

**Effects of L2 Vocabulary Acquisition on
L1 Performance: Evidence from
Form-Meaning Mapping between
Chinese and Japanese**



Examination Number: B003380

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2011

Declaration

I have read and understood The University of Edinburgh guidelines on Plagiarism and declare that this written dissertation is all my own work except where I indicate otherwise by proper use of quotes and references.

(Anchises Yu-Han Lu)

Acknowledgements

I am grateful to my family and friends who gave their support from time to time. I would like to thank Mits Ota for his continued advice, as well as Catherine Dickie for her patient work. Special thanks to Yi-Ling Liu, Yi-Lu Lu and the participants for allowing me to use their time to conduct the experiment. Finally, I would like to thank all the people not being mentioned above who have helped me to complete this work.

List of Abbreviations

ESL	English as a Second Language
L1	First Language
L2	Second Language
LT	Language Teaching
RT	Response Time
SLA	Second Language Acquisition
UG	Universal Grammar
VOT	Voice Onset Time

Abstract

The present study investigates backward transfer (the influence of L2 knowledge on L1 performance) at the lexical level through the semantic gap between Chinese and Japanese words sharing the same orthographic presentation. The Chinese (L1) competence of 79 Taiwanese students with or without experience of Japanese (L2) learning was recruited for a form-meaning mapping task with an exclusively native language context. The task asked the participants to rate the degree of semantic appropriateness of three options corresponding to each orthographic word. There were 24 orthographic words in total and each word came with one Chinese meaning, one Japanese meaning, and one novel meaning for the semantic appropriateness rating. Compared to the students with no or minimal Japanese experience, the students with Japanese experience were found to provide higher rating scores for the Japanese meanings corresponding to the orthographic words in the exclusively Chinese context. The results indicate that the L1 lexical performance of those students who know Japanese had been affected by their L2 vocabulary acquisition, which was interpreted as strong evidence in support of the existence of the cross-language influence of an L2 on the L1.

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1 Introduction

1.1 Background

The topic of lexical transfer has been one of the noteworthy dimensions in the study of cross-language influence since the 1950s and 1960s when scholars such as Weinreich (1953) started to notice the existence of language transfer. Much research has looked at the role of first language (L1) lexicon in second language (L2) vocabulary acquisition for the sake of proving the existence of L1 transfer (Arabski, 2006; Jiang, 2000, 2002; Green 1998; Ringbom, 1987). As more and more evidence has been revealed, language transfer appears to be a bidirectional phenomenon—a newly acquired language may also influence a learner's native language (Pavlenko and Jarvis, 2002). The term *backward transfer* (or reverse transfer) is used to indicate instances where the L1 or some previously learned language is found to be affected by elements of an L2 or any additional language. The question arises as to how and to what extent backward transfer is implicated in L2 users' lexical performance in the L1.

Compared to the amount of research into the effects of L1 on L2, the influence that an L2 has on its learners' L1 has hardly been investigated. There may be two main reasons for this neglect. First, it may be because the influence of an L2 on the L1 is less detectable, or because the L1, as a matured language system, is no longer being expected to change. The foreign accents that can be often heard in an L2 confirm the common belief that the native language has influence on a newly acquired language. Although an English native speaker can guess whether someone is Japanese or French by their foreign accent, it needs sophisticated instrumental analysis of Spanish speech by a native Spanish speaker to tell whether the speaker also knows English (Cook, 2003). The other possible explanation is based on the fact that for a long time the implications of much research on language transfer has been heavily

weighted in the direction of the second language acquisition (SLA) perspective. At the beginner's stage of SLA, language transfer is mostly unidirectional, from L1 to L2. Many advanced learners who have supplied data for research on language transfer were immigrants to an L2 speaking country where L2 knowledge was vital for their integration into the new environment. Thus, the needs for successful SLA prompted researchers to take an interest in the avoidance of the cross-language influence of the L1 on the L2 (Laufer, 2003). As a result, the state of the native language has not raised the same amount of interest even though backward transfer, as forward transfer, has a wide range of contributions to research on cross-language influence in the fields of SLA and language teaching (LT)—research on language transfer would not be complete unless sufficient studies in backward transfer was carried out. Moreover, the understanding of backward transfer may help to improve L1 performance related to an L2, such as to translate L2 contexts into the L1. More evidence is still needed to support the existence of backward transfer and to provide a better understanding of this topic for academic, pedagogical, and pragmatic purposes.

To provide evidence in support of the presence of backward transfer, the present study looks at the semantic gap between Chinese and Japanese words sharing the same orthographic representation. In Japanese, there are three types of symbols which are mixed and used in the language. The type which is of particular importance for the present study is pictographic-ideographic characters, adopted from Chinese characters, which are mainly used for conceptual parts of speech and indigenous names. Although the borrowing of Chinese characters dates back to at least the sixteenth century, the Chinese characters currently used in Japanese do not differ markedly from those used in the Chinese language in the present (Hadamitzky and Spahn, 1997). On the other hand, the meaning of a Japanese word which has the same, or at least similar, orthographic representation with its corresponding Chinese word

may not always be identical to the Chinese meaning. When there is semantic gap between Chinese and Japanese words sharing the same Chinese characters, normally it is easy to see language transfer resulting from such divergence.

It has been suggested that the mental lexicon of a bilingual is organized on the basis of item characteristics; words with the same lexical representation in the two languages might activate the bilingual's lexicon in response to both languages (*language non-selective access*, see Van Hell and Dijkstra, 2002). To take this view to an extreme, this would imply that meanings from both Chinese and Japanese are activated when a Chinese-Japanese bilingual reads a word which has the same orthographic form in the two languages, even when the word is read either in a purely L1 or a purely L2 context. In other words, the bilingual is likely to be momentarily confused about the meaning of a word which shares the same orthography but falls in the semantic gap between Chinese and Japanese. An incorrect form-meaning mapping would thus appear because of the confusion about the word meaning. Much research has discovered such cross-language influence on meaning confusions in either Chinese or Japanese form-meaning mapping caused by the semantic gap (Otsuka 大塚 and Lin, 2010; Shao 邵, 2005; Takeda 竹田, 2005; Zhang 張, 2010). However, most researchers have interpreted their discovery of language transfer across Chinese and Japanese as a unidirectional phenomenon: from L1 to L2. There is so far little evidence that indicates such transfer also holds for the reverse situation: the lexical knowledge in L2 has an influence on L1 performance. Therefore, the present study investigates the semantic gap between Chinese and Japanese words that share identical orthographic representation to ascertain whether there is evidence in support of backward transfer, a slightly different research question. Here, the research question arises as to how and to what extent the gap between Chinese and Japanese meanings of words with the same orthography may cause backward transfer.

1.2 Aim of the Dissertation

The aim of the present study is twofold. One aim is to obtain evidence of backward transfer at the lexical level that results from the semantic gap between Chinese and Japanese words with identical orthography in the processing of form-meaning mapping. The other aim is to use the results to further the discussion of related topics in the field of SLA, and to apply the results for pedagogical/pragmatic purposes.

As mentioned earlier, although much research has been devoted to the question of cross-language transfer, the amount of research on backward transfer is still limited. Through the process of the current research, it is hoped to shed light on the specificities of Chinese and Japanese in terms of cross-language influence (for example, the formal-semantic overlap between Chinese and Japanese words). Also, the present study attempts to provide a better understanding of transfer at the lexical level. Apart from obtaining evidence for backward transfer, the experiment of the current research can be seen as an examination of some SLA theories of cross-language influence, such as the language-nonspecific access account. Finally, considering the population of students who are learning Chinese/Japanese¹, to conduct an investigation into the language transfer across Chinese and Japanese must have its importance to teachers and students of the two languages. The results of the current research

¹ Due to geographical and historical reasons, Taiwan is generally thought to be culturally, economically and linguistically close to its neighbour country Japan. Many Taiwanese users of Japanese language began to learn Japanese as an L2 for their own interests, for vocational needs or because of its ease of acquisition (since Japanese contains a remarkable number of Chinese characters); these were the main reasons given for their learning of Japanese (Morinishi 森西 and Fujii 藤井, 2003). According to the Interchange Association (Japan), in 2010, there were 247,641 Taiwanese students learning Japanese over all the educational institutions in Taiwan (not including Taiwanese learners of Japanese who were studying overseas at that time), which means that one in every 93.4 Taiwanese was learning Japanese. The proportion of the population which was Japanese-learning in Taiwan was ranked third (after Korea and Australia) around the world.

will be extended and its aim is to provide some discussion for pedagogical and pragmatic purposes.

1.3 Structure of the Dissertation

The body of this paper is organized into four sections. I devote the first section to a literature review which starts with an overview of language transfer and a more specific discussion of backward transfer on the basis of the bidirectionality of language transfer. This is followed by an overview of the process of vocabulary acquisition and some fundamental notions about the process as the discussion of language transfer is narrowed down to the lexical level. Next, I look at the issues of so-called *false friends*, words which are identified wrongly by bilinguals often due to language transfer (or *cross-linguistic interference*). False friends in Chinese and Japanese are then introduced in the following section. The specificities of Chinese and Japanese languages in terms of language transfer are also included in the literature review. The review ends with a summary of what has been discussed in the literature review and how these previous studies apply to the present study.

