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EMPIRICAL INVESTIGATIONS ON BILINGUAL MENTAL LEXICON AND ENGLISH LEARNING FOR CHINESE L2 LEARNERS

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传真:(023) 65103686 65105565
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内容简介

本书反映的是中国学习者双语心理词汇和英语学习实证研究的最新成果。全书的内容涉及心理词汇提取和英语学习两大部分；前一部分主要围绕我国英语学习者心理词汇的表征和提取问题；后一部分主要针对英语学习的难点和热点问题（如英语空间介词的学习，伴随性词汇习得和焦虑问题）和英语学习过程中普遍关注的问题（如学习策略的使用问题）。

第一章研究的是在两种不同词汇提取任务中工作记忆容量对英语学习者跨语言竞争是否有抑制作用。第二章考察公式化语言的频率以及学习者的语言水平对公式化语言在二语心理词汇中的表征作用。第三章主要从原型理论和中心—边缘意义的角度探究在空间意义方面 over 的核心意义与学习者使用 over 一词的空间意义之间是否存在相关性。第四章考察了空间认知理论中功能几何法对学习英语空间介词 in 和 on 的促进作用。第五章研究了不同的加工条件对我国小学生英语词汇附带习得的影响。第六章着重调查了大学一年级新生记忆策略的使用情况，以及性别、专业和英语水平对记忆策略使用的影响；第七章则研究了学习策略与阅读成绩的相关性，以及不同的阅读水平对策略使用的影响。第八章对使用录音法来降低学习者在口语课中产生的焦虑所起到的作用进行了探索，同时还研究了录音法对口语流利度的促进作用。

愿此书对我们的读者有所启发，愿它能引起更多人对英语学习的思考和关注。

Preface

This book is the outcome of over 5 years of research into bilingual mental lexicon and English learning for Chinese L2 learners. It represents a collaborative effort to shed light on central but not much studied research issues in bilingual mental lexicon in China. It also aims to reveal some interesting aspects of second language acquisition by providing relevant empirical evidence. Therefore, it does not intend to cover current knowledge or general principles, unless they are relevant to the issues examined, which are dealt with in detail in the literature.

As Susan Gass and Larry Selinker (2001) commented, the field of second language acquisition is concerned with the general question: How are second languages learned? This broad research focus marks its noteworthy interdisciplinary character. Researchers and scholars approach this field from a wide range of perspectives: psychological, linguistic, and educational, to name a few. The interdisciplinary character is also reflected in the studies covered in this book.

These topics are explored in the succeeding chapters. Chapter 1 explores the control function of working memory capacity by observing its effects on Chinese-speaking English learners' performance in a picture naming task and a picture-word interference task. Chapter 2 extends the issue whether formulaic sequences can be stored and retrieved holistically in the L2 mental lexicon. It investigates the effects of frequency and language proficiency on the representation of formulaic sequences in the L2 mental lexicon. Chapter 3 centers on the learning of English spatial prepositions in general and exams the learning of English spatial proposition *over* in particular. It explores the correlation between Chinese EFL learners' use of the spatial preposition *over* and the centralness of spatial meanings of the word. Chapter 4 also tackles the learning of English spatial prepositions. It aims to reveal whether functional

geometric analysis is more desirable to the learning of English spatial prepositions *in* and *on* for Chinese EFL learners. Chapter 5 looks into the issue of incidental vocabulary learning and it examines the role of different processing levels on Chinese pupils' English incidental vocabulary acquisition in the process of listening comprehension. Chapter 6 addresses the issue of memory strategy use in English learning among Chinese college students. More specifically, this study attempts to examine memory strategy use of university students and to reveal any differences in memory strategy use between sex, proficiency levels and across majors. It further explores the correlation between memory strategy use and academic achievements of those learners. Chapter 7 studies the correlation of learning strategies with English reading proficiency and discovers the difference in terms of strategy use across three different reading proficiency levels of Chinese college students. Chapter 8 considers a practical proposal to reduce anxiety in classroom speaking activities. It examines whether recording is capable of reducing anxiety in oral English class, and to analyze in what ways recording can promote speaking in English for Chinese EFL learners.

