灣研究生之英文摘要的寫作過程！非常謝謝您的完整填答！

2.在填寫以上問卷時，您覺得哪些題目會造成您回答時的困擾？請說明題項及原因。非常謝謝您的全力配合！

<問卷到此結束 非常感謝您的熱心參與及協助! 敬祝 學業進步，研究順心!>

Appendix B: Consent form for the formal study

受試者同意書

背景介紹：本研究為臺灣師範大學英語教學研究所博士生林明佳的博士論文計畫。研究旨在瞭解台灣研究生之英語能力、寫作動機、寫作策略，對其英文學術論文摘要寫作能力的影響。研究對象為英語教學所與應用英語所的研究生，有摘要寫作的經驗，或是學習過程者。透過受試者的參與和協助，將有助於學界瞭解英語能力、動機與策略在英文論文寫作中所扮演的角色。

試驗方法：若您同意參與本研究，您將在 130 分鐘內依序完成三項任務：一份摘要寫作 (60 分鐘)、一份英語讀寫測驗 (55 分鐘)、休息 5 分鐘、填寫三份中文問卷 (背景資料問卷、寫作動機問卷、與寫作策略問卷；共有 75 個題項；填答時間 10 分鐘)。為了略為彌補您參與本研究所花費的時間與體力，您將獲得新台幣 200 元整的受試者費用。待研究完成後，您也將獲得一份簡介記載您的寫作動機與策略、英語讀寫能力與英文論文摘要寫作能力，上述資訊可能可協助您評估自己現階段的英文摘要寫作之學習狀況。

可能導致的副作用：本研究對受試者無顯著的身心副作用。唯實驗流程為 130 分鐘，可能造成受試者體力消耗，而產生身體疲倦感，心理壓力、或焦慮。若您在過程中產生疲憊或負面情緒，可以考慮暫停。

機密性：對您問卷填答結果及英語能力與摘要寫作任務的評量結果，我們將持保密的態度，用代碼取代您的姓名。維護您的隱私。試驗結果即使發表，受試者的身分仍將保密。您決定參加此項計畫是完全自願的，您有不參加的權利。若您對參與研究的相關權益有疑問，您可和研究者林明佳同學聯絡，聯絡方法如下：

電話：0912576033 E-mail：allylin33@gmail.com; 896210053@ntnu.edu.tw

受試者姓名 (正楷) _____ 簽名 _____ 學校 _____

同意書簽署日期 _____ 預定施測日期 _____

聯絡方式 (Email 與手機等) _____

研究者聲明：

我保證我本人或我的研究團隊中的一位成員 (已獲授權進行本步驟的代表)，已經對上述人士解釋過本研究，包括本研究的目的、程序與參加本研究可能的相關副作用和效益。所有被提出之疑問，均已獲得滿意的答覆。

研究者：台灣師範大學英語系英語教學所 博士候選人林明佳

指導教授：程玉秀博士與林世華博士

Appendix C: Consent form for use of the GEPT-advanced.

財團法人語言訓練測驗中心 函

地址：10663 台北市辛亥路二段 170 號

傳真：02-2377-8055

聯絡人：測驗編審組第一科郭曉玲

電話 02-2377-8071 ext. 261

受文者：台灣師範大學英語系研究所林明佳女士

發文日期：中華民國 100 年 11 月 9 日

發文字號：100 測編一字第 0027 號

附件：切結書

主旨：台端來函所提擬使用 LTTC 全民英檢未對外公開之高級閱讀測驗(Part 2)與寫作(第二部份)試題，作為論文「英語讀寫能力、寫作動機、自我調控寫作策略對台灣研究生的英文論文摘要寫作能力之預測性」(The role of L2 literacy, identity-based writing motivation, and self-regulatory writing strategies in predicting research-article abstract writing ability of EFL graduate students)評量工具事宜，本中心原則上同意。

說明：

- 一、請詳閱所附切結書之規範內容，簽名後寄交本中心。
- 二、本次授權 台端使用之試題僅限上述論文之研究，請勿另作他用。
- 三、試題將於本中心收到切結書一周內以加密 PDF 檔方式寄至台端電子郵件信箱(allylin33@gmail.com)，請查收。
- 四、敬請 台端於成果發表前，將研究報告提供本中心參考。

正本：林明佳女士

副本：程玉秀教授

財團法人語言訓練測驗中心

Appendix D: The prompt of RA-abstract writing task

摘要寫作

以下是一篇英語教學的研討會論文，請閱讀此論文，然後依您對摘要應有的形式與內容的瞭解，代替這篇論文的作者，寫出一篇英文論文摘要 (Abstract of research article)。專有名詞或是專業術語的適切性，不列入評量標準中。

注意事項：

- 1)請以 word 檔作答。但寫作期間，請勿使用任何形式的中英文字典或是網路資源。
- 2)摘要的字數限制為 150-200 字，請勿超過此限制。
- 3)作答時間為 60 分鐘。請特別注意時間的分配。

非常謝謝您的參與及配合！

用於本摘要寫作的論文從以下開始：

(本文乃節錄自陳其芬(2006)¹，結合語言學習與反思學習之新機制：非同步討論。第二屆台灣數位學習發展研討會論文集(pp. 429-436)，國立台南大學。

Key words : **Computer assisted language learning (CALL), Asynchronous discussion**

1.

非同步討論現已被廣泛運用於各類課程之網路教學，線上與課室教學並用之混程式教學，以及做為傳統課室教學延伸輔助之用。國內外許多研究報告皆指出非同步討論可使學生藉合作學習方式，利用此種無時間與空間限制之線上討論機制，與其他成員隨時分享、交換、與吸收經驗和知識，提升學習者之思考層次，進而達到主動學習及建構知識、與共同反思成長之教學目的。非同步討論機制之運用，在歐美等國已成為高等教育與成人教育之盛行教學活動，而在台灣現也受到愈來愈多教師與學者之重視與採用。

至於在外語或第二語言教學上，非同步討論在過去經常是應用於一般生活話題的討論活動上，提供學生與母語人士、或與其他第二語言學習者，另一種以外語溝通與表達的機會和管道，進行社交互動[6, 15, 27]。近年來，非同步討論亦被語言教師應用於「以內容為主」(content-based) 外語課程教學中，輔助學生同時學習語言及內容知識，藉此機制讓學生以外語來討論課程內容，增進對內容知識之瞭解與應用，進而發展高層次思考能力。

事實上，由於電腦資訊科技之蓬勃發展，整個語言教學趨勢亦受到極大影響，

¹ Taken from: http://eng-learn.ncu.edu.tw/ShowArticle.asp?CO_no=871&CC_No=4

從過去重視文法翻譯教學、到聽說教學法、再到溝通式教學法，以及到現今強調「以內容為主」教學法並結合社會認知學習理念，電腦資訊科技皆有推波助瀾之效[26]。非同步討論機制運用於語言教學即為一例，它不僅可以讓學生以外語在真實情境中進行有實際目的之溝通，增進語言表達能力，更可使學生藉由意見發表與相互對話，對課程內容知識有更多層面之領悟與反思，進而建立多元思維，增進其分析、批判、整合、與應用等能力。

非同步討論機制雖然理想上可輔助學習者同時學習語言與發展反思能力，但其實際運用成效並無絕對定論，多種因素都有可能影響其成效，例如非同步討論活動及議題之設計，教師如何將其融入教學課程，以及學生如何參與討論共同學習等。若討論活動設計不佳，或小組成員互動品質不良，都有可能降低學生參與非同步討論之意願，如此一來，非同步討論之所有理想功能皆無法發揮。誠如強調社會學習理論(social theory of learning) 學者 Wenger [28] 所言，學習無法僅由設計產生，任一機制的建置，並不能保證絕對產生此機制之理想效果，重點在於教學活動需適當配合，及學習者需實際投入參與，才能達到教學設計之理想功效。有鑒於此，本論文之目的即在探討非同步討論應用於「以內容為主」之英語課程中的實施成效與影響其成效之因素。本論文乃根據作者三年來應用非同步討論於大學專業英語課程，結合語言學習與反思學習之教學情況，做一研究探討。

2. 略

3.