The second section of this paper demonstrates the experimental details. The methodology is fully described, followed by the predictions and results. The discussion of the results of the current research is located in the third section. I first provide a general discussion directly related to the findings of this study. The discussion continues with the reliability of the notion of language-nonspecific access and the language-specific properties of Chinese and Japanese. Then I draw attention to the pedagogical implications of the findings with some suggestion for LT purposes. Finally the limitations of the current research are provided. In the last section, I give the conclusion of the present study and point out some directions for future studies in the related topics.

2 Literature Review

2.1 Language Transfer

As Cook (2003) has pointed out, languages in a bilingual/multilingual mind cannot be in watertight compartments as they are in the same mind—language systems in one mind must have an interconnection. Such interconnection, broadly considered, is what is called cross-language influence in much SLA and LT research. The concept of cross-language influence as a seriously discussed issue dates back to half a century ago. One of the most commonly cited studies on cross-language influence, Weinreich (1953), regarded this linguistic phenomenon as the deviation from the norms of either language spoken by a bilingual, and as an outcome caused by the familiarity of the bilingual with more than a single language. Because such an influence often comes along with transference or borrowing of linguistic elements from one language to another, the term language transfer (or cross-linguistic transfer) is also largely used to indicate the influence of a language on another one.

In fact, in the 1950s and 1960s the general consensus was that an L2 learner's errors would be predictable through comparing the contrasting grammars of the L1 and the target language; the gap between the two grammar systems was predicted to be where the errors would come from. This belief originated in a behaviourist theory of language acquisition in which learning was considered as habit forming. It was believed that the habits of L1 were transferred to the newly-learnt habits of L2 under linguistic interference (Benson, 2002). Very soon a reaction against this point of view could be found, and from the 1970s the occurrence of transfer was not denied. From the developmental position, L2 must be learnt in the same way as L1, and be

independent of the L1. It has hitherto been accepted that language transfer does exist and the issue is still widely studied, especially by SLA and LT researchers. Now the phenomenon seems to be far more complicated than it used to be—it is distinct from beliefs in the middle of the 20th century and now it is also thought that language transfer is not the only reason that accounts for linguistic errors, nor does it always result in errors.

2.1.1 Positive/Negative Transfer

Up to now language transfer has been presented without offering a positive or negative evaluation. However, according to many SLA and LT studies, the influence of one language on another language, can be evaluated in at least three ways: as having positive, negative or neutral effects.

The effects of positive transfer are most likely determinable through comparisons of successful L2 users with different L1 backgrounds. It has been found that cross-linguistic similarities often lead to positive transfer from the data of such comparisons (Odlin, 1989). For instance, similar lexical formations between the native language and a target language reduce the time taken to memorize vocabularies of the target language. Phonological similarities between the L1 and an L2 help the L2 learners to produce sounds closer to native speech production. Similarities of syntactic structures in the two languages can also assist the learners with articles, word orders and relative clauses in their L2 learning.

Negative transfer refers to effects that cause divergences from norms in a target language. It can be easily identified in contents where learners made an ungrammatical literal translation and bring the collocations or word order of their L1 to the target language, for example. Although the divergences are usually linked with linguistic errors made by L2 users and are

more detectable in such cases, sometimes the divergences have more to do with frequency. For example, L2 structures which are very distinct from counterparts in the L1 seem to be used less by the L2 learners. The learners may therefore make nearly no mistakes in their L2 speech. But those structures in the L2 speech that the learners try to avoid then become comparatively infrequent relative to native speakers' speech, because their avoidance contributes to an outcome of underproduction. A study by Schachter (1974, cited by Odlin, 1989) showed that Chinese and Japanese native speakers who learn English as a second language (ESL) tend to use fewer relative clauses in English than other ESL students whose L1 has similar structures to the English relative clause. Overproduction of other structures is often a consequence of underproduction, when ESL students produce more simple sentences in their avoidance of complex structures such as relative clauses (Odlin, 1989).

Many of the effects of language transfer simply amount to differences between the native language and target language. Sometimes it would be problematic to assess whether the differences have positive or negative effects on linguistic competence. Voice onset time (VOT) production is one example. VOT refers to the duration between the release of a stop consonant and the beginning of the vibration of the vocal folds. Opler (1982) as cited by Cook (1995) found that bilinguals of English and Hebrew tended to exaggerate VOT differences for each language in terms of speech production, but for perception they occupied an intermediate position between the two languages. Compared to monolingual users of English or Hebrew, the bilingual speakers held marginally different L1 systems in English and Hebrew even though the differences would not be detectable without instrumental analysis. It would be difficult to interpret such language transfer as either a positive or negative effect. Cases like this are usually presented as neutral transfer.

At this juncture it would be important to clarify the general understanding for the evaluation of language transfer. Whether a speaker's performance in one language is enhanced or harmed by another is judged by researchers, teachers or native speakers on the basis of comparisons of target language outputs with the norms of the native language. The term 'transfer' itself is neutral and does not imply either positive or negative evaluation. Although the concept of language transfer may include separate learning processes, perception, representation and production, positive/negative transfer basically refers to production only (Gass, 2008). In other words, while there is a process of language transfer, it is not necessarily useful to talk about processes of 'positive' or 'negative' transfer. One must be cautious about terminology of this kind as it may make confusion about the neutrality and linguistic processes. For example, in much SLA research the term *interlanguage* referring to the knowledge of a learner's L2 is often discussed together with language transfer, which may cause confusion about the neutrality of transfer—since interlanguage can also be defined as an L2 that has not become fully proficient and preserves some features of the L1, it may, therefore, imply a somewhat negative image and unidirectionality (from L1 to L2).

2.1.2 Backward Transfer and the Bidirectionality

The term 'language transfer' in SLA research has traditionally been understood to say that the L1 or some previously learned language has influence on the speakers' L2 (or any additional language). Many SLA scholars have concluded that quite a few of the features shaping an L2 can usually find their origin in the L1 (Gass and Selinker, 1992; Jones and Tetroe, 1987; Odlin, 1989, 2003). The predominance of the focus on the borrowing from the L1 (forward transfer), however, has ignored the possibility that language transfer may in fact be bidirectional. That is to say, cross-language influence should be seen as a two-way interaction between the two language systems in the mind of L2 users (Cook, 1991, 1995, 2003). In fact,

when Weinreich (1953) first mentioned the notion of cross-linguistic interference, the deviation was to be determined by the norms of either language. Due to the bidirectionality of language transfer, cross-linguistic interference can simultaneously work both ways: either forward or backward.

In contrast to forward transfer in which the features of the L1 are used to process L2, backward transfer refers to instances where the reverse pattern appears (Saygin, 2001). A study by Pavlenko and Jarvis (2002) argued against the traditional approach to language transfer where cross-language influence was considered as a unidirectional effect of native knowledge on the newly acquired language but not the other way around. In their study they demonstrated that the L1 of Russian native speakers began to be influenced by English that they were learning as an L2 even while their L1 Russian continued to affect their L2 English.

Whether because the effects of an L2 on the L1 are less detectable than the converse, or for other reasons (as discussed earlier), only a handful of research has so far examined how knowledge of a newly acquired language would influence the knowledge of the L1 (Brown and Gullberg, 2008). For example, Tsimpli et al. (2004) demonstrated the influence of syntactic attrition on the native language of ESL speakers whose L1s were Greek or Italian. Their English had reached near-native fluency while their L1 was still in use. The results of this research showed that L1 attrition appeared when a particular L1 syntactic structure was interpretable and became unspecified due to the lack of a similar feature in the L2 for the same syntactic structure. Likewise, Van Hell and Dijkstra (2002) reported that L2 knowledge could affect native language performance in an exclusively L1 context. Their trilingual participants had Dutch as their L1 and showed shorter response time (RT) for cognates with their translations in L2 (English) but not for non-cognate items. The RTs of participants with

advanced English and French for both English and French cognates were shorter than words which were non-cognates in an exclusively native context.

As Pavlenko and Jarvis (2002) have pointed out bidirectional transfer could be found in studies in the fields of SLA and bilingualism, even though the amount was not too many. The thing is so far transfer research from the bilingual perspective has mainly focused on childhood or simultaneous bilingualism. When it comes to post-puberty SLA, most attention has been given to L2 users who live in the L2 environment. Very often speakers of an immigrant language variety or a language contact have featured in sociolinguistics-oriented research which might discuss more about combining usages from several generations of bilingual speakers in a particular community than about individual transfer patterns. It has only been recently that SLA researchers have started to address themselves to L2 influence on L1 in accordance with late bilingualism. As it stands, more evidence is still needed for the study of backward transfer, especially for transfer in post-puberty L2 learning.

As with forward transfer, L2 may also have positive or negative influences on the L1. Evidence has been presented for the L1 being enhanced by an L2 with several bilingual combinations of different languages in which the L1 of child L2 users contained more complex sentences or precocious mentalinguistic skills when compared to the monolingual children (Kecskes and Papp, 2002; Bialystok, 2001). The usual context that describes how the L1 could be harmed by the use of an L2 deals with issues such as language loss or attrition. As many linguistic issues, the phenomenon of losing skills in the L1 has a twofold form, sociological or psychological, which means that language loss can be analyzed in terms of a whole linguistic community or in terms of an individual, respectively (Oxford, 1982). Here in the present study the discussion on the negative effects of language transfer is based on a

psychological analysis rather than a sociological one.