Hopefully, the findings generated from the empirical research offer insights into the cognitive and affective aspects of English learning in Chinese EFL context.

The following is a list of people who participated in the empirical studies and the preparation for the manuscripts of this book: Zhang Fenghui for Chapter 1; Miao Daorong for Chapter 2; Fan Jinling for Chapter 3; Li Xiaomei for Chapter 4; Tian Qiuxiang for Chapter 5; Sai Dan for Chapter 6; Tian Qinjian for Chapter 7 and Niu Shujie for Chapter 8. Zhang Lei and Miao Zhenfang participated in the revision of the references. I wish to thank them for their great contribution to this book. I also wish to thank College of Foreign Languages, Chongqing University, which funded four of the studies and supported the publishing of this book.

Li Hong

at Sha Ping Ba, Chongqing, China

2007/07/07

Contents

Chapter One

Cross-language Competition in Bilingual Semantic Processing: an Investigation on the Non-effects of Working Memory Capacity[1]

1. Introduction

1.1 General description of the study

The study of bilingual mental lexicon has now become a major concern in second language acquisition and psycholinguistic research. Cross-language competition is generally accepted and frequently observed as a common occurrence in bilingual processing. Researchers have attempted to explore the organization and representation of bilinguals' mental lexicon in search of fundamental mechanism of the competition that exists between two languages. However, no breakthrough has been achieved by restricting the research work to study of the lexicon system itself. Efforts have been made to investigate bilingual processing from psycholinguistic perspectives.

Researchers have conducted a lot of studies on the organization and representation of bilingual mental lexicon. By looking into many kinds of language task performance of bilinguals at different stages or levels, they came to an agreement that bilingual mental lexicon organization and representation, with its semantic and lexical representation as basic components, may tend to display differences at different developing stages and representational levels.

1 This study was suppported by the research grant of 2004 ILCIP Key Project, Chongqing University. It was also supported by Chongqing Education Commisson Social Science Research Project (No. 07sk159).

The non-selective retrieval hypothesis has been supported by a lot of evidence, and it is generally assumed that lexicons in two languages are activated and compete for retrieval. Then the myth how bilinguals successfully achieve the desired language task under such cross-language competition becomes a key issue in understanding bilingual processing and in turn corroborating the current proposal on the organization and representation of bilingual lexicon.

Working memory, as a general cognitive ability, has been considered highly relevant to language learning. Researchers in psycholinguistics are now more aware of the potential effect of working memory on language learning proficiency and the realization of various language tasks. The central executive, as the control system of working memory, is proposed to serve a function of control over bilingual language tasks when competition between two languages increases processing load. However, it is a difficult question whether bilingual tasks of all kinds would call for the control function of working memory and how this functioning may mediate task performance.

Therefore, the focus of this chapter is to investigate the control function of working memory capacity by observing its effect on the performance of different experimental tasks. The working memory effect on the designated experimental tasks (namely the picture naming task and the picture-word interference task) is studied, the mediating effect of task complexity on working memory capacity effect is brought under investigation, and cross-language competition expected to occur in bilingual processing is also closely observed. It is assumed that the span effect should reveal itself in a robust manner given that cross-language competition occurs in bilingual tasks and the task complexity reaches a level for controlled processing.

In brief, the following questions are addressed in the present study:

1) Do individual differences in working memory capacity of Chinese English learners as a foreign language influence response latency and accuracy in semantic processing of picture naming and picture-word interference task?
2) How do individual differences in working memory capacity of Chinese EFL

learners affect their performance on these tasks?

3) Do differences in task complexity influence the effect of working memory capacity on semantic processing?