3.1 研究對象與場域

本研究為教室本位行動研究(classroom-based action research) 性質，研究者本身亦為授課教師。本研究將非同步討論應用於「以內容為主」之大學專業英語課程，已進行三年(2003 至 2005 年)。研究對象為這三年修習本人於大三上學期所開授之必修課「外語學習者」之應用英語系學生，2003 年修課人數為 41 人，2004 年與 2005 年皆為 35 人。該課程教學目標是讓學生瞭解外語習得理論與影響外語學習之各種因素，並結合自身外語學習經驗與課堂所學，做不斷反思與應用，以增進外語學習成效。該課程除傳統課堂面對面授課外，並以非同步討論做為課室延伸、輔助學習之用。研究重點，在於分析學生參與非同步討論活動情況，學生應用此機制之態度與學習成效，及影響其成效之因素。

3.2 非同步討論實施方式

這三年來，非同步討論應用於此門專業英語課程皆是利用美國 Nicenet (<http://www.nicenet.org>) 的免費網路教室輔助工具(Internet Classroom Assistant) 所提供之非同步討論區來進行課後輔助學習與討論，介面相當容易操作，但只限於文字傳送(text-based)。非同步討論活動採小組方式進行，因修課人數頗多，因此先隨機將學生分成四組，一組 8-11 人，以利小組成員做較深入之經驗與意見交流，並且讓學生每週閱讀小組成員所發表或回應之篇數不致過多。每組學生基本上與自己組裡其他成員進行一整學期之討論，但亦允許學生到別組「旁聽」或

偶爾「串門子」。討論議題則由教師配合課程教學內容決定並給予提示，強調結合外語學習理論與外語學習經驗之反思及應用(例子如下)。學生不但需要針對教師設計之議題發表個人看法，亦需就小組成員發表之看法彼此給予回應，可用提問、辯論、贊同肯定、進一步闡釋、或提供新觀點等方式進行。學生在非同步討論活動之表現，佔其總成績 30%。

討論議題例子：

Topic: Analyzing your errors

For the following two weeks, I'd like you to analyze the errors you've made in your foreign language learning process. According to Chapter 4, there are five types of errors in learner language: developmental errors, overgeneralization errors, simplification errors, misuse of formulaic expressions, and interference errors. As a second language learner, I believe we've all made these five types of errors. Try to recall the errors you have made and categorize them into different types. Please give specific examples and then analyze them. In addition, I'd also like you to comment on how these errors helped you to learn the foreign language better.

在非同步討論活動之設計上，這三年來並不盡全然相同，教師每年有略做更改。以下列表說明不同之處：包括每學期討論題目總數、每個議題討論時間、學生回應規定、及教師參與討論程度等。

表一非同步討論三年來實施方式不同之處

表一 非同步討論三年來實施方式不同之處

| | 每學期討論議題總數 | 每個議題討論時間與回應規定 | 教師參與討論程度 |
|-----------|-----------|---|---|
| 2003 第一學期 | 12 | 幾乎一週討論一個新議題，包括針對教師提問發表己見，及選擇兩個同學所發表之文章給予回應。 | 參與討論相當積極，每個議題下教師給予每組 2-5 篇回應。 |
| 2004 第一學期 | 8 | 大約兩週討論一個新議題，第一週針對教師提問發表己見，第二週選擇至少兩個同學所發表之文章給予回應。 | 很少參與，但若發現學生有誤解題意或回答有疏失，教師會私下寄 email 給予個人指正。每一議題結束後，教師會在課堂上，對各組討論內容公開給予回應。 |
| 2005 第一學期 | 7 | 大約兩週討論一個新議題，第一週針對教師提問發表己見，第二週選擇至少兩個同學所發表之文章給予回應，並提醒若同學於回應中問問題，作者需再給予回覆。 | 同上 |

3.3 資料收集與分析

本研究之資料包括下列三大項：(1) 學生進行非同步討論活動之電腦記錄。包含每學期線上討論之所有文字內容，每位學生發表及回應文章之篇數、與每篇文章之字數。(2) 非同步討論實施成效問卷調查。於期末時請學生採無記名但註明組別方式填寫問卷，自評其線上討論之表現情況，及參與線上討論對課程內容學習之幫助與語言能力之增進滿意度，以及探究一些教學相關因素，包括課程內容、討論議題設計、線上討論機制使用難易度、學生本身英語能力、同儕表現與小組互動等，如何影響其參與非同步討論活動及學習成效。回答形式採 Likert 五點評量式設計，此外亦有開放式問題，請學生以文字說明原因。每年問卷題目大致相同，但有些微改變。(3) 小組訪談及錄音資料。於期末時與各組學生進行小組訪談約 30-40 分鐘，從學生觀點，進一步了解影響各組非同步討論之進行及應用於此英語專業課程學習成效之因素。資料分析則包括非同步討論活動學生參與度分析，問卷調查結果分析，與小組訪談資料分析。訪談資料乃根據主題進行分類整理與歸納，目的是找出一些問卷調查上沒有列出之影響因素，及學生對此機制運用在語言教學上之其他看法。

4.

4.1 非同步討論參與度與實施方式比較

從表二來看，這三年來學生在非同步討論之參與度，有逐年增高之趨勢。不但首篇根據教師提問之文章發表率增加及內容增長，而且同儕互相回應的篇數亦增加，但回應的文章在 2005 班級最短。這有可能是因為 2005 班級的學生互回文章次數最高(平均每一學生在每一討論議題互回 3.76 篇文章)，亦即線上互動性最高，因互動頻繁而致每篇回應的內容較以前班級學生的回應為短。

表二非同步討論活動學生參與度

| | 首篇根據教師提問發表率 | 首篇發表文章平均字數 | 每個議題學生互回平均篇數 | 學生互回文章平均字數 |
|---------------------|-------------|------------|--------------|------------|
| 2003 班級 (N = 41) | 92% | 253 | 1.45 | 88 |
| 2004 班級 (N = 35) | 97% | 323 | 2.93 | 95 |
| 2005 班級 (N = 35) | 98% | 360 | 3.76 | 62 |

這三年來學生在非同步討論的參與情況，亦顯示出實施方式不同有可能造成影響之一。在 2003 班級的討論議題總數最多，學生幾乎一週討論一個新議題，包括針對教師提問發表己見，及回應同組成員所發表之文章，討論時間非常緊迫，因此壓力增大，而導致參與度反而下降，尤其是後半學期，一些學生甚至以課業壓力太重為由而放棄參與非同步討論。這也是促使我在 2004 年繼續實施此活動時，將每個議題討論時間拉長為兩星期，效果明顯較前次表現為佳。而在 2005 年因特別強調，若小組成員在給予的回饋中有問問題，發表該篇文章的作者需再給

予答覆，有可能因此新規定使得 2005 班級互動性最佳；而因互動性增加，可以理解學生回覆的內容較短。雖這班學生互回文章字數較少，但值得注意的是，他們首篇發表文章的字數是最長，這顯示他們對議題有更為深入的個人反思，發表文章之內容因而更為詳盡。

此外，這結果也顯示出教師是否參與學生課後非同步討論，似乎與學生實際參與度無明顯關係。如 2003 年結果所示，教師積極參與討論，卻未能因此使學生的參與度增高。而在 2004 及 2005 年，教師雖無加入學生討論，但可能是因為每個議題討論的時間加長，而讓學生表現更好。雖然如此，學生亦表示教師對此活動的重視與關心，會影響他們的參與度。根據這三年的教學經驗，本人發現教師在課堂上對學生非同步討論內容公開給予回應的效果，似乎高於教師實際參與線上討論的效果。有學生在訪談時亦提到，他們非常在乎教師在課堂上的公開回應，不論教師提到的內容是來自他們自己或是其他同學所發表的文章，都有助於提升他們更大動機參與此項討論活動。

4.2 學生對實施非同步討論之態度

三年來學生對實施非同步討論應用於此門英語專業課程之態度，並無明顯差異(見表三)。在喜歡程度上，大約是 50% 左右的學生表示喜歡此機制，原因包括方便、新奇有趣、增加同學互動機會、很活的學習方式、幫助複習課堂所學、增加使用英文機會等。而大約 40% 左右的學生表示無特別喜好，只有近 10% 的學生表示不喜歡此活動，原因為太過費時、用寫的比用講的麻煩、課業因此變重、使用電腦不方便、或不喜歡看電腦等。

表三學生對實施非同步討論之態度

| | 喜歡以此機制 輔助學習程度 | | | 認為此機制適合 應用於本門課程程度 | | |
|----------------------------------|------------------|-------------|------------|----------------------|-----------|---------|
| | 喜歡 | 沒 意見 | 不 喜歡 | 適合 | 沒 意見 | 不 適合 |
| 2003 班級 (N = 41) | 20 (49%) | 17 (41%) | 4 (10%) | N/A | | |
| 2004 班級 (N = 34) ¹ | 17 (50%) | 15 (44%) | 2 (6%) | 31 (91%) | 3 (9%) | 0 |
| 2005 班級 (N = 32) ² | 17 (53%) | 13 (41%) | 2 (6%) | 31 (97%) | 1 (3%) | 0 |

當問及此機制是否適合用於此門課程時，2004 與 2005 兩班級皆有高於 90%²的學生表示適合 (2003 班級的問卷無此題)。主要原因是學生認為這個機制可使他們透過經驗與意見分享，來互相學習，吸收不同看法，更加了解課程內容。而且，也可運用課堂所學理論，在線上與同學討論，激發更多的想法。有學生甚至提到，特別是因為這門課內容就是談外語學習，更需此項活動，學生表示「我們都身為外語學習者，本身就有很豐富的經驗可以分享，而外語學習過程裡有很多值得探討的地方，線上討論不會佔用上課時間，又可幫助我們思考及得到額外訊