2.2 Transfer of Lexical Skills

So far we have presented language transfer as a phenomenon that can commonly happen in different aspects of language learning. In this section, the discussion of language transfer is focuses specifically on the lexical level. To begin with, here, Levelt's (1989) model of the internal structure of lexical information within a lexical entry is adopted in order to gain an insight into vocabulary acquisition in L1 and L2.

2.2.1 Internal Structure of Lexical Information

To acquire a language (be it an L1 or an L2), the learning of vocabulary is a fundamental step for many learners to start with. The learning can be considered in four interrelated aspects: namely representation, acquisition, processing, and production. Considering the whole process of learning vocabulary, each lexical item can be presented as a listing of a least four kinds of features. The features include the item's meaning, its syntactic properties, its morphological specification, and the represented form. As in the graphic description shown in Figure 1.1, a represented lexical item includes two different types of component (the lemma and the lexeme) in which four aspects of information will be stored in the mental lexicon. The lemma contains two pieces of information, about semantics and syntax, while the lexeme contains the morphological specification and the orthographic specification. Note that Levelt's (1989) original specification referred to phonology only. Since in the present study, orthography rather than phonology is the main point of discussion, Figure 1.1 substitutes orthography for phonology.

Represented Lexical Entry

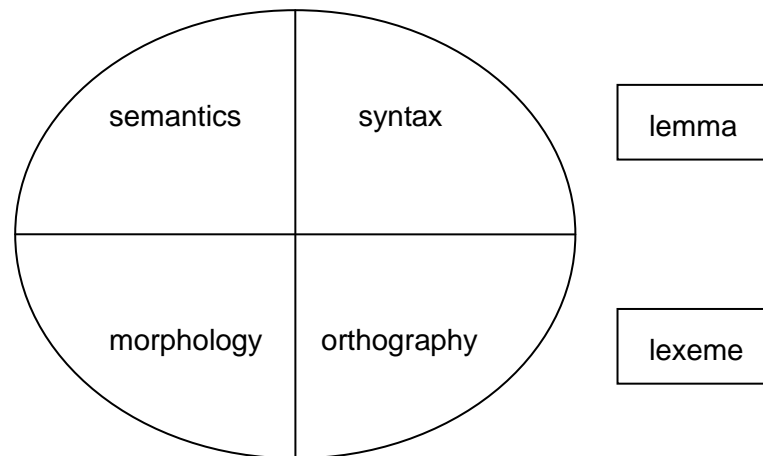


Figure 1.1 Components of an item in the mental lexicon.

In L1 vocabulary acquisition, extracting the information from a lexical entry requires extensive and highly contextualized input from the language. At the beginning the information which children actually extract may not be considered completely accurate or correct. However, these different types of information within every lexical item are so integrated that once the entry is formed all aspects of the information automatically becomes available. With highly contextualized exposure to the L1 and the automatically activated feature of the lexical information, what children have learned about these lexical entries becomes an integral foundation of their vocabulary acquisition, which eventually allows children to use lexical items in natural communication in the same way as adults (Jiang, 2000).

However, such progress appears to be inconsistent with the vocabulary acquisition observed in L2, especially in late bilingualism because of the previously existing developed L1 lexicon and the fact that less input is available in post-pubescent L2 learning.

2.2.2 L2 Vocabulary Acquisition and Transfer in Acquisition

At first glance, the L2 mental lexicon of post-pubescent L2 learners may seem structurally similar to the L1 mental lexicon. In fact, however, the different depths between L1 and L2 lexical knowledge are generally believed to lead to distinct processing of vocabulary acquisition in terms of the degree of integration into the L1 and L2 mental lexicon (Wolter, 2001). Besides, learners of the L2 are already in possession of a well structured and highly sophisticated lexicon, namely the L1 lexicon (Wolter, 2001). As Jiang (2000) suggests there are two practical features which should be taken into consideration to account for the difference between L1 and L2 lexical processing. One is the exposure to L1 and L2 with regard to both quality and quantity. Unlike the rich sources of lexical information in the L1 acquisition, the poverty of L2 input makes it more difficult for L2 learner to extract semantic, syntactic and morphological specifications and to integrate them into the mental lexicon for each lexical entry in the L2. The other practical constraint is the presence in L2 acquisition of previously created conceptual/semantic networks based on the L1 acquisition. The impact of this seems less straightforward but may be more significant in many ways. Unlike children's L1 vocabulary acquisition, in which new formal specifications as well as semantic specifications are set up, adults' learning primarily concentrates on the creation of formal information only. Given a fully developed L1 lexicon, adult L2 learners often show the tendency that their vocabulary acquisition in the L2 heavily relies on and borrows from the established conceptual/semantic networks in the L1 because it is unnecessary to establish another semantic specification that is identical, or at least similar, to the existing one in the L1 mental lexicon.

Due to the unique L2 learning conditions characterized by the two practical constraints mentioned above, the primary task in vocabulary acquisition is to learn the formal

specification, i.e. phonology and orthography, rather than to acquire the conceptual/semantic information (semantic and syntactic specifications) of lexical entries. Consequently, very limited semantic, syntactic and morphological knowledge can be extracted from the L2 input, and such a learning approach might establish a representation without the lemma (or leaving lemma component of a lexical item empty). Later, through the L2-L1 lexical links between the L2 words and their L1 translation alternatives the L2 learners are able to reach the meanings and some grammatical information of the L2 words. Also, learners may learn explicit grammatical information about these items in their SLA education (Jiang, 2002). Such learning approach may be similar but not identical to the mechanism of learning L2 words that have identical orthography in the L1 since the learner can recognize the orthographic presentation already and does not have to relearn it again. For this reason, when the learner start to learn these L2 words the L2 system of the learner may directly link to the L1 system and semantic, syntactic, and morphological information would be transferred from the L1 lexicon to the L2 lexicon.

How a L2 word is learned may depends on whether the word has an L1 lexical item which is semantically/orthographically identical with it. No matter how an L2 word is learned through the L2-L1 lexical link², L2 vocabulary acquisition heavily relies on knowledge in the L1 lexicon at least in the beginning stage. At the end of the acquisition the internal structure of the L2 lexical entry would look very similar to a lexical representation in the L1. However, to reach the last stage of L2 lexical development requires advanced L2 proficiency, especially when the learning is acquiring L2 words that share one identical specification with L1 words

² It must be pointed out that the process of L2 vocabulary acquisition described above refers to the learning of a specific word but not the lexical development of an individual learner. There is unlikely to be any clear-cut situation since a learner's L2 lexicon may accommodate words with various internal structures. There may also be some grey areas throughout the different stages in the processing. For example, an L2 word may contain a representation with both lemma and lexeme in terms of L2 comprehension but not in production.

but differ in the other specifications. In such cases, very often cross-linguistic interference (negative transfer) or lexical fossilization occurs at the stage where L2-L1 lexical links are used by L2 learners to form the meanings and some of the grammatical information of L2 words (Jiang, 2002). Cross-linguistic interference or lexical fossilization may further block the vocabulary learning that leads to advanced L2 proficiency. Furthermore, the current research proposes that L2 vocabulary acquisition in such cases may show backward influence on L1 performance because the learner's L2-L1 links have become strong once learner has achieved a certain level of the L2 fluency even if not reached advanced proficiency

Sometimes in L2 vocabulary acquisition a proper lemma structure is already in place because of the relevant information transferred from the L1 conceptual/semantic network fits well in the L2. This is considered as an example of positive transfer. However, in some cases the transfer will not be straightforward and the information will need fundamental restructuring. Such lexical restructuring would happen when there are insufficient or divergent connections between L1 and L2 words and where the interaction between words leads to conceptual modification (Wolter, 2006). In other words, it is the conceptual/semantic gap between L1 and L2 lexical items which requires alterations to the network structure in order to correspond with L2-specific properties. This is where negative transfer would commonly be seen: errors made by learners who have not achieved advanced fluency and are not able to accurately distinguish L2 semantics from meanings in L1. To put it more specifically, when an L2 word has information transferred from L1 lexicon with different degree of lemma overlap between the two languages, it is very likely that non-native collocations will appear and what are called 'false friends' to be discussed later.

2.2.3 Language Mode and Language-Selective Access

Up to now transfer of lexical skills has been discussed in association with L2 contexts. In this section, the attention is directed to L1 performance in the context of L2 vocabulary acquisition. This is discussed in relation to two processing hypotheses in terms of L2 vocabulary acquisition: the notion of *language mode* and the theory of language-(non)selective access.

For the description of bilingual processing, Grosjean (1997) proposed the notion of a 'language mode'. According to this proposal, bilingual speakers are assumed to find themselves in a setting indicating to a point on a continuum from monolingual mode to bilingual mode in their everyday using of languages. The setting depends on the content of their language use and may easily change from time to time. At one end of the continuum lies a solely monolingual mode where only one language is appropriate; that language is activated in the bilingual speaker and the other language is deactivated. At the other end of the continuum is a bilingual mode where both languages are kept active and ready for communication although normally in the bilingual mode one language is more active than the other as it is used as the primary language.