1.2 Definition of key terms

1.2.1 Bilingual mental lexicon

A bilingual is defined as anyone who actively uses or attempts to use more than one language. A bilingual includes those who have the knowledge of two or even more languages, who learn or use an L2 as a foreign language or as a second language, and who have the knowledge of L2 in a proficient or non-proficient manner. In the present study it actually refers to Chinese English learners as a foreign language learner. To be more exact, these groups of Chinese EFL learners involved in the present study are Chinese college English students who take English courses for credit and display poor grasp of the English language relative to English majors (also Chinese EFL learners) and native English speakers. So the bilinguals in the present study can be labeled as unbalanced bilinguals.

Aitchison (2003) offered a whole picture of mental lexicon. Mental lexicon refers to the way how words are stored in the human mind, and the way how they are organized and interconnected.

Bilingual mental lexicon (also called bilingual lexicon in the study), is the word store of a bilingual. Since bilingual mental lexicon involves two or more languages of the bilingual, his/her proficiency of each language may influence the representation of that language.

1.2.2 Cross-language competition

Cross-language competition can be defined as the activation of semantic and lexical information in both languages when online processing occurs in a bilingual. In other words, words in the two languages are activated to some extent when a language processing task is required upon a bilingual, and they may compete to be the outcome of the mental activity. This competition between the two languages is assumed to increase attentional demand and cause processing difficulty in the performance of a language task.

1.2.3 Working memory capacity

Working memory is defined as a multipartite system, composed of two slave systems (i.e. the phonological loop, and the visuo-spatial sketch pad) and a central executive (Baddley & Hitch, 1974). Working memory capacity, based on the general capacity model proposed by Engle, Cantor and Carullo (1992), is viewed as a capacity-limited memory structure not only capable of information storage and processing but also capable of task-irrelevant information suppression.

1.3 Significance of the study

Bilingualism is now a common phenomenon in the modern world where people in all nations are now attempting to learn about languages and cultures different from their own and are getting closer in the fields of commerce, culture, education, etc. To understand the underlying mechanism of bilingual processing from psycholinguistic perspective is an increasing necessity not only in the theoretical and empirical studies of bilingual mental lexicon, but also in pedagogical research. In fact, more efforts have ever been made to investigate the effect of working memory capacity on bilingual processing from psycholinguistic perspectives.

As is mentioned in Section 1.1, the study of bilingual mental lexicon in respect of its structure and organization does not suffice to provide a clear picture of how bilingual processing occurs. The mental activities involved should be clearly stated, and bilingual research should be developed from broader views, employing psycholinguistic perspectives and methods if necessary.

Working memory capacity as a general cognitive ability has long been believed to have a close relationship with language learning. The study of working memory capacity effect in monolingual research has brought many findings (Daneman & Green, 1986; Just & Carpenter, 1992), which inspired bilingual researchers to extend monolingual research into the fields of bilingual processing.

In this study, the author attempts to explore the working memory capacity effect on bilingual semantic processing, in the hope that it may generate some

findings on the effect, also on the bilingual lexicon itself.

2. Theoretical Proposals and Relevant Major Findings

2.1 Bilingual mental lexicon

2.1.1 Defining bilingual mental lexicon

Mental lexicon refers to the "human word-store" (Aitchison, 2003: 10), and the words in the store of the mind are suggested to be interconnected "in a gigantic multi-dimensional cobweb, in which every item is attached to scores of others" (Aitchison, 2003: 84). As to the organization and components of the mental lexicon, i.e., how words in the lexicon are arranged, represented, and interconnected, Aitchison (2003) held that two main components or modules, semantic-syntactic and phonetic-phonological, constitute the mental lexicon. As Li (2004: 11) explained, "the first component contains the lemmas, which refers to word meaning and word class, and the second component contains the word form, which refers to sounds, and the two components are linked to a subsidiary component called 'the lexical-tool-kit', which is responsible for creating new words". Each component or module can be seen as a multiplex network with strong links with the items within the same component and weaker links with items outside the component.