² 2004 班級共有 35 位學生，但實收問卷 34 份(97%)。 2005 班級共有 35 位學生，但實收問卷 32 份(91%)。

息，非常適合這門課」。學生的態度與反應也顯示出，他們有意識到也有體會到非同步討論帶來的正面成效，尤其是在反思學習上。

4.3 學生自評非同步討論之學習成效

從表四可得知，三年來學生對此機制應用於這門「以內容為主」之專業英語課程的學習成效，皆持高度肯定，特別是在輔助課程內容學習上。在 2005 班級的問卷，進一步將課程內容學習細分為理解、分析、與理論應用三項能力，可看出學生認為此機制之運用在這三項上皆有極大助益，而幫助最大在於理解課程內容，理解能力雖為三項中最基本、但也是最重要的認知能力。學生表示因為這門課包含許多理論，而理論經常是非常抽象，不易瞭解，但經由討論與交換經驗實例，可有效瞭解理論內容；而在理論理解後，才能加以分析與應用。此外，亦有學生提到，經由參與非同步討論，使他們覺得自己像個「專家」，不但對外語學習理論變得很懂，而且還能藉由彼此討論「批判」不同學者的理論，進而產生自己的獨立想法，這是他們在別門課上從未有過的經驗。非同步討論活動的參與，使得學生真正體驗到知識是可以經由建構而來。

表四也顯示出，學生認為此機制輔助他們學習課程內容之成效高於輔助他們語言能力增進之成效。在 2005 班級學生自評此機制輔助語言能力之成效，還略低於前兩年之自評結果。但從這三年問卷調查結果來看，每年仍有超過 50% 以上的學生認為此機制可有效輔助語言能力之增進。

表四學生自評非同步討論之學習成效

| | 有助於課程內容學習 | | | 有助於語言能力增進 | |
|---------------------|-----------|------|--------|-----------|------|
| 2003 班級 (N = 41) | 3.93 | | | 3.79 | |
| 2004 班級 (N = 34) | 4.18 | | | 3.77 | |
| | 4.01 | | | 3.53 | |
| 2005 班級 (N = 32) | 理解能力 | 分析能力 | 理論應用能力 | 寫作能力 | 閱讀能力 |
| | 4.19 | 3.94 | 3.91 | 3.56 | 3.50 |

(根據 Likert 五點評量式計分，最高 5 分，最低 1 分)

雖大多數學生表示每星期用英文發表或回應文章，對英文讀寫能力多少會有提升；但是，其提升程度，似乎與個人對非同步討論文章之語言表現的認知程度有關。從問卷及訪談中可得知，當學生認為非同步討論不需講求文法用字，只要能溝通就好，或是想寫什麼就寫什麼，以很口語方式表達時，他們則不認為此機制在語言能力增進上有多大助益，他們較重視的是想法的交流；反之，也有學生因為在意自己在線上發表文章的語言表現，所以會用心組織內容、注重自己的文法用字，也會去欣賞及學習其他同學的用字遣詞及表達方式，會去思考如何寫得條理分明，因而感受到自己英語讀寫能力有明顯增進。因此，非同步討論對語言學習上的幫助，與個人對討論區發表文章之語言表現的重視程度可能有相當大的關係。

另外，也有學生指出，因為每週參與非同步討論，英文寫作的流利度增加，

閱讀速度增加，思考反應速度亦增加，這對他們參加一些英語檢定考試極有幫助，特別是讓他們可以在短時間內很快構思，寫出一篇有內容的文章。這亦是非同步討論對語言學習輔助上，不容忽視的一項助益。

4.4 非同步討論各組差異與學習成效比較

雖然這三年來學生對於非同步討論機制應用於此門英語專業課程輔助學習之態度與成效，多持正面肯定，並且自評結果三年來亦無顯著差異；但是，若就每年各組成員參與度及互動性來看，則發現其對於非同步討論之學習成效有產生相當影響。表五與表六交互參照可發現，參與度與互動性較高的組別，其自評學習成效亦較高，如2003 班級的 C 組，2004 班級的 A 組，及2005 班級的 A 組。這些小組不但發表或回應文章的字數通常較別組多，更重要的是，他們的互回篇數皆較別組多，亦即小組成員互動性皆最高。

表五三年來各組非同步討論參與度比較

| | | | | |
|----------------|------------|------------|------------|------------|
| 2003 班級 | A 組 | B 組 | C 組 | D 組 |
| 每個議題 首篇發表率 | 92% | 85% | 95% | 95% |
| 首篇平均 字數 | 265 | 204 | 331 | 210 |
| 每個議題 互回篇數 | 1.55 | 0.77 | 1.78 | 1.69 |
| 互回文章 平均字數 | 83 | 64 | 120 | 83 |
| 2004 班級 | A 組 | B 組 | C 組 | D 組 |
| 每個議題 首篇發表率 | 100% | 100% | 89% | 100% |
| 首篇平均 字數 | 354 | 368 | 285 | 284 |
| 每個議題 互回篇數 | 3.68 | 2.46 | 2.63 | 2.94 |
| 互回文章 平均字數 | 105 | 138 | 72 | 66 |
| 2005 班級 | A 組 | B 組 | C 組 | D 組 |
| 每個議題 首篇發表率 | 95% | 100% | 97% | 100% |
| 首篇平均 字數 | 410 | 344 | 374 | 312 |
| 每個議題 互回篇數 | 4.07 | 3.30 | 3.80 | 3.85 |
| 互回文章 平均字數 | 61 | 62 | 58 | 67 |

表六三年來各組自評非同步討論成效比較

| 2003 班級 | A 組 | B 組 | C 組 | D 組 |
|-----------|------|------|------|------|
| 有助於課程內容學習 | 3.77 | 3.75 | 4.20 | 3.93 |
| 有助於語言能力增進 | 3.42 | 3.74 | 4.14 | 3.85 |
| 2004 班級 | A 組 | B 組 | C 組 | D 組 |
| 有助於課程內容學習 | 4.67 | 4.11 | 4.00 | 3.86 |
| 有助於語言能力增進 | 4.00 | 4.11 | 3.44 | 3.71 |
| 2005 班級 | A 組 | B 組 | C 組 | D 組 |
| 有助於課程內容學習 | 4.38 | 3.78 | 3.97 | 3.97 |
| 有助於語言能力增進 | 3.79 | 3.44 | 3.33 | 3.62 |

另外，從問卷調查與訪談中得知，這三個線上互動性最高的小組，其成員互動方式與原因並不相同。2003 班級的 C 組互動極佳，主要是因為組裡有一年紀稍長成員，扮演如「小老師」或「大哥哥」的角色，他非常熱愛非同步討論活動，除自己積極參與外，並不停鼓勵同組組員參與，他一直是組裡討論表現最踴躍的，並且，他會用許多讚美與鼓勵的語言在他回應的文章裡。許多他的組員皆表示，他們非常喜歡讀他發表或回應的文章，他的文章經常讓他們感動，因而促使他們有更強烈的動機參與線上討論。而整組成員也因為他的帶動，彼此感情增加，學習意願增強，因此不論在線上或課堂上皆可感受到他們這組強烈的「學習社群」意識。

2004 班級 A 組的互動性高，乃因每位成員從一開始就很積極參與討論，他們並且認為自己受同組組員影響極大，因大家在線上討論表現皆極佳，基於榮譽感，自己亦不能落於人後。此外，這組進行的非同步討論有一值得注意的現象，即每個議題的討論，沒有成員會沒收到回應的文章。他們表示，回應相當重要，他們有時就特意選擇尚未有回應的文章來回，而並非全然根據自己對文章的興趣而回。再者，他們這組也較常用問問題的方式給予回應，而這種提問引導式策略，也因而刺激更多的回應與互動。最後，也要提及這組不但在線上討論互動性最高，在課堂互動上也是最好，而後者的互動對於他們的線上互動有極大的幫助。

至於 2005 班級的 A 組，其線上互動性高的原因與前兩組情況則非常不同。這組學生在課堂上的互動表現並非最佳，他們還認為平常的互動和線上的互動並無太大關係；但是，他們不斷強調成績誘因，乃為最重要的參與動機。因非同步討論的表現要列入評分，他們因此努力把這項「作業」做好，甚至有學生坦白指出，他們是為分數而參與討論，而非真正想做。但也有學生表示，他們逐漸發展出參與此討論之興趣，乃因這機制可讓他們從小組成員學到許多不同經驗與看法，為了想學更多，因而積極參與。事實上，這組成員「用功型」學生較多，期中及期末考成績也是這組表現最為優秀。或許也因此原因，使這組學生對非同步討論之輔助學習成效，自評結果最高。

從以上這三組線上討論情況來看，造成其互動性高的原因不盡相同，包括：

小組領導者的風格、同儕表現的影響、學習社群意識的建立、平時非線上的互動、小組成員回應文章的方式，對成績的重視、以及對此機制輔助學習的認同等。然而，可以確定一點的是，不論線上互動原因為何，學生在非同步討論的參與及互動程度，會影響其自評此機制對輔助學習的成效；也就是說，學生參與的程度愈高，輔助學習的成效對學生而言就愈明顯。

5.