As an alternative to the language mode proposal, the mental lexicon in L2 vocabulary acquisition can be in terms of language-selective or language-nonselctive access (Van Hell and Dijkstra, 2002). The notion of language-selective access is based on the belief that a bilingual's mental lexicon is organized by language. According to this account, only words in the contextually relevant language will be activated in the bilingual's communication despite the fact that the L1 and L2 lexicon link with each other, which is similar to the language mode account. However, the language-nonselctive access proposal also suggests that the lexicon in a bilingual mind is associated with item characteristics, which means words from both

languages will be activated regardless of language (or languages) used in the context. Even in a purely L1 or L2 context, words from both languages are activated in the mental lexicon, and this is the situation where language transfer may happen. Several studies are presented by Dijkstra et al. (2000) which show that more and more scholars are convinced of nonselective access and support the claim that bilingual word recognition is organized on the basis of parallel activation in nature.

2.2.4 What are False Friends?

It is accepted on all hands that in L2 vocabulary acquisition learners benefit from the sharing of conceptual/semantic information through L2-L1 links. A corresponding, or at least similar, concept from the L1 lexicon can be called in to help to build a new L2 lexical item in the L2 lexicon. It is not, however, the case that all the conceptual/semantic elements from L1 lexicon have the same degree of overlap with L2 lexical entries. In instances where the L1 and L2 elements diverge (i.e. where there is a lexical gap between the L1 and L2) it can be expected that negative transfer will be seen in the L2 vocabulary acquisition. The most obvious type of negative transfer would probably be unnatural collocations in the use of L2, and false friends in both L1 and L2. The formal overlap of false friends across different languages has long been an important source of stimulus materials in research attempting to unravel the activation of bilingual/multilingual lexical mapping (Dijkstra et al., 2010).

In the present study, I will use Chinese-Japanese false friends in order to demonstrate backward transfer. Therefore, I will discuss false friends in some detail in the present section. False friends are common and easily available in most languages, and for the present study they also have the advantage that they can show bidirectionality of language transfer.

Depending on the degree of the semantic overlap between an L2 word and its corresponding L1 translation, three types of relationship can be identified. *Strangers* are used to describe those L2 words which have no suitable L1 translations. *Real friends* are defined as L2 words with L1 translations when those translations and the L2 words are well-matched. To put it another way, there are also L2 words with L1 translations which do not overlap semantically to a high degree. These instances, which can also be understood as showing a semantic gap between L1 and L2, are so-called *false friends*.

An alternative way of describing the semantic and formal relationships between L1 and L2 words is offered by Dijkstra et al. (2000), using the terms *cognates* and *interlingual homographs*. Cognates refer to words which have identical, or at least similar, spelling/pronunciation in different languages and which also largely overlap in terms of semantics, for example words such as ‘doctor’ and ‘hospital’ in English and Spanish. Words across different languages which share the same orthography but differ in meanings are called interlingual homographs. For instance, the English word ‘list’ has an orthographic counterpart in German which has the very different meaning ‘trick’ or ‘guile’. Normally interlingual homographs correspond to false friends.

Although false friends (or interlingual homographs) often cause confusion about meanings across different languages, there may still have positive effects and reduce the difficulties of the vocabulary acquisition. For example, Jiang (2000) highlighted a ‘real friend’ situation in which the syntactic properties of an L2 word are not completely equal to the syntactic properties of its identical L1 translation equivalent because the words belongs to different part of speech in the two languages. In such a situation it is less likely for learners to notice the pragmatic gap between a real friend and its syntactic properties than it would be in the case of

a false friend L2 word and its L1 translation—the real friends may cause pragmatic errors because they are syntactically different. This awareness is considered important for vocabulary acquisition, especially for the first step toward the establishment of a new semantic context which is specific to the L2 lexical item.

2.2.5 False Friends in Chinese and Japanese

Thanks to the sharing of Chinese characters, learners of Japanese language who have previously acquired Chinese benefit from their linguistic knowledge in Chinese in terms of Chinese script recognition, and vice versa. Despite the variation of Chinese allography (there are many graphemes having more than one written representation in the Chinese script), in most cases the graphemic differences (to be discussed in section 2.4.1) between one regional standard and another does not interfere with the ability of Chinese or Japanese users to recognize the characters. Moreover, users of a Chinese-script-based language (or dialect) seem to easily transfer meanings from the language to another one that also uses Chinese characters once they have identified the grapheme in the latter language (Shao 邵, 2005). Usually the processing of form would not produce mistakes in language use. However, it could be problematic when the processing moved further to the stage of form-meaning mapping. This is especially obvious in the cases where the same written representation differs in meanings in two languages or dialects.

The relationship between forms and meanings in Chinese versus Japanese may seem to be complex at first glance. Most of the relationships can however be categorized, and this has been done in several studies (Otsuka 大塚 and Lin 林, 2010; Shao 邵, 2005; Takeda 竹田, 2005; Zhang 張, 2010). Basically, the orthographic and semantic equivalences or differences between Chinese and Japanese can be classified into five ways. Although there might always

be some that would fit in more than one category as the semantic interpretations are changing from time to time, ultimately the classifications are decided as below:

(1) *Isomorphic synonymy* (同形同義語), normally correspond to cognates. Words in this category share identical forms and meanings in Chinese and Japanese. The acquisition of new lexical items belonging to this category in the target language can be done by simply transferring graphemic and semantic knowledge from the native language to the target language regardless of whether Chinese or Japanese is the native or target language. In this case, the process of lexical acquisition is considered as an instance of positive transfer (Takeda 竹田, 2005). Such cognate transfer in which knowledge in one language is borrowed to help word recognition in another language has been called *cognate facilitation* in previous studies (for example, Dijkstra et al., 2010). Words such as ‘classroom’ (教室), ‘bank’ (銀行) and ‘animal’ (動物) are isomorphic synonyms in Chinese and Japanese.

(2) *Heteronymy* (同形異義語), normally correspond to interlingual homographs. Pairs of words look the same in both languages but differ in meaning in Chinese and Japanese. Often words in this category have meanings in one language which are rather distinct from meanings in the other language. It would be less expected to see language transfer occurring between heteronyms in the two languages (Zhang 張, 2010). For example, the identical form 深刻 is found in both Chinese and Japanese, but in Chinese it has the meaning ‘impressive’ and is semantically different from its Japanese meaning ‘serious’ even though they are presented with exactly the same Chinese characters.

(3) *Polysemy* (同形類義語). A pair of words with an identical orthographic representation

has some mutual meanings as well as a semantic gap between meanings in the two languages even though the semantic difference is normally a minor one. The polysemous category is probably the most complex one among the five classifications as it contains three subcategories. (Type 1) A Chinese polysemous word may have more meanings besides those parallel to the corresponding Japanese word (see Figure 2.1). For example, the word ‘緊張’ indicates the mental tension in Chinese and Japanese that is usually translated as ‘nervous’ in English. However, in Chinese the word could also mean the physical tension: in particular, it often refers to one’s financial situation and can be translated as ‘hard-pressed’ in English, but this meaning is not shared by the Japanese word. (Type 2) On the other hand, this kind of unbalanced relationship may involve a Japanese polysemous word which has broader meanings than its corresponding Chinese word, as shown in Figure 2.2. In both Chinese and Japanese the word ‘監督’ is the verb ‘to supervise’, but Japanese (though not in Chinese) the same form ‘監督’ could also be a noun that means ‘director’. (Type 3) Chinese and Japanese words may have their own extra definitions separately but share a part of semantic range mutually. For instance, the word ‘保險’ represents the concept of ‘insurance’ but differs in the nuance: Chinese further includes the concept ‘for the purposes of safety’ while Japanese, on the other hand, is closer to what is translated as ‘warranty’ in English. This is illustrated in Figure 2.3. The communication gap between different semantic ranges may result from subtle nuances as exemplified in the word ‘保險’. The gap may come from vocabulary usages in a language which are only seen or heard in certain situations. Sometimes the connotations of a word may be positive in one language but negative in the other (Shao 邵, 2005). If the users of Chinese or Japanese do not pay extra attention to the distinct ranges, it is very likely that they will extend the meaning of a word from one language to the other. This might explain why some scholars regard the cross-language influence on polysemous

vocabulary acquisition as negative transfer (Takeda 竹田, 2005).

Semantic Range

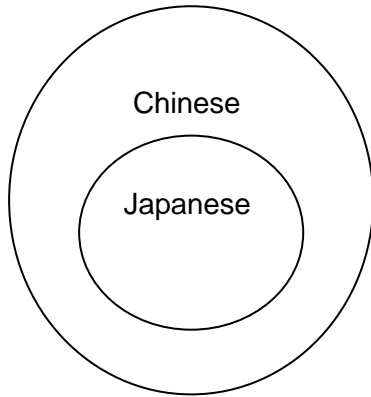


Figure 2.1

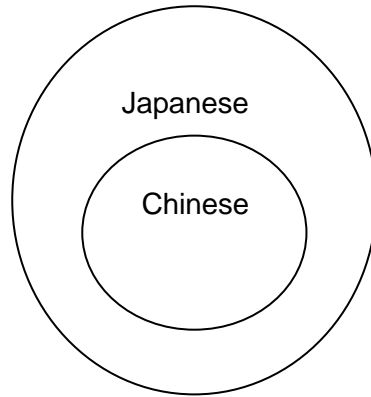


Figure 2.2

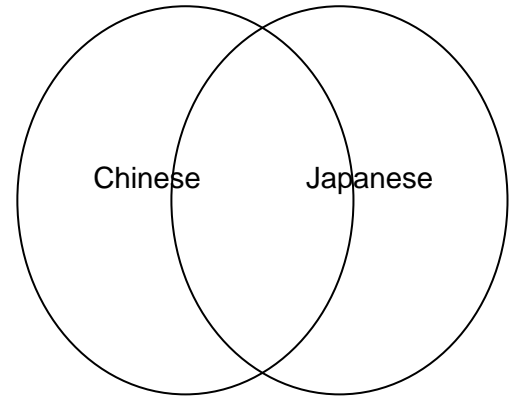


Figure 2.3

(4) *Synonymy* (異形同義語). Pairs of words look similar and indicate one or more than one mutual concept or object, for example 不可思議/不思議 ‘mysterious’ and 語言/言語 ‘language’ in Chinese and Japanese respectively. As long as learners pay attention to the fine distinction between Chinese and Japanese forms, the acquisition of synonymous lexical items should not be difficult. Thus, some studies consider learning synonyms in the target language through understanding of correlative synonyms in the native language as a case of positive transfer (e.g. Lin 蘭, 2011).