The distinction of these two networks or components has been adopted in describing sbilingual's mental lexicon, or bilingual lexicon. Bilingual researchers agree that there are two different levels of representation, namely the conceptual representations — the representation of word meaning, and the lexical representations — the representation of word form.

2.1.2 Structure of bilingual lexicon

Debate over the issue of the relations between L1 and L2 mental lexicon in bilingualism research has focused on how the representations of two lexicons are organized. That divides itself into two questions: (1) do structures of L1 and L2 lexicon integrate or stand parallel to each other? And (2) do structures of L1 and L2 lexicon follow the same or different operation principle?

For the first question, opinions split into two, i.e., the independency or

interdependency of lexical organization of bilinguals (Potter, So, Von Eckardt & Feldman, 1984). Independence model can be described as a separate storage system, which assumes that there exist two distinct systems for the lexical items of each language. This is held by early research and supported theoretically by the proposal of modularity hypothesis and formal differences between languages (Singleton, 1999) and empirically by the research of Grosjean (1982) on aphasia, which reported that a native speaker of Swiss German who had received a serious head injury later recovered his several languages one by one in a separate manner. Grainger (1994, as cited in Singleton 1999) cited a bundle of studies on the issue of how bilinguals access their L1 and L2 lexicon in their language use in an attempt to support this independency view; however, Singleton (1999: 172) concluded his reviews by stating that it seems to "imply a level at which each language is separately represented, the lexicon of each language being more or less activated by the outcomes of lexical search and according to the degree of strength of each language".

In contrast, interdependence model describes bilingual lexicon as a common storage system, which assumes that there exists one underlying representation common to each word and its translation equivalent. Cook (1992) proposed the notion of "holistic competence" in favor of L1-L2 lexical integration, and Jessner (1996, see Singleton, 1999) provided further evidence for this hypothesis. However, many researchers recently adopted the partially integrated position, i. e., languages have functionally separate store for form-based lexical representations but share a common store of conceptual representations. Kroll (1993) concluded in her study that in the bilingual lexicon the conceptual representations were shared, but the lexical representations were independent across languages. As a matter of fact, hierarchical representation models are held strong in recent studies, which distinguish representations at lexical and conceptual level, at concrete/ abstract and cognate/non-cognate level (De Groot, 1995), at different developmental level (Woutersen, 1996; Jiang, 2000), etc. It is currently

agreed that conceptual representations across the bilingual's two languages are shared though in a distributed manner.

As for the second question, i. e., about the operation principle of L1 and L2 lexicon, the studies varied and confounding proposals came out of a lot of findings. Basically, they agreed on the same or different operation principle respectively. Meara (1984, see Singleton, 1999), based on his word association tests, considered that the results of these tests revealed that the structure of L2 mental lexicon was quite different from that of L1 mental lexicon in that L2 lexicon was phonologically-linked in nature while L1 lexicon was semantically-linked in nature. Singleton (1999) reviewed Meara's study, and other studies by Söderman (1989, 1993, see Singleton, 1999), Laufer (1997), etc., and concluded that the studies confirmed the view that "the operation of the L2 mental lexicon closely resembles that of the L1 mental lexicon and that the 'phonological factor' is not peculiar to L2 lexical processing, but is prominent in the early stages of dealing with particular lexical items in both L1 and L2" (Singleton, 1999: 151). L2 mental lexicon is not only phonologically-linked, but semantically-linked, and the semantic links strengthen with the degree of integration of words into L2 mental lexicon (Singleton, 1999).