本研究應用非同步討論於「以內容為主」之大學專業英語課程，進行三年來，深刻體受到此機制可有效結合反思學習與語言學習，輔助學生課程內容理解與應用，並可同時增進語言讀寫能力。此機制之運用，使得反思過程由獨白式之語言，轉化成多人交談式之互動，因而擴大學習者之經驗內容，並可融合多種不同看法與觀點，使反思學習效果更為增強。而學生也能藉此活動，以所學外語在真實情境下，進行有目的、有意義之溝通，表達自我想法與交換經驗心得，可增進外語表達流利度，以及使用外語之行動力(agency)。Warschauer [26] 在談及電腦輔助語言教學的新趨勢時，即指出現今 21 世紀，語言學習特別重視社會認知，因此在教學上強調真實情境式溝通及「以內容為主」的課程設計，而對語言學習的目標設定，也從傳統強調正確性，轉變到流利度，再到今日著重於學習者本身的行動力，鼓勵以自主、自決、自我負責的態度學習語言，並進而將所學語言在實際情境中應用出來。在多種輔助語言教學的電腦科技中，非同步討論，即為一項可幫助學習者發展行動力之有效機制，充分結合反思學習與真實情境語言學習及應用。

實施非同步討論活動三年來，很高興發現學生的參與度都頗高，且有逐年增高之趨勢，而學生對此機制之態度，雖僅半數表示喜歡(但也僅不到 10% 表示不喜歡，其他則持中立態度)，但有高達 90% 以上的學生認為適合將非同步討論應用於此門「以內容為主」之專業英語課程。這顯示出學生對此機制應用的高度肯定，並且亦能認同其輔助學習價值，他們雖感受到課業因此加重，但也能實際體驗到此機制為他們學習上帶來的助益。他們對此機制在課程內容學習輔助上，給予極高的評價，尤其是幫助他們多元思考議題，更深入瞭解與應用所學。而在語言能力增進輔助上，則因個人對線上討論內容的語言表現認知程度不一，而影響其發表或回應文章之用字、文法、及組織等表現，進而影響他們對非同步討論在語言學習輔助成效上之看法。儘管看法有不同，多數學生仍持正面評價，特別是此機制增加他們使用英文表達自我想法之機會，並增進英文讀寫流利度。其中一名學生在問卷上回答的很好，也道出了非同步討論實施的精神與目的：「我從來不知道我可以用英文想這麼多、寫這麼多，看著自己與同學在線上討論寫的內容，我真的覺得很驕傲，用英文思考不是件容易的事，但我們做到了，這讓我覺得自己真的像個大學生」。

非同步討論的輔助學習成效雖深受肯定，但其實際實施成果，仍受諸多因素影響，尤其是學生的參與和互動程度。沒有參與和互動，就不會有學習產生。以下根據這三年來的教學實施情況及研究結果，提出一些非同步討論應用於語言教

學之建議。

(一) 學生在非同步討論的表現需列入成績評量，且需明確規定在質與量上之要求。例如，首篇根據教師提問發表之文章，需花較多時間構思組織，內容應力求完整；而互相回應部份，需至少給予同組兩名成員所發表的文章作回應，可用提問、辯論、贊同肯定、進一步闡釋、或提供新觀點等方式進行，而得到回應的學生，需視情況再進一步回覆。學生為了成績，多半會更加積極參與討論。

(二) 發表或回應的文章，需要求語言表達清楚明瞭。雖討論重點在於內容，而且文法上亦不視絕對正確，並允許以口語式英文參與討論，但所寫的英文需通順並讓讀者能看懂。此外，要求學生回應時需注意言語禮貌，並避免空洞的言詞，所提之問題或意見需有建設性。

(三) 每個議題討論的時間需夠長，才能讓學生有更深入之反思，與更多同儕互動，而且也不會造成學生參與此活動之壓力過大。但若討論時間過長，學生有可能因失去新鮮感而不再繼續討論。建議每個議題可討論二或三星期。

(四) 適當分組，各組討論人數不宜過多或過少，理想人數建議為一組 6 至 10 人。目的在於維護討論品質，且增加同儕互動，並也避免各組討論的內容過多，而致負擔過重。但可允許學生至別組閱讀其他同學的討論，以達相互觀摩之效。

(五) 鼓勵各組成員發展小組團隊意識與學習社群意識，隨時分享所學所知。一般而言，學生極易受到同儕行為表現與態度的影響，因此小組成員平時感情的建立與互動，以及對自己小組的認同，皆對其線上討論之參與及互動有正面影響。

(六) 當非同步討論應用於輔助課室面對面教學時，教師是否加入學生的討論並非絕對必要，但教師需重視與關心此活動。教師可利用面對面上課時，對學生在非同步討論的內容公開給予回應，這有助於提升學生參與此討論活動之動機。但若發現學生有誤解題意或回答有疏失時，教師可私下寄 email 給予學生個人指正與引導。

本研究希望能有助於台灣的語言教師，更瞭解及善用非同步討論機制於「以內容為主」之語言教學課程，結合反思學習與語言學習，以增進學生對內容知識之瞭解，並發展多元思維，擴大經驗層面，以及訓練學生在語言學習上建立自主行動力。事實上，非同步討論，在現今已不算是一種新的學習機制，但是，它的「新」是建立在將它應用於語言教學的方法上。而正是因為它仍算新，還有不斷發展的潛力與可能性，以及還有許多值得我們研究探討的議題。因此，亦盼有更多教師願意嘗試將非同步討論應用於各種語言教學中，並投入此領域做更深入之研究，進而可針對不同語言教學目的，發展出各種有效的非同步討論輔助教學方式。

參考文獻

- [1] 陳秋蘭 (2002)。Teaching Reading and Critical Thinking to University Students。九十學年度中區英文教師教學之英文閱讀教學與評量研討會。
- [2] 許榕倫 (2002)。網路讀書會對中學教師英語素養之效益研究。國立高雄師範大學英語學系碩士論文，高雄市。
- [3] 劉顯親(2000)。網路與英語教育:科技、語言、及學習。「網路與社會」研討會，國立清華大學。
- [4] 劉顯親(2003)。大學英文教育之規劃：現狀及願景。英語教育電子月刊第二期。
- [5] 謝淑媚(2006)。運用網際網路於德語外語課程-德語文學導讀課堂研究。國立高雄第一科技大學第四期應用外語學報。
- [6] Beauvois, M. (1998). Conversations in slow motion: Computer-mediated communication in the foreign language classroom. *The Canadian Modern Language Review*, 54(2), 198-217.
- [7] Benson, P. & Voller, P. (1997). *Autonomy and Independence in Language Learning*. London:Longman.
- [8] Biesenbach-Lucas, S. (2003). Asynchronous discussion groups in teacher training classes: Perceptions of native and non-native students. *Journal of Asynchronous Learning Networks*, 7 (3),24-46.
- [9] Brown, H. D. 2002. Can you be politically correct and pedagogically critical in your classroom? Selected Papers from the 11th International Symposium on English Teaching/4th Pan Asia
- [10]Chen, C-F. (2005). Experience-based Language Learning through Asynchronous Discussion. Proceedings of the 22nd International conference on English Teaching and Learning in the Republic of China (pp. 28-43). Taipei: National Taiwan Normal University
- [11]Dewey, J. (1933). *How we think*. Boston: D CHealth and Co.
- [12]Farrell, T. S. C. (1999). Reflective practice in an EFL development group. *System*, 27, pp. 157-172.
- [13]Freire, P. & Faundez, A. (1989). *Learning to question: A pedagogy of liberation*. New York: The Continuum Publishing Co.
- [14]Giroux, H. A. (1988). *Teachers as intellectuals: Toward a critical pedagogy of learning*. New York: Bergin & Garvey.
- [15]Kahmi-Stein, L. (2000). Looking to the future of TESOL teacher education: Web-based bulletin board discussions in a methods course. *TESOL Quartely*, 34 (3), 423-455.
- [16]Kullman, J. (1998). Mentoring and the development of reflective practice: Concepts and context. *System*, 26, 471-484.