(5) Some words which are formed with certain Chinese characters can be found only in Chinese or Japanese, for instance, 房子 ‘house’ occurs only in Chinese and 番組 ‘programme’ occurs only in Japanese. That is to say, neither 房子 nor 番組 holds semantic functions in the other language. For Chinese speakers L1 transfer should not appear in the use of Japanese words such as 番組 since these words does not exist in Chinese (Zhang 張, 2010).

2.3 A Language-Specific Perspective on Chinese and Japanese Lexicons

Five different types of relationship between Chinese and Japanese lexical items in terms of the form-meaning mapping have now been shown. Except for the Chinese/Japanese words in the isomorphic synonymy category, the lexical items belonging to the other categories all bring some features that may to some extent cause negative transfer at some points. The different relationships reflect different degrees of language transfer. The following section will discuss in more details the cross-language influences that are specific to the Chinese-Japanese bilingual lexicon.

2.3.1 Allographs in Script

A lexical item in Japanese could mean a Japanese word presented in *Kanji* (Chinese character), or a word in *Hiragana* or *Katakana* formation. Kanji and Kana (both Hiragana and Katakana) are the logographic or syllabic scripts used in written Japanese. Although these scripts have their origins in Chinese languages used from dynasty to dynasty, the adoption of the Chinese writing system turned out to be divergent between Chinese characters used in Chinese and Kanji/Kana used in Japanese at present (Taylor et al., 1995). In fact, the change in Kanji is comparatively smaller than in Kana and there is still a noticeable degree of overlap between the Chinese characters used in Chinese and Japanese. Such orthographic overlap often leads to the false friend relationship when the characters have different meanings in Chinese and Japanese.

Since cross-language influence is the topic in the present study, Japanese words sharing the representation with Chinese words in Kanji of great interest. Although these characters have the same origin, their form has been changing according to different regional standards from

time to time. In Japanese, for example, such change is generally thought to result from (1) the creation of new characters in Japanese, (2) the different definitions given to characters that have been defined differently in Japanese and (3) the simplification of Kanji after World War II. Likewise, the process of character simplification in mainland China has made some simplified characters hard to recognize for native Japanese speakers. In comparison with simplified Chinese characters introduced by the government of mainland China in the 1950s and used commonly in the present day, traditional Chinese characters refer to the standardized character sets that have not be simplified, which are mainly used in Taiwan, Hong Kong and Macau. In some cases, Chinese characters used in Japanese language would be identical with those used in Chinese on the basis of traditional or simplified standard (or both standards). For some cases, Japanese Kanji might have its own unique presentation that is distinct from either regional standard.

According to Yamato 大和 and Tamaoka 玉岡 (2009), approximately 4,000 Chinese characters in Chinese and 1,945 characters in Japanese are commonly used in daily life (not including those that are distinct from one language to the other in terms of orthographic form). Of these commonly used Chinese characters, about 98.1% (1,908 words) of them are items which overlap in both languages. To put it simply, almost all the commonly used Chinese characters in Japanese can be recognized and are also used by native Chinese speakers. This ensures that ‘false friend’ is a common relationship between Chinese and Japanese lexical systems.

2.3.2 Logograms of Chinese Characters

Another feature of Chinese character which must be noted is the way how a character is derived. All Chinese characters are *logograms* but with several derivative types—a Chinese

character may derive from pictograms, may have an ideographic origin, or it may be formed as a phono-semantic compound. Taking this derivative feature into the word recognition process of Chinese characters can expect that users of Chinese/Japanese inevitably pay more attention to a lexical entry's orthographic specification rather than its semantic or phonological information. Thus, it is more likely to be a task of word recognition than vocabulary acquisition when Chinese speakers see a new lexical item in a Japanese context (or vice versa) because the processing focus is on the orthographic information only and it does not go deep enough to deal with either semantic or phonological information (Lin 蘭, 2011). It may also be true from the behavioural point of view that Chinese or Japanese learners tend to transfer the meaning in one language to the context in the other language once they can recognize one lexical item by its orthographic form (Shao 邵, 2005).

2.3.3 Parts of Speech

It may be common to find SLA teachers of Chinese or Japanese pointing out the contextual usages of certain L2 lexical items in class. One of the purposes of doing so is to avoid errors caused by the gap between the native and target language in terms of the part of speech. Even when lexical items in Chinese and Japanese share identical orthography and largely overlapping semantics, they may still differ in terms of their part of speech. An example is the word 迷信 'superstition' that is used as a noun in Japanese but as a verb in Chinese instead. Zhang 張 (2010) categorized such instances as isomorphic synonymy and stressed that learners tended to make a grammatical mistake in their L2 production because of the gap with respect to the part of speech.

2.3.4 Phonological Perspective

As well as the gap resulting from the part of speech, it might also be worthy mentioning the

phonological gap between Chinese and Japanese words in the isomorphic synonymy category, i.e. Chinese/Japanese cognates. Even though they share largely overlapping meanings, and even though the same orthography it is difficult to find any with identical pronunciation in the two languages. This gap between orthographic and phonological mapping may give rise to negative transfer in L2 vocabulary acquisition (Yamato 大和 and Tamaoka 玉岡, 2009). In contrast, there are some words in Roman alphabet languages that can be identical, or at least similar, in phonology although they differ in orthography and semantics (i.e. *interlingual homophones*). Quite a few previous studies have discussed language transfer in Roman alphabet languages by using such items (for example, Lemhöfer and Dijkstra, 2004). One may suggest there is place for the discussion about homophones in Chinese and Japanese with respect to cross-language influence.

2.4 Summary

In summary, the literature review started with an overview of language transfer with examples where transfer was described as having positive, negative or neutral effects. It was followed by a discussion with a specific focus on backward transfer in line with the view that language transfer can be bidirectional. Because backward transfer has received little attention, the present study aims to provide more evidence that accounts for backward transfer, especially on the lexical level. Thus, the discussion of language transfer in a bilingual/multilingual mind was narrowed down to the lexical level. An internal structure was used to distinguish L2 vocabulary acquisition from L1 lexical learning and to gain an insight into the transfer of different type of lexical information from the L1 lexicon to the L2 system. Based on the concept of language-nonspecific access, the review explained how the transfer of lexical skills in the processing of L2 vocabulary acquisition would happen. False friends, were then introduced. False friends are an important source of stimulus materials in research attempting

to unravel language transfer at the lexical level, as these stimulus items are often identified wrongly by bilinguals due to language transfer (or cross-linguistic interference). Unlike much previous research on false friends, which has specialized in Roman alphabet languages, the present study concentrates on false friends in languages that do not use a Roman alphabet writing system, namely Chinese and Japanese. This section began by demonstrating the different types of overlapping relationship in terms of semantics and orthography. Before ending the literature review, the specificities of Chinese and Japanese languages related to language transfer were discussed. Overall, the studies discussed above were intended to provide the essential background for the present study's research question: how and to what extent is backward transfer implicated in the form-meaning mappings of native Chinese speakers who are also L2 users of Japanese.

3 Experiment

3.1 Methodology

In the present study I attempt to demonstrate the influence of L2 vocabulary acquisition on L1 lexical knowledge, i.e. backward transfer at the lexical level, by showing how native language performance can be affected by the knowledge of a non-native language, even in an exclusively native context. In terms of language setting, Chinese is introduced as the dominant language (or the L1) while Japanese is treated as the weaker language and an L2 in the current research. An experiment is conducted to ascertain whether there is evidence to support the presence of backward transfer. In the experiment the Chinese lexical knowledge of Taiwanese students who have learnt Japanese as an L2 is investigated. By lexical knowledge it meant the semantic and orthographic information of a lexical entry. Although syntactic and morphological specifications are taken into consideration at some points they

are not the primary issues in the present study. Moreover, instead of phonological information, I intend to focus on the orthographic presentation for the formal specification. Hence, the interactions between semantics and phonology in Japanese L2 learning of Chinese native speakers are not considered as a main point to be discussed in the current research.