The revised hierarchical model (or RHM) proposed by Kroll and Stewart (1994) is an often cited hypothesis on the representation of lexical and conceptual levels of bilingual lexicon. It described the "developmental shift" in the links between lexicons of two languages. The model assumed that the connections between words and concepts in bilingual memory change with increasing proficiency in the L2; the connections were marked with different weight for different proficiency level and for different directions of connections, and revealed asymmetry in the representation. Later researches (Talamas et al., 1999; Kroll et al., 1998; Dufour et al., submitted) on translation asymmetry predicted by the revised hierarchical model provided converging evidence for the proposal.

However, the design of experimental tasks of conceptual processing may

mediate the research findings. Tasks involving conceptual mediation, such as lexical decision task, may produce results different from tasks involving lexicalization, such as translation which has been mentioned above. Conceptual mediation and lexicalization involve different processing level and therefore may generate different findings. Studies with the design of conceptual mediation tasks (Altarriba & Mathis, 1997; Frenck-Mestre & Prince, 1997) appeared to converge on the conclusion that even less fluent bilinguals were sensitive to semantic relations to some extent and were able to access semantic information, modifying the proposal of the RHM that early second language learners solely relied on lexical connections in language processing in the L2-L1 direction. Many studies added other aspects, such as word concreteness, availability of alternative translation equivalents, cognates, etc.

In sum, the studies referred to in this section tend to get to a conclusion that L1 lexicon and L2 lexicon in a bilingual's mind are by no way separated, unrelated or dissimilar to each other. They may have access to a common conceptual representation to an extent, and the internal structures of representation resemble each other, but the extent of access to conceptual representation and the similarity of internal structure within L1 and L2 lexicon may alter with the proficiency level of each language. And the way mental lexicon is organized and represented may reveal itself in the processing of a bilingual's lexicon. In the following section, the author reviewed studies of bilingual processing and went for the notion that words in the bilingual's two lexicons are always active and compete for selection/retrieval.

2.1.3 Processing of bilingual lexicon

As has been mentioned in the previous section, the lexical and semantic representations of L1 and L2 lexicon display similar features but adapt to the development of the lexicons. Generally speaking, the two lexicons share one common conceptual system and the links between lexical and semantic representations exhibit an asymmetrical and dynamic nature.

As the two lexicons are always connected at different levels, and a

bilingual has two languages at his/her disposal when faced with a language task, some problems naturally follow: 1) How is the semantic and lexical information of each lexicon activated? 2) How is the targeted output retrieved? Two contrasting views were proposed and tested in many studies. According to the language-specific selection view, only words of the target language are considered for lexical selection and can compete for selection (see Costa et al., 1999; Hermans et al., 1998). In contrast, the language-nonspecific selection view holds that words in both languages are activated and compete for retrieval (Costa et al., 2000; Marian & Spivey, 2003; Van Heuven et al., 1998). The Bilingual Interaction Activation model was a model proposed to account for the language-independent selection pattern observed in bilingual processing (Van Heuven et al., 1998).

The Bilingual Interactive Activation model

The Bilingual Interactive Activation model proposed by Van Heuven et al. (1998) extended the interactive activation model by McCelland and Rumelhart (1981, see Kroll & Sunderman, 2003) in a bilingual dimension.

The BIA model claimed "that the bilingual's lexicon is integrated and that lexical access is non-selective, with candidates in both languages activated whenever the input shares feature with alternatives in either language" (Kroll & Sunderman, 2003: 106). It assumed that when orthographic input was received by a bilingual speaker, lexical information in both languages is activated in parallel and then compete for retrieval. Specifically, the underlying mechanism in interpreting the cross-language effects was put as follows:

> When a string of letters is presented to the BIA model, this visual input affects particular feature at each letter position, which subsequently excite letters that contain these features and at the same time inhibit letters for which the features are absent. The activated letters next excite words in both languages for which the activated letter occurs at the position in question, while all other words inhibit each other, irrespective of the language to which they belong. Activated word nodes send excitatory feedback to their constituent letters. Activated word nodes from the same language also send activation on to the corresponding language node, while activated language nodes send