- [17]Lamy, M-N. & Goodfellow, R. (1999). Reflective conversation in the virtual classroom. *Language Learning & Technology*, 2 (2), 43-61.
- [18]Langer, A. M. (2002). Reflecting on Practice: Using learning journals in higher and continuing education. *Teaching in Higher Education*, 7 (3), 337-351.
- [19]Liou, H-C. (1999). What can we learn from critical pedagogy? Implications for EFL reading and writing instruction. Proceedings of the 16th conference on English teaching and learning in the Republic of China (pp. 161-174). Taipei: Crane.
- [20]Little, D. (1995). Learning as dialogue: The dependence of learner autonomy on teacher autonomy. *System*, 32, 175-181.
- [21]Moon, J. A. (2000). *Learning journals: A handbook for academic, students and professional development*. London: Kogan Page Limited.
- [22]Pennycook, A. (2001). *Critical applied linguistics: A critical introduction*. Mahwah, NJ: Lawrence Erlbaum Associates.
- [23]Sengupta, S. (2001). Exchanging ideas with peers in network-based classrooms: An aid or a pain? *Language Learning & Technology*, 5 (1), 103-134.
- [24]Stepp-Greany, J. (2002). Student perceptions on language learning in a technological environment: Implications for the new millennium. *Language*
- [25]Warschauer, M. (1998). Interaction, negotiation and computer-mediated learning. In V. Darleguy, A. Ding, & M. Svensson (Eds.), *Educational technology in language learning: Theoretical considerations and practical applications* (pp. 125-136). Lyon, France: National Institute of Applied Sciences, Center of Language Resources.
- [26]Warschauer, M. (2004). Technological change and the future of CALL. In S. Fotos & C. Brown (Eds.), *New Perspectives on CALL for Second and Foreign Language Classrooms* (pp. 15-25). Mahwah, NJ: Lawrence Erlbaum Associates.
- [27]Weasenforth, D., Biesenbach-Lucas, S. and Meloni, C., (2002). Realizing constructivist objectives through collaborative technologies: Threaded discussions. *Language Learning & Technology*, 6 (3), 58-86.
- [28]Wenger, E. (1998). *Communities of practice: Learning, meaning, and identity*. Cambridge, UK: Cambridge University Press.

Appendix E: Draft of the global move and the local pattern scales for the expert review

| Category | Criteria (citation) | Agree | Disagree | Comments |
|---|---|-------|----------|----------|
| 1.1 Global structure (rhetorical moves) | <u>Move:</u> Existence, Proportion, Sequence, Coherence | | | |
| 1.1 Global structure (rhetorical moves). | <u>Content:</u> Accuracy, Effectiveness | | | |
| 1.2 Local structure (lexico-grammatical patterns). | <u>Language Use:</u> Accuracy (lexico-grammatical use) Appropriateness (vocabulary range, syntactic variety, hedging & booster choice) (Jargons are excluded from scoring, from the writing prompt). | | | |
| 1.2 Local structure (lexico-grammatical patterns) | <u>Brevity:</u> Conciseness, Cohesiveness (as paragraph(s)) | | | |
| 1.1 The Global move scale (rhetorical moves) | | | | |
| Category | Criteria (citation) | Agree | Disagree | Comments |
| Score 5 | <i>An abstract at this level accomplishes all of the following:</i> (IBT Independent writing) | | | |
| | <u>Move</u> All obligatory moves (moves of purpose-method-results, defined by Pho, 2008) are present; optional moves (moves of background and conclusion) may be present(Stroller, Horn, Grabe& Robinson, 2005) Each move is distributed in a well-balanced proportion. (Hsieh & Liou, 2008) | | | |
| | Moves are distributed in an appropriate sequence. (e.g., background-purpose-method-results-conclusion) (Swales & | | | |

| | | | | |
|-----------------|--|--------------|-----------------|-----------------|
| | Feak 2004, 2009) Moves are used to structure unity, progression, and coherence of the abstract. (IBT Independent writing) | | | |
| | <u>Content</u> Research purposes, methods, and results are effectively and accurately summarized. (Online material 1) If provided, research backgrounds and conclusions are effectively and accurately summarized. (Online material1). | | | |
| Category | Criteria (citation) | Agree | Disagree | Comments |
| Score 4 | <i>An abstract at this level accomplishes all of the following:</i> (IBT Independent writing) | | | |
| | <u>Move</u> All obligatory moves are present (moves of purpose-method-results); optional moves (moves of background and conclusion) may be present. (Stroller et al., 2005) Each move is distributed in a balanced proportion. (Hsieh & Liou, 2008) One move may be out of sequence or has minor problems. (Swales & Feak 2004, 2009) Moves are used to structure unity, progression, and coherence of abstracts, though it may contain occasional redundancy, digression, or unclear connections. (IBT Independent writing) | | | |
| | <u>Content</u> Research purposes, methods, and results are effectively and accurately summarized, but some points are not completely clear. (Online material 1) If provided, research backgrounds and conclusions are accurately summarized, but some points are not completely clear. (Online material 1) | | | |
| Category | Criteria (citation) | Agree | Disagree | Comments |
| Score 3 | <i>An abstract at this level is marked by one or more of the following:</i> (IBT Independent writing) | | | |
| | <u>Move:</u> Most obligatory moves are present; optional moves may be present. (Stroller et al., 2005) Few moves have minor problems, such as out of proportion | | | |

| | | | | |
|-----------------|--|--------------|-----------------|-----------------|
| | (e.g., too much in background or method), underdeveloped, or out of sequence. (Hsieh & Liou, 2008; Swales & Feak 2004, 2009) Moves are used to display unity, progression, and coherence, though connection of ideas may be occasionally obscured. (IBT Independent writing) | | | |
| | <u>Content</u> Research purposes, methods and results are understandably summarized, but some points are irrelevant, omitted, or imprecise. (Online material 1) If provided, research backgrounds and conclusions are understandably summarized, but some points are omitted, irrelevant, or imprecise. (Online material 1) | | | |
| Category | Criteria (citation) | Agree | Disagree | Comments |
| Score 2 | <i>An abstract at this level reveals one or more of the following:</i> (IBT Independent writing) | | | |
| | <u>Move:</u> One obligatory move is missing or underdeveloped; optional moves may be present (Stroller et al., 2005). Some moves have problems such as out of proportion (e.g., too much in background or method), underdeveloped, or out of sequence. (e.g., background-purpose-method-results-conclusion) (Hsieh & Liou, 2008; Swales & Feak 2004, 2009). Moves are used with inadequate organization and connections of ideas. (IBT Independent writing) | | | |
| | <u>Content</u> Research purposes, methods, and results are inadequately summarized, and some points are irrelevant, omitted, or imprecise. (Online material 1) If provided, research backgrounds and conclusions are only partly summarized, and some points are irrelevant, omitted, or imprecise. (Online material 1). | | | |
| Category | Criteria (citation) | Agree | Disagree | Comments |
| Score 1 | <i>An abstract at this level is seriously flawed by one or more of the following weaknesses:</i> (IBT Independent writing) | | | |

| | | | | |
|---|--|--------------|-----------------|-----------------|
| | <p><u>Move</u></p> <p>Two obligatory moves are missing or underdeveloped; optional moves may be present. (Stroller, Horn, Grabe, & Robinson, 2005)</p> <p>Most moves have major problems, such as out of proportion, underdeveloped, or out of sequence (Hsieh & Liou, 2008; Swales & Feak 2004, 2009).</p> <p>Moves are used with serious disorganization. (IBT Independent writing).</p> | | | |
| | <p><u>Content</u></p> <p>Research purposes, methods and results are summarized in a vague and wordy manner, but most points are irrelevant, omitted, or imprecise. (Online material 1)</p> <p>If provided, research backgrounds and conclusions are summarized in a vague and wordy manner, and most points are irrelevant, omitted, or imprecise. (Online material 1).</p> | | | |
| Category | Criteria (citation) | Agree | Disagree | Comments |
| Score 0 | <i>An abstract at this level is seriously flawed by one or more of the following:</i> (IBT Independent writing) | | | |
| | <p><u>Move</u></p> <p>Optional moves may be present; three obligatory moves are completely missing or underdeveloped, making the abstract not connected to the topic. (Stroller et al., 2005) (Swales & Feak 2004, 2009) (IBT Independent writing).</p> | | | |
| | <p><u>Content</u></p> <p>Research purposes, methods, and results are incomprehensibly summarized, and a majority of points are irrelevant, omitted, or imprecise. (Online material 1)</p> <p>If provided, research backgrounds and conclusions are incomprehensibly summarized, and a majority of points are irrelevant, omitted, or imprecise. (Online material 1).</p> | | | |
| 1.2 The local patten scale (lexico-grammatical patterns) | | | | |
| Category | Criteria (citation) | Agree | Disagree | Comments |
| Score 5 | <p><i>An abstract at this level largely accomplishes all of the following:</i></p> <p>The abstract</p> | | | |
| | <p><u>Language Use</u></p> <p>-demonstrates syntactic variety, appropriate word choice, and idiomaticity, though it may have minor lexical or</p> | | | |