It must be noted that the present study assumes that L2 vocabulary acquisition is based on links between L1 lexicon and L2 system. The L1-L2 links make a monolingual lexicon distinct from a mental lexicon with more than one language. A similar concept has been advanced by Grosjean (1998), who argues that the compound state of the bilingual mind is not the sum of two monolingual language systems in one body but that the two languages are interconnected. Within this framework, language transfer can be discussed as a bidirectional influence which may affect not only an L2 or any additional language but also the dominant language, namely the L1. At the same time, the discussion of the experiment is framed in terms of the concept of language-nonselective access mentioned by Van Hell and Dijkstra's (2002) research. Standing at the point of view, it is assumed that the Chinese words as stimuli in the experiment would automatically cause parallel activation for the Chinese and Japanese mental lexicon of the participants, even when the linguistic situation only asks for knowledge in their native language and is a purely L1 context.

In the experimental part of the present study, 79 university students are given a Chinese form-meaning mapping task with 24 sets of words that share the same orthography in Chinese and Japanese but differ in meanings (namely false friends). The participants include a group of students who have learned some Japanese and a control group of students who have no or only minimal learning experience of Japanese language. The aim of this study is to report whether backward transfer can be seen at the lexical level by comparing the results of two

groups (with or without experience of Japanese) in the same task.

This experiment will also provide a basis for assessing the results of previous research on the same topic by comparing the previous findings with the outcome of this experiment. Firstly, I will compare the stability of the result patterns with a series of studies by Dijkstra and his colleagues (Dijkstra et al., 1998; Dijkstra et al., 2000; Van Hell and Dijkstra, 2002). These studies examined three factors that were thought important to the study of cross-language influence at the lexical level: (1) task demands and monolingual/intermixing experimental stimuli, (2) expected language(s) for responding and the language of the instruction, (3) relative language proficiency. After all language fluency showed bidirectional influence on the sensitivity to not only L1 performance but also an additional language. Since the present study tests participants with different levels of relative language proficiency, we will be able to compare the present results with the conclusion made by Dijkstra and his colleagues to.

Next, I aim to assess the effect of the degree of semantic overlap in line with the form-meaning mapping between Chinese and Japanese lexical items by the 24 sets of words in the experiment. Zhang 張 (2010) and Lin 蘭 (2011) have proposed that the degree of semantic overlap between Chinese and Japanese words will reflect the likelihood of the occurrence of positive/negative transfer. The two types of 24 sets of stimulus materials from the heteronymy category and the polysemy category are used to ensure whether this point of view appears to be convinced in the current research.

3.1.1 Participants

For the current research 79 native Chinese speakers were recruited. Although they were all native speakers of Chinese, none of them was monolingual; they all knew at least one L2,

namely English, which they all started to learn at around age 12 in secondary school. All the participants were students in the third year of Soochow University in Taiwan at the time of testing. They were recruited from two classes from two separate departments. In one class, the students major in Japanese culture and language. Students in this class have received at least three years of formal training in Japanese. In the other class, the students are from the department of Chinese literature and have no or minimal knowledge of Japanese. This group acts as the control group in the experiment. There are also eight students from other departments rather than Japanese culture and language/Chinese literature department who are taking one of these two classes. In both classes, there are more female students than male students.

On examination of the language learning background of the students who were recruited, 12 participants turned out to be invalid for the data analysis because although they were not studying in the Japanese department they nevertheless had more than a minimal degree of knowledge of Japanese. Data from these 12 participants are therefore excluded from the analysis. There were 60 students studying Japanese. They are further divided into two groups according to the proficiency of their non-native languages—one group (group 1) consists of 7 male and 15 female students who speak Japanese better than English according to their self-evaluation, and the other group (group 2) consists of 4 male and 24 female students whose self-evaluation shows that their English fluency is higher or as good as the Japanese. The control group (group 3) consists of 17 students (6 male, 11 female) without or with minimal experience of Japanese. (see Table 1.1 for details).

Participants Distribution

Inclusion	Department	Language Fluency	Male	Female	Total
Valid	Japanese	Japanese > English	7	15	22
		English ≥ Japanese	4	24	28
	Chinese & Others	No or minimal Japanese	6	11	17
Invalid	Chinese	Some Japanese	0	6	6
	Others	Some Japanese	0	6	6
Total Number			17	62	79

Table 1.1

3.1.2 Materials

The materials for the form-meaning mapping test consist of 24 words that are presented with traditional Chinese characters but have different meanings in Chinese and Japanese. Half belong to the heteronymy category and half are from the polysemy category. Three items of semantic explanation written in Chinese are listed below each of the 24 words. The combination of the three explanations contains one Chinese meaning³ and one Japanese meaning⁴ corresponding to the word, as well as a novel meaning which is closer to the Japanese meaning but further to the Chinese one (see Appendix).. In addition, the 12 words in the polysemy category have a broader semantic range in Japanese. They connect not only to the Japanese meaning but also to the Chinese meaning if these 12 words are interpreted in Japanese. The orders of each three definitions are counterbalanced throughout the 24 sets of

³ The Chinese meanings are based on the Chinese dictionary 重編國語辭典修訂本 edited by the Minister of Education, Taiwan (see <http://dict.revised.moe.edu.tw> [Accessed: 11 May 2011]).

⁴ The Japanese meanings are based on the Japanese dictionary デジタル大辞泉 published by 小学館 (see <http://dictionary.goo.ne.jp> [Accessed: 11 May 2011]).

questions. Given that the quality of the task materials is critical for the sake of the investigation, cautious procedures are followed in the composition of the materials. The forms of the 24 words are identical in Chinese and Japanese, and are legal according to the graphemic norms of both languages. All 24 words are disyllabic in Chinese pronunciation and are formed with two Chinese characters. According to Lin 蘭 (2011) disyllabic words are used most widely and frequently in Chinese since the number of disyllabic vocabularies is relatively large in terms of the proportion of disyllabic words in frequently used Chinese vocabularies. In order to ensure that the students with Japanese experience have learned and are using the 24 test words in a Japanese context, all 24 words are vocabulary items in the textbooks of students at the department of Japanese culture and language. Finally, to ensure that the ‘novel’ explanation is semantically further from the Chinese meaning than the ‘Japanese’ explanation, the 24 Chinese meanings were randomised and presented to three native Chinese speakers who were asked to rate the closeness of the relationship between the Chinese and Japanese meanings, and between the Chinese and novel meanings. All the ‘Japanese’ explanations appeared to be comparatively more related to the Chinese meanings than the novel explanations to the Chinese meanings in the semantic-relatedness judgment.

3.1.3 Procedure

The three groups of students (two groups from the Japanese culture and language department and one from the Chinese literature department) took part in the same task. Students from the Japanese culture and language department took the test together in one classroom. Students taking classes in the Chinese literature department took the test together in a separate classroom. The 24 questions were printed on two sheets of A4 paper. Items from the polysemy category were presented before items from the heteronymy category. Each question consisted of one orthographic word and its list of three explanations, accompanied by a 10-point rating

scale for the three explanations. In the instructions on the paper, students were asked to rate the semantic appropriateness of the three explanations in every set by giving them a number, 1 indicating the weakest relation and 10 the strongest. They were also told in the instructions to rely on their intuitions while doing the test. To control participants' experience of Japanese learning, all the students were asked to complete a questionnaire about their foreign language learning background before taking the test.

The instructions and test context were presented only in Chinese, the participants' native language. The instructions did not explicitly indicate that the participants' L2 proficiency was being tested, in order to control their language mode (Grosjean (1997) suggested the omission of language mode control might affect the activation of the language which was not processed). Hence the task explicitly aims to bring its participants into a monolingual mode, namely the native language mode. However, the participant may be examined their L2 knowledge without being noticed while they perform the task in their L1 as the procedure has taken all available precautions to minimise the possibility.

3.2 Prediction

In the experiment, the form-meaning mapping task allows us to observe whether backward transfer does take place. Since the test includes words from two different categories, we will be able to see to what extent the degree of semantic overlap will affect the degree of cross-language influence. The task will also allow us to look more closely at the role of relative language proficiency by manipulating the fluency of the participants' non-native languages.

For the results of the task, it would be expected to see all the participants marking Chinese

meanings with the highest scores and Japanese meanings with higher scores than novel meanings. Between the three groups of the participants who differ in Japanese experience, we would predict that students with Japanese experience ate Japanese meanings higher than other students who do not know Japanese. Within the group of Japanese majors, we would predict that language transfer effects will be stronger in the polysemy category than in the heteronymy category.

3.3 Results

After the raw data has been collected, average rating scores for each category of meaning are calculated, one for Chinese meanings, one for Japanese meanings and the other one for novel meanings. The mean scores are then reorganized into three groups by the L2 proficiency of the participants, and the score in each group is further divided into two separate scores in line with the type of stimulus (see Table 2.1). The invalid data of the 12 students whose language learning background did not fit the requirements of the study are discarded in calculating the means.