| | | | | |
|-----------------|--|--------------|-----------------|-----------------|
| | <p>grammatical errors. (jargons are excluded from scoring) (IBT Independent writing)</p> <p>-displays consistent facility in the use of hedging and booster (Swales & Feak 2004, 2009)</p> | | | |
| | <p><u>Brevity</u></p> <p>-demonstrates sophisticated clarity and conciseness. (Online material 2)</p> <p>-has highly-cohesive paragraph(s). (Online material 3)</p> | | | |
| Category | Criteria (citation) | Agree | Disagree | Comments |
| Score 4 | <p><i>An abstract at this level largely accomplishes all of the following</i> (IBT Independent writing)</p> <p>The abstract</p> | | | |
| | <p><u>Language Use</u></p> <p>-demonstrates syntactic variety and range of vocabulary, though it will probably have occasional noticeable minor errors in structure, word form, or use of idiomatic language that do not interfere with meaning. (jargons are excluded from scoring) (IBT Independent writing)</p> <p>-displays facility in the use of hedging and booster (Swales & Feak 2004, 2009).</p> | | | |
| | <p><u>Brevity</u></p> <p>-demonstrates satisfactory clarity and conciseness. (Online material 2)</p> <p>-has generally cohesive paragraph(s), though some points are merely enumerated in the text. (Online material 3)</p> | | | |
| Category | Criteria (citation) | Agree | Disagree | Comments |
| Score 3 | <p><i>An abstract at this level is marked by one or more of the following:</i></p> <p>The abstract</p> | | | |
| | <p><u>Language Use</u></p> <p>-demonstrates inconsistent facility in the use of syntactic variety and word choice (jargons are excluded from scoring), resulting in occasional lack of clarity and obscure meaning (IBT Independent writing)</p> <p>-displays accurate but limited range of syntactic structures and vocabulary (IBT Independent writing)</p> <p>-demonstrates inconsistent facility in the use of hedging and booster (Swales & Feak 2004, 2009).</p> | | | |
| | <p><u>Brevity</u></p> <p>-demonstrates clarity and conciseness. (Online material 2)</p> <p>-has some cohesive paragraph(s), yet some points are merely enumerated, rather than formulated as sentences. (Online</p> | | | |

| | | | | |
|-----------------|---|--------------|-----------------|-----------------|
| | material 3) | | | |
| Category | Criteria (citation) | Agree | Disagree | Comments |
| Score 2 | <i>An abstract at this level reveals one or more of the following:</i> (IBT Independent writing) The abstract | | | |
| | <u>Language Use</u> -has a noticeably inappropriate choice of words or word forms (IBT Independent writing) -has an accumulation of errors in sentence structure and/or language usage (IBT Independent writing) -has a noticeably inappropriate choice of hedging and booster (Swales & Feak 2004, 2009). | | | |
| | <u>Brevity</u> -demonstrates limited clarity or conciseness.(Online material 2) -has some disorganized and incoherent paragraph(s), and some points are merely enumerated, rather than formulated as sentences. (Online material 3). | | | |
| Category | Criteria (citation) | Agree | Disagree | Comments |
| Score 1 | <i>An abstract at this level is seriously flawed by one or more of the following weaknesses</i> (IBT Independent writing) The abstract | | | |
| | <u>Language Use</u> -has serious and frequent errors in language usage, and without hedging and booster (Most descriptors are taken from IBT Independent writing, while descriptors boldfaced are taken from Swales & Feak 2004, 2009). | | | |
| | <u>Brevity</u> -lacks clarity or conciseness. (Online material 2) -has several disorganized and incoherent paragraph(s), and most points are merely enumerated, rather than formulated as sentences. (Online material 3). | | | |
| Category | Criteria (citation) | Agree | Disagree | Comments |
| Score 0 | <i>An abstract at this level is seriously flawed by one or more of the following weaknesses</i> (IBT Independent writing) The abstract | | | |
| | <u>Language Use</u> -merely copies words from the prompt or is blank. (IBT Independent writing). | | | |
| | <u>Brevity</u> -is unfocused and rambling. (Online material 2) -lacks paragraph(s); points are only enumerated, rather than formulated as sentences. (Online material 3) | | | |

Appendix F: Rationales behind the criteria of the two rating scales

1. Criteria of the two rating scales:

Global structure (rhetorical moves)

Move: presence, proportion, sequence, and coherence

Content: accuracy, effectiveness

Local structure (lexico-grammatical patterns)

Language use: accuracy (lexico-grammatical use), appropriateness (vocabulary range, syntactic variety, hedging and booster use) (Jargons are excluded from scoring, taken from the writing prompt)

Brevity: conciseness, cohesiveness (as paragraph(s))

2. Rationales behind the criteria under the global move scale

How do I define move presence?

Coding scheme was adopted from Swales & Feak (2009):

Background-Purpose-Method-Results-Conclusion

Obligatory moves were adopted from Pho's (2008) definition:

Purpose-Method-Results. Hsieh and Liou's (2008) definition was referred as well:

Purpose-Method-Results-Conclusion was referred as well, but move of *Conclusion* was not listed as the obligatory here to give more freedom to write.

Why do I include move proportion and sequence?

Hsieh and Liou (2008, p 34): There were four problematic phenomena in the CPA corpus (conference proceeding abstracts) that attracted our attention (see Table 3): **(a) inverted move sequence, (b) missing obligatory moves, (c) disproportional abstracts**, and (d) outlining information in a move. Although similar phenomena were observed in both corpora, the CPA corpus generally contained a greater number of instances of them.

Hsieh and Liou (2008, p 30): Dos Santos (1996) examined the features of 94 published RA abstracts and pointed out the apparent mismatch between recommendations in the technical writing textbooks and the ways in which writers compose their articles. Dos Santos found three major genre-specific features: **(a) the size of textual space allocated for each move (move balance)**, (b) the blending of moves into the same statement (move embedding), and **(c) the reversed sequence of moves (move reversal)**.

Swales and Feak (2004, 2009, 2010) also mention the importance of sequence and proportion to move composing in abstracts of research articles. (2010, p 176, "I have

made sure that the method move is not too long.”)

Why do I include move coherence?

Coherence is a key indicator for good writing.

Why do I include content accuracy and effectiveness?

Respond to the present task that asks for an English abstract written according to a prompt of the accompanying research articles. Also, abstract is expected to present a succinct summary of the accompanying research article (Pho, 2008; Swales & Feak, 2004, 2009).

3. Rationales behind the criteria under the local pattern scale

Why do I include accuracy of language use?

Accuracy of language use is a key indicator for good writing.

Why do I include appropriateness of language use?

Vocabulary range and syntactic variety are key features for good writing. Hedging and booster are key features in conventions of academic writing. (Hyland, 2000)

Why do I include conciseness?

Respond to the present task that consists of a word limit (150-200 words). Reflect brevity that is usually expected in the writing style of abstracts of research articles. (Pho, 2008; Swales & Feak, 2004, 2009).

Why do I include cohesiveness (as paragraph(s))?

Respond to the present task that asks for a piece of abstract (一篇摘要). Cohesiveness is a key indicator for good writing.

Appendix G: The global move scale and the local pattern scale

| Category | Criteria |
|--|--|
| 1.1 Global Move (rhetorical moves) | <u>Move:</u> Presence, Proportion, Sequence, Coherence |
| 1.1 Global Move (rhetorical moves) | <u>Content:</u> Accuracy, Effectiveness |
| 1.2 Local Patten (lexico- grammatical patterns) | <u>Language Use:</u> Accuracy (lexico-grammatical use) Appropriateness (vocabulary range, syntactic variety, hedging & booster use) (Jargons are excluded from scoring, taken from the writing prompt) |
| 1.2 Local Pattern (lexico- grammatical patterns) | <u>Brevity:</u> Conciseness Cohesiveness (as paragraph(s)) |
| 1.1 The Global move scale | |
| Category | Descriptor |
| Score 5 | <i>An abstract at this level accomplishes all of the following:</i> |
| | <u>Move</u> All obligatory moves (moves of purpose-method-results) are present; optional moves (moves of background and conclusion) may be present Each move is distributed in a well-balanced proportion. Moves are distributed in an appropriate sequence. (e.g., background-purpose-method-results-conclusion) Moves are used to structure unity, progression, and coherence of the abstract. |
| | <u>Content</u> Research purposes, methods, and results are effectively and accurately summarized. If provided, research backgrounds and conclusions are effectively and accurately summarized. |