For statistical analysis the raw data is aggregated by subject (F_1 : each participant as one subject). A mixed three-way ANOVA is then carried out to assess the data, with group (group 1, group 2, group 3), stimulus type (polysemy vs. heteronymy) and category of meaning (Chinese, Japanese, or novel) as variables. Meanwhile, another mixed ANOVA is carried out to examine data aggregated by item (F_2 : each word which stands for three explanations is seen as one item) with group, stimulus type and category of meaning as variables. The main effect is significant for meaning both by subject, $F_1(2,128) = 149.10, p < 0.01$, and by item, $F_2(2,44) = 75.25, p < 0.01$. The mean score for Chinese meanings ($M 8.36, SD 2.33$) is higher than for Japanese meanings ($M 7.39, SD 2.97$) and novel meanings ($M 4.96, SD 3.11$). The

main effect for group is also significant, $F_2(2,44) = 15.75, p < 0.01$. A post hoc test verifies that the two groups of the Japanese class (namely group 1 and 2) do not differ from each other statistically

Test Scores

Group	Type	CH Meaning		JP Meaning		Novel Meaning	
(1) JP major with better JP	Polysemy	8.42	8.12	7.71	8.06	5.47	4.82
	Heteronymy	7.81		8.40		4.17	
(2) JP major with better EN	Polysemy	8.28	8.16	7.63	8.09	5.40	4.92
	Heteronymy	8.05		8.56		4.44	
(3) Other majors	Polysemy	8.95	8.94	5.07	5.37	5.29	5.24
	Heteronymy	9.05		5.69		5.10	
Average	Polysemy	8.55	8.36	6.80	7.39	5.39	4.96
	Heteronymy	8.30		7.55		4.57	

Table 2.1

There are two significant interactions by subject and by item. One is between meaning of category and group, $F_1(4,128) = 17.75, p < 0.01, F_2(4,44) = 49.30, p < 0.01$. The other is between stimulus type and meaning, $F_1(2,64) = 32.54, p < 0.01, F_2(2,44) = 3.84, p < 0.05$ by item. The interaction between group and stimulus type reaches significance on the analysis by item, $F_2(2,44) = 3.92, p < 0.05$, but not on the analysis by subject. There are no significant interactions either by subject or by item for type, meaning, and group. Figure 3.1 shows the relationship between category of meaning and participant group for polysemy stimuli and Figure 3.2 shows the same relationship for heteronymy stimuli from data aggregated by

stimulus item.

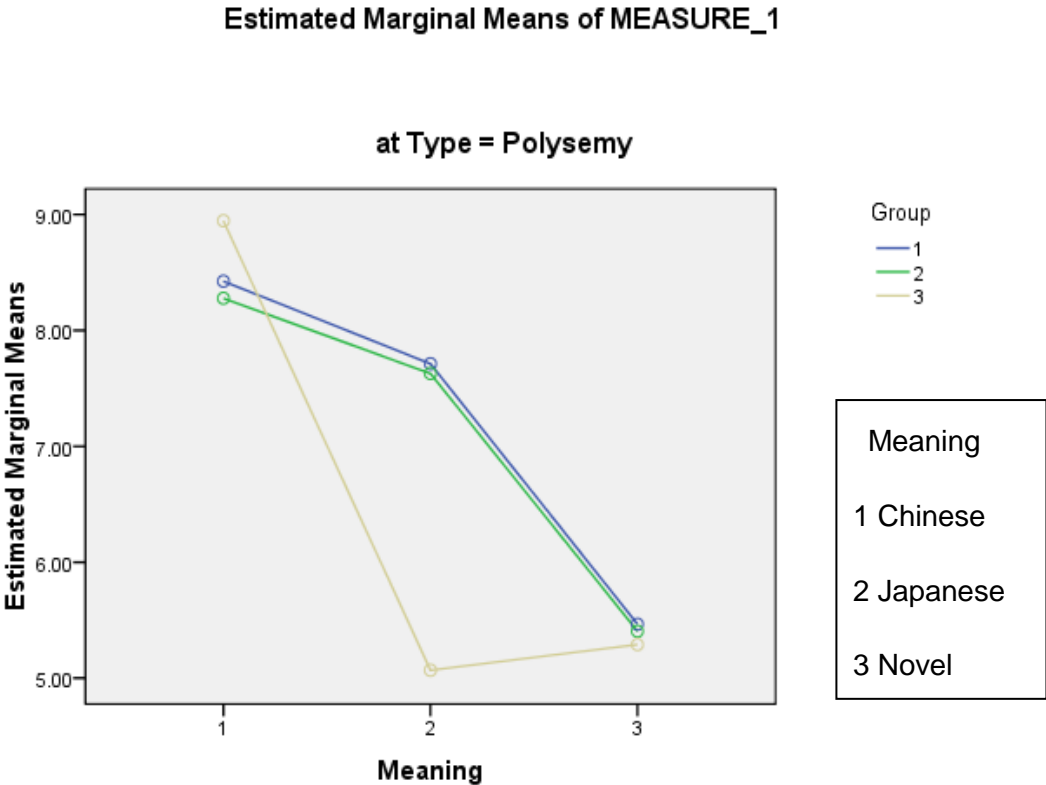


Figure 3.1

Estimated Marginal Means of MEASURE_1

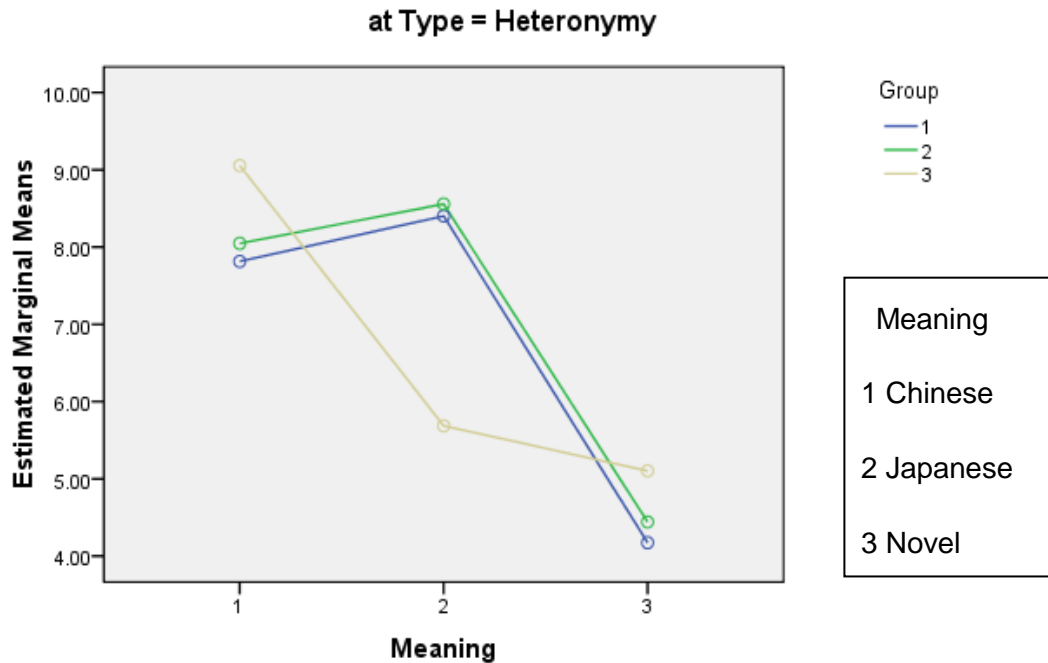


Figure 3.2

In order to look more closely at the effects of meaning category and stimulus type, three analyses (two-way ANOVA) according to the category of meaning are performed with group and stimulus type as the variables. An interaction between type and group can be seen on stimuli with Chinese meanings, $F(2,64) = 3.55$, $p < 0.05$, but not from stimuli with either Japanese meanings or novel meanings. A post hoc testing further reveals that there is no significant difference between the three groups on the mean scores for Chinese meanings and novel meanings, while the mean scores of Japanese meanings differ statistically between group 1 and group 3 ($p < 0.01$) and between group 2 and group 3 ($p < 0.01$) but not between group 1 and group 2. For the mean scores of Japanese meanings, students with Japanese learning experience have performed differently from students without any or with minimal Japanese abilities—the two mean scores for Japanese majors (group 1, $M 8.06$ $SD 3.21$; group

2, $M 8.09 SD 3.05$) are higher the mean of the students in group 3 ($M 5.37 SD 3.26$).

4 Discussion

4.1 General Discussion

As predicted, the participants from all three groups rated the Chinese meaning with the highest mean score and the Japanese meaning with higher mean score than novel meaning. This showed that the participants gave their ratings according to the degree of semantic appropriateness in the form-meaning mapping task. The students with Japanese experience, compared to the students without or with minimal Japanese experience, were found to provide higher rating scores on the Japanese meanings corresponding to the orthographic words even though the words were presented in an exclusively Chinese context. The results indicated that the L1 lexical performance of the students who know Japanese had been affected by their L2 vocabulary acquisition. This can be interpreted as strong evidence in support of the occurrence of backward transfer from an L2 to the L1. The results also showed no significant difference for the mean scores of Chinese meanings and novel meanings between the three groups. These findings indicated that L2 knowledge had an influence on L1 performance but the influence seemed to be limited to namely Japanese. Such evidence shows that the comparatively higher scores of Japanese majors for Japanese meanings resulted from the effects of L2 knowledge rather than an across-the-board difference in response patterns.