| Category | Descriptor |
|-----------------|---|
| Score 4 | <i>An abstract at this level mostly accomplishes all of the following:</i> |
| | <p><u>Move</u> All obligatory moves are present (moves of purpose-method-results); optional moves (moves of background and conclusion) may be present. Each move is distributed in a balanced proportion. One move may be out of sequence or has minor problems. Moves are used to structure unity, progression, and coherence of abstracts, though it may contain occasional redundancy, digression, or unclear connections.</p> |
| | <p><u>Content</u> Research purposes, methods, and results are effectively and accurately summarized, but some points are not completely clear. If provided, research backgrounds and conclusions are accurately summarized, but some points are not completely clear.</p> |
| Category | Descriptor |
| Score 3 | <i>An abstract at this level is marked by some of the following:</i> |
| | <p><u>Move:</u> All obligatory moves are present; optional moves may be present. Moves exhibit few problems, such as disproportion (e.g., too much in background or method), underdevelopment, or being out of logical sequence. Moves are used to display unity, progression, and coherence, though connection of ideas may be occasionally obscured.</p> |
| | <p><u>Content</u> Research purposes, methods and results are understandably summarized, but some points are irrelevant, omitted, or imprecise. If provided, research backgrounds and conclusions are understandably summarized, but some points are irrelevant, omitted, or imprecise.</p> |
| Category | Descriptor |
| Score 2 | <i>An abstract at this level reveals many of the following:</i> |
| | <p><u>Move:</u> One obligatory move is missing or underdeveloped; optional moves may be present Moves exhibit some problems such as disproportion (e.g., too much in background or method), underdevelopment, or being out of logical sequence. (e.g., background-purpose-method-results-conclusion) Moves are used with inadequate organization and connections of ideas.</p> |

| | |
|------------------------------------|--|
| | <p><u>Content</u> Research purposes, methods, and results are inadequately summarized, and some points are irrelevant, omitted, or imprecise. If provided, research backgrounds and conclusions are only summarized in a limited way, and some points are irrelevant, omitted, or imprecise.</p> |
| Category | Descriptor |
| Score 1 | <i>An abstract at this level is seriously flawed by revealing the following weaknesses:</i> |
| | <p><u>Move</u> Two obligatory moves are missing or underdeveloped; optional moves may be present. Moves exhibit major problems, such as disproportion (e.g., too much in background or method), underdevelopment, or being out of logical sequence. Moves are used with serious disorganization.</p> |
| | <p><u>Content</u> Research purposes, methods and results are summarized in a vague and wordy manner, but most points are irrelevant, omitted, or imprecise. If provided, research backgrounds and conclusions are summarized in a vague and wordy manner, and most points are irrelevant, omitted, or imprecise.</p> |
| Category | Descriptor |
| Score 0 | <i>An abstract at this level is seriously flawed and barely comprehensible by revealing the following weaknesses:</i> |
| | <p><u>Move</u> Optional moves may be present; three obligatory moves are completely missing or underdeveloped, making the abstract not connected to the topic.</p> |
| | <p><u>Content</u> Research purposes, methods, and results are incomprehensibly summarized, and a majority of points are irrelevant, omitted, or imprecise. If provided, research backgrounds and conclusions are incomprehensibly summarized, and a majority of points are irrelevant, omitted, or imprecise.</p> |
| 1.2 The Local pattern scale | |
| Category | Descriptor |
| Score 5 | <i>An abstract at this level accomplishes all of the following:</i> |
| | The abstract |
| | <p><u>Language Use</u> -demonstrates consistent facility of language use in terms of syntactic variety, appropriate word choice, and idiomaticity (jargons are excluded from scoring). -may have minor lexical or grammatical errors</p> |

| | |
|-----------------|---|
| | -displays perfectly appropriate use of hedging and booster |
| | <u>Brevity</u> -demonstrates sophisticated clarity and conciseness. -has highly-cohesive paragraph(s). |
| Category | Descriptor |
| Score 4 | <i>An abstract at this level mostly accomplishes all of the following</i> The abstract |
| | <u>Language Use</u> -demonstrates syntactic variety and range of vocabulary(jargons are excluded from scoring) -may have occasional noticeable minor errors in structure, word form, or use of idiomatic language that do not interfere with meaning -displays highly appropriate use of hedging and booster |
| | <u>Brevity</u> -demonstrates satisfactory clarity and conciseness. -has generally cohesive paragraph(s), though some points are merely enumerated in the text. |
| Category | Descriptor |
| Score 3 | <i>An abstract at this level is marked by some of the following:</i> The abstract |
| | <u>Language Use</u> -demonstrates inconsistent facility in the use of syntactic variety and word choice (jargons are excluded from scoring), resulting in occasional lack of clarity and obscure meaning -has noticeable minor errors in structure, word form, or use of idiomatic language -demonstrates partially appropriate use of hedging and booster |
| | <u>Brevity</u> -demonstrates clarity and conciseness. -has some cohesive paragraph(s), yet some points are merely enumerated, rather than formulated as sentences. |
| Category | Descriptor |
| Score 2 | <i>An abstract at this level reveals many of the following:</i> The abstract |
| | <u>Language Use</u> -has a noticeably inappropriate choice of words or word forms -has an accumulation of errors in sentence structure and/or language usage -has a noticeably inappropriate use of hedging and booster |

| | |
|-----------------|--|
| | <u>Brevity</u> -demonstrates limited clarity or conciseness. -has some disorganized and incoherent paragraph(s), and some points are merely enumerated, rather than formulated as sentences. |
| Category | Descriptor |
| Score 1 | <i>An abstract at this level is seriously flawed by revealing the following weaknesses:</i> The abstract |
| | <u>Language Use</u> -has serious and frequent errors in language usage, and without hedging and booster |
| | <u>Brevity</u> -lacks clarity or conciseness. -has several disorganized and incoherent paragraph(s), and most points are merely enumerated, rather than formulated as sentences. |
| Category | Descriptor |
| Score 0 | <i>An abstract at this level is seriously flawed and barely comprehensible by revealing the following weaknesses</i> The abstract |
| | <u>Language Use</u> -merely copies words from the prompt or is blank. |
| | <u>Brevity</u> -is unfocused and rambling. -lacks paragraph(s); points are only enumerated, rather than formulated as sentences. |

**Appendix H: An RA-abstract writing composed in the formal study
(move-coded)**

//P// The purpose of this study is to investigate the effects of implementing text-based asynchronous discussion in one content-based English course. //M// Participants included 41 college students majoring in applied English in 2004, 35 students respectively in 2005 and 2006. Over the course of instruction, they were further grouped into 8 to 11 members, and required to discuss and respond to others' comments every other week. Collected data include discussion exchanges, 5-point-Likert-scale questionnaires, as well as group interviews. //R// Results generally show learners' positive perceptions toward asynchronous discussion. Learners indicated that their comprehension of the course content was facilitated, and that their English reading and writing ability improved. As for factors that contribute to high degree of interaction during discussion, it was shown that the style of group leadership, the performance of peers, the styles of elicitation/responding, and concerns over grades all played a role. //C// Pedagogical implications were delineated, in an aim to shed light on how asynchronous discussion can be better implemented in language learning and teaching.

Appendix I: Item analysis on the five subscales of IWMI in the formal study

Descriptive Statistics of the Interest Value Subscale

| Item | <i>M</i> | <i>SD</i> | Corrected Item-sum Correlation | Cronbach's alpha when an item deleted |
|------|----------|-----------|--------------------------------------|--|
| 12 | 2.84 | .918 | .765* | .881 |
| 14 | 2.76 | .913 | .705* | .894 |
| 16 | 2.25 | .882 | .786* | .877 |
| 18 | 2.74 | .897 | .810* | .871 |
| 20 | 2.71 | .896 | .730* | .888 |

Note. *N*=185. Cronbach alpha for the entire subscale=.90. **p* < .05.

Descriptive Statistics of the Utility Value Subscale

| Item | <i>M</i> | <i>SD</i> | Corrected Item-sum Correlation | Cronbach's alpha when an item deleted |
|------|----------|-----------|--------------------------------------|--|
| 13 | 4.28 | .742 | .660* | .827 |
| 15 | 3.50 | .984 | .687* | .819 |
| 17 | 3.90 | .898 | .716* | .809 |
| 19 | 4.01 | .903 | .651* | .827 |
| 21 | 3.89 | .834 | .632* | .832 |

Note. *N*=185. Cronbach alpha for the entire subscale= .85. **p* < .05.

Descriptive Statistics of the Cost Subscale

| Item | <i>M</i> | <i>SD</i> | Corrected Item-sum Correlation | Cronbach's alpha when an item deleted |
|------|----------|-----------|--------------------------------------|--|
| 22 | 2.52 | 1.053 | .611* | .790 |
| 24 | 2.81 | 1.049 | .554* | .808 |
| 26 | 2.36 | 1.000 | .696* | .764 |
| 28 | 1.94 | 0.784 | .570* | .803 |
| 30 | 2.29 | 0.961 | .674* | .771 |

Note. *N*=185. Cronbach alpha for the entire subscale= .82. **p* < .05.

Descriptive Statistics of the Connectedness Value Subscale

| Item | <i>M</i> | <i>SD</i> | Corrected Item-sum Correlation | Cronbach's alpha when an item deleted |
|------|----------|-----------|--------------------------------------|--|
| 23 | 3.96 | .820 | .583* | .765 |
| 25 | 3.76 | .821 | .615* | .755 |
| 27 | 3.99 | .744 | .652* | .747 |
| 29 | 4.05 | .839 | .570* | .769 |
| 31 | 3.55 | .926 | .525* | .786 |

Note. *N*=185. Cronbach alpha for the entire subsale= .80. **p* < .05.

Descriptive Statistics of the Ability Self-concept Subscale

| Item | <i>M</i> | <i>SD</i> | Corrected Item-sum Correlation | Cronbach's alpha when an item deleted |
|------|----------|-----------|--------------------------------------|--|
| 32 | 3.50 | .745 | .657* | .826 |
| 33 | 4.08 | .744 | .535* | .853 |
| 34 | 2.66 | .844 | .751* | .799 |
| 35 | 2.48 | .873 | .757* | .797 |
| 36 | 2.83 | .932 | .642* | .831 |

Note. *N*=185. Cronbach alpha for the entire subsale= .85. **p* < .05.

Appendix J: Item analysis on the three subscales of SWSI in the formal study

Descriptive Statistics of the Cognition Regulation Subscale

| Item | <i>M</i> | <i>SD</i> | Corrected Item-sum Correlation | Cronbach's alpha when an item deleted |
|------|----------|-----------|--------------------------------------|--|
| 37 | 4.14 | .716 | .406* | .842 |
| 38 | 3.64 | .817 | .093* | .857 |
| 39 | 3.81 | .770 | .321* | .846 |
| 40 | 4.12 | .781 | .328* | .845 |
| 41 | 4.16 | .749 | .392* | .842 |
| 42 | 4.23 | .717 | .598* | .833 |
| 43 | 4.21 | .731 | .604* | .833 |
| 44 | 4.16 | .716 | .603* | .833 |
| 45 | 4.11 | .725 | .587* | .834 |
| 46 | 3.52 | .848 | .398* | .842 |
| 47 | 3.78 | .884 | .452* | .840 |
| 48 | 3.89 | .887 | .497* | .837 |
| 49 | 4.08 | .706 | .580* | .834 |
| 50 | 3.89 | .729 | .622* | .832 |
| 51 | 3.54 | .807 | .408* | .842 |
| 52 | 3.72 | .790 | .437* | .840 |
| 53 | 3.97 | .878 | .390* | .843 |
| 54 | 3.84 | .761 | .431* | .841 |

Note. *N*=185. Cronbach alpha for the entire subscale=. 85. **p* < .05.

Descriptive Statistics of the Motivation Regulation Subscale

| Item | <i>M</i> | <i>SD</i> | Corrected Item-sum Correlation | Cronbach's alpha when an item deleted |
|------|----------|-----------|--------------------------------------|--|
| 55 | 3.04 | 0.983 | .281* | .817 |
| 57 | 3.17 | 1.142 | .447* | .800 |
| 59 | 3.27 | 1.001 | .480* | .795 |
| 61 | 3.06 | 1.121 | .536* | .788 |
| 63 | 3.33 | 1.135 | .571* | .784 |
| 66 | 2.97 | 1.200 | .610* | .778 |
| 68 | 3.65 | 0.978 | .442* | .800 |
| 70 | 3.21 | 1.080 | .563* | .785 |
| 72 | 3.12 | 1.131 | .616* | .778 |

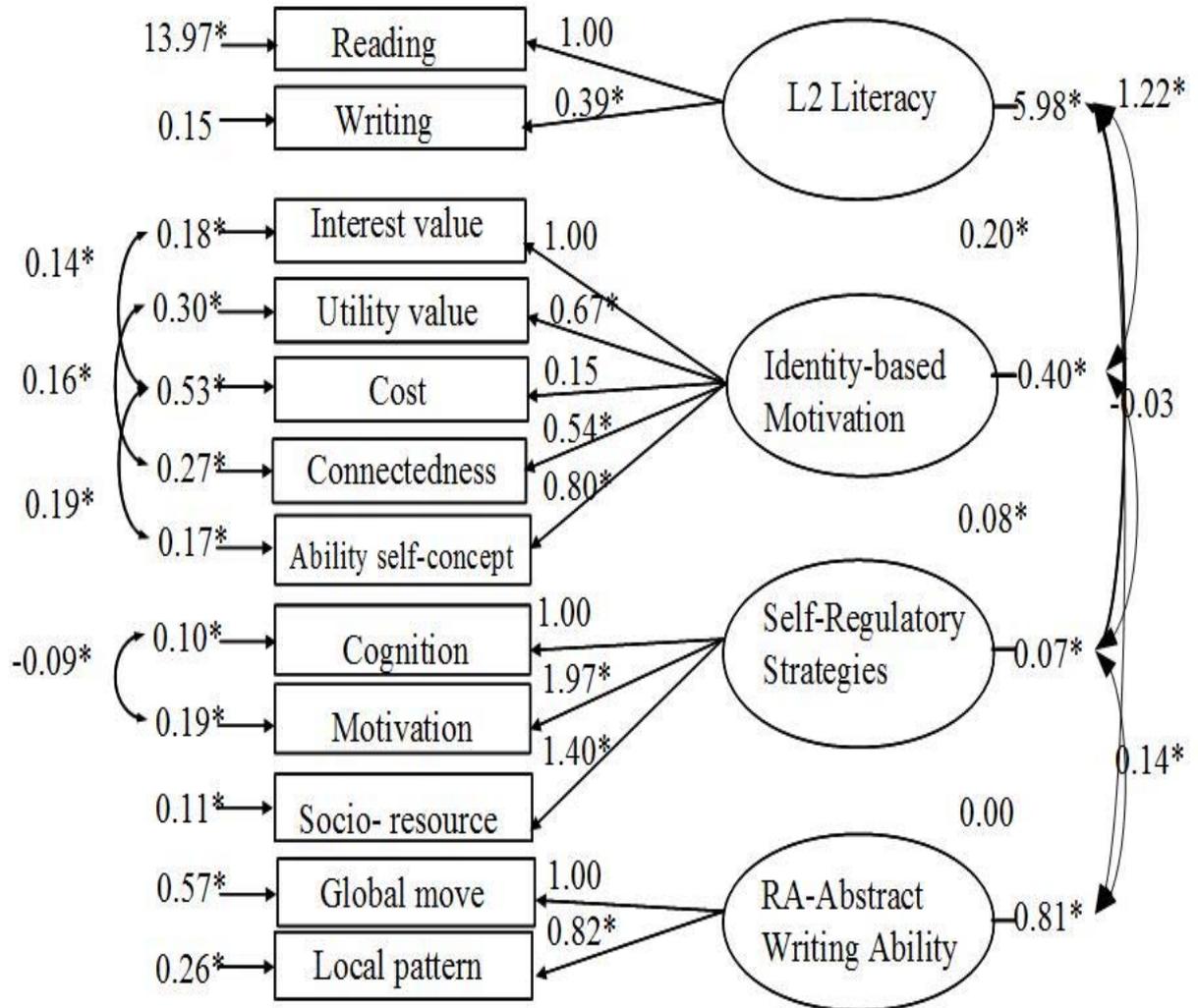
Note. *N*=185. Cronbach alpha for the entire subsale=.81. **p* < .05.

Descriptive Statistics of the Socio-interactive Regulation Subscale

| Item | <i>M</i> | <i>SD</i> | Corrected Item-sum Correlation | Cronbach's alpha when an item deleted |
|------|----------|-----------|--------------------------------------|--|
| 56 | 4.02 | 0.811 | .281* | .752 |
| 58 | 4.10 | 0.811 | .359* | .745 |
| 60 | 3.48 | 0.984 | .513* | .727 |
| 62 | 3.64 | 0.817 | .412* | .740 |
| 64 | 2.65 | 1.058 | .358* | .746 |
| 65 | 3.37 | 1.091 | .478* | .730 |
| 67 | 4.42 | 0.755 | .236* | .756 |
| 69 | 3.36 | 1.095 | .443* | .735 |
| 71 | 3.82 | 0.818 | .285* | .752 |
| 73 | 2.97 | 0.994 | .430* | .737 |
| 74 | 3.06 | 1.033 | .447* | .734 |
| 75 | 3.31 | 1.264 | .442* | .736 |

Note. *N*=185. Cronbach alpha for the entire subsale=.76. **p* < .05.

Appendix K: The measurement model of the MAW model in the un-standardized solution



Appendix L: The structural model of the MAW model in the un-standardized solution