Next, let us evaluate the stability of the result patterns based on a series of studies by Dijkstra and his colleagues (Dijkstra et al., 1998; Dijkstra et al., 2000; Van Hell and Dijkstra, 2002). In these studies, three factors were thought important to research into the transfer of lexical skills: (1) task demands and monolingual/intermixing experimental stimuli, (2) expected

language(s) for responding and the language of the instruction, (3) relative language proficiency. Clearly, the first two factors are related to language-nonspecific access (to be discussed in section 4.2) since language-nonspecific access claims that words presented in the L1 activate lexical information in an L2 in parallel. Besides, previous studies have concluded that only the third factor would be important in experiments on language transfer. For these reasons, the first two factors are discussed later and the discussion here concentrates on the factor of relative language proficiency. Since the results showed no significant difference between the performance of group 1 and group 2 in the form-meaning task, I would propose that fluency in an additional language (English) does not change the fact that another non-native language (Japanese) has an influence on the dominant language, i.e. Chinese in the present study, as long as proficiency in the relative language has reached at a certain level. This interpretation is consistent with the finding from Van Hell and Dijkstra's (2002) research where they have maintained that a weaker language can affect the dominant language as long as the proficiency of the non-native language is not too weak to exert any influence. Since all participants in group 1 and 2 in the current research have received at least three years of intensive formal training in Japanese, it would be expected that language transfer would be seen in their processing of bilingual/multilingual lexicon because their links between L1 and L2 systems have become strong enough for the effects to show.

Another issue in the analysis of the result patterns in relation to previous studies is the question of whether the degree of semantic relatedness between Chinese and Japanese would affect the rating scores. Zhang 張 (2010) and Lin 蘭 (2011) have proposed that the degree of semantic overlap between Chinese and Japanese lexical items reflects the likelihood of the occurrence of positive/negative transfer. In the current research, an interaction was found between stimulus type and group, Scores for polysemy stimuli and heteronymy stimuli

given by the three groups only differed in Chinese meanings, not in Japanese or novel meanings. The evidence here seems to weakly support Zhang's 張 (2010) and Lin's 蘭 (2011) studies according to which participants in group 1 and 2 should have been more sensitive to the polysemy category than the heteronymy category. It is, however, worth mentioning that students in group 1 and group 2 provided higher scores for Japanese meaning than Chinese meaning when a given stimulus was in the heteronymy category. This might be suggesting that in the mental lexicon of most students with Japanese learning experience, Japanese meaning has replaced the Chinese meaning of a lexical item as the most appropriate meaning even in an exclusively Chinese context. This finding is discussed for pedagogical purposes later.

The last piece of information from the statistical results to point out is that the interaction between group and type appeared only when the data was aggregated by item not by subject. I would suggest that individual differences might account for this divergence. For example, there were three participants in group 1 and one participant in group 2 who rated Japanese meaning relatively lower than the average. Conversely, two participant rated Japanese meaning relatively higher than the average in group 3. These individual rating scores could possibly contribute to the reduction of difference between one group and another.

4.2 Language Expectation and Language-Nonselective Access

To extend the interpretation of the findings, one might wonder how these findings could apply to the fundamental frameworks introduced in the current research. First of all, let us return to the discussion on language-nonselective access in terms of the three main factors that have been thought important to the study of language transfer as pinpointed in a series of studies by Dijkstra and his colleagues (Dijkstra et al., 1998; Dijkstra et al., 2000; Van Hell and Dijkstra,

2002). As one of the three factors has been discussed earlier (the language proficiency factor in section 4.1 above) it remains to consider two factors: (1) task demands and monolingual/intermixing experimental stimuli, (2) expected language(s) for responding and the language of the instruction.

According to the concept of language mode (Grosjean, 1997) discussed in the literature review, the relative activation (and thus the degree of language selectivity) of the bilingual/multilingual lexicon depends on whether speakers find themselves in a more bilingual or a more monolingual situation. In the current study, the participants were presented with purely L1 contents, both in the introduction and the task contexts, and were highly encouraged to set up a monolingual native-language mode for the form-meaning mapping task—they were not made aware that their L2 knowledge was important for the study. Nevertheless, their performance showed the L2 system was automatically activated and influenced their L1 system. The evidence lay in the significant difference between the two groups with Japanese learning and the other group without or with minimal Japanese experience. Such divergence should not have been found if the participants were in a monolingual mode, namely the native language, if the concept of language mode was correct.

This finding has a twofold interpretation. On one hand, this finding is inconsistent with the language mode concept in which the deactivation or inhibition of L2 system should occur if the L2 is a non-target-language in a monolingual L1 situation. In that sense, the relative activation and thus the degree of language selectivity does not depend on whether the language mode is in a monolingual or non-monolingual setting, or rather, the activation/deactivation of language system is not an all-or-nothing option to be selected. This is consistent with the notion of language-nonselective access, which states that knowledge

from both target and non-target languages will be activated even if the lexical entries are from one language only (Van Hell and Dijkstra, 2002). On the other hand, this finding indicated that neither the language(s) used for experimental stimuli nor the language used in the task instruction would change the fact that the linguistic processing system of a bilingual/multilingual is profoundly nonselective with respect to language—the participants in current study were instructed to use their L1 and were presented contents in the L1 only in the task.

This finding of language transfer can be accommodated by the notion of language-nonselective access and can further be interpreted as strong evidence in support of the common-sense belief that L2 system is linked with L1 lexicon in the L2 vocabulary acquisition. Very often cross-linguistic interference occurs at the stage where L2-L1 lexical links are used by learners to form the semantic and grammatical information relating to L2 words from their L1 knowledge (Jiang, 2002). Moreover, the reliance on L2-L1 lexical links is very likely to block successful vocabulary learning that leads to advanced L2 proficiency. Hence, I propose that such links between the L1 and L2 lexicons may account for why words from both the L1 and L2 will be activated in the bilingual/multilingual mental lexicon even in a purely L1 or L2 context, as described by the notion of language-nonselective access.

4.3 Language-Specific Issues

As the results demonstrated, those participants with Japanese learning experience in the form-meaning mapping task provided higher rating scores on Japanese meanings than Chinese meanings when the corresponding orthographic word was from the heteronymy category. There might be two kinds of explanation for such finding. One of them is presented in the next section. Here I suggest a language-specific reason which may attribute to those

higher scores of Japanese meanings.

As Kawasumi 河住 (2005) highlighted, Chinese native speakers tend to interpret a word with Chinese characters in the way it is used in Chinese, even when the word appeared in exclusively Japanese context. The explanation for this was that the orthographic presentation of Chinese character (all Chinese characters are logograms) is so powerful that once the orthographic form of a character has been recognized, native speakers tend to automatically think they already know this word and immediately come up with the Chinese meanings which correspond to it, regardless of the fact that the context was Japanese. Such ‘image power’ was discussed earlier in section 2.3.2. I further hypothesize that the influence of the orthographic representation of a Chinese character might be reversible in a Chinese context, and this would make users of Chinese or Japanese pay less attention to the distinction between Chinese and Japanese meanings. In other words, the unique orthographic representation of Chinese character might shorten the distance between a Chinese word and a Japanese word with the same orthography even when the actual distance between them is much larger with respect to the semantics. The Japanese learners in the current research have spent plenty of time on the connection between Chinese characters and Japanese meanings in their intensive Japanese education. If they do not pay extra attention to the gaps between the Chinese and Japanese meanings of words with identical orthography, they may easily start to link Chinese characters with Japanese meanings even in a exclusively Chinese context. In cases like this, Japanese meanings might first come to their minds and they might, therefore, provided higher rating scores when they read the Chinese characters in the form-meaning mapping task.

4.4 Pedagogical Implications

One note-worthy difference between L1 and L2 vocabulary acquisition is the fact that a previously created conceptual/semantic network based on the L1 system links with the learning of L2 words. When an L2 word has an orthographically identical item in the L1, its link to the L1 lexicon seems more obvious as learners have recognized the orthographic representation long before the L2 vocabulary acquisition—they do not have to relearn its orthography. For this reason, an L2 word with an orthographically identical L1 item is very likely linked directly to the L1 lexical item, and the semantic, syntactic, and morphological information within the L1 item is transferred from the L1 lexicon to the L2 lexicon (Kawasumi 河住, 2005). Such a mechanism would cause no problem but only positive transfer, if the L2 word is identical to its competitive L1 item not only in orthography but also in semantic and syntactic (and, but not necessarily, morphological) specifications. Language transfer in an instance like this helps L2 learners to achieve advanced proficiency. However, the transfer would have negative effects if the L2 word was identical with the orthographic representation of the L1 item but differed in other specifications. This was the case portrayed in the current research. Such negative transfer can be commonly found in grammatical errors made by L2 learners. Since such errors are frequently seen in the SLA situation and have been addressed in a broad range of linguistic studies (as the errors could result from semantic, syntactic or morphological ungrammaticality), I devote this section to a separate discussion on the topic of language transfer from the pedagogical perspective and suggest some strategies that may help learners to avoid pragmatic errors caused by negative transfer.

Cross-linguistic interference (or negative transfer) will inevitably occur in L2 learning if the learner cannot bridge the pragmatic gap between the L1 and L2. Because the present study looks at language transfer at the lexical level, the discussion for LT purposes concentrates on pragmatic errors on the lexical level, especially on issues of the form-meaning mapping even

though it is sometimes impossible not to take syntax and morphology into account.

In general, there are two types of conditions that are very likely to make it difficult for L2 learners to establish a correct form-meaning mapping if divergence exists within relative languages. One type is constraints from internal conditions and the other is from external conditions.

4.4.1 Internal Constraints on L2 Vocabulary Acquisition

At the initial stage of acquisition, the L1-L2 link may be a relatively easy pathway to learn L2 words as it seems to be efficient and those new words can be used with some fluency. This is so because the new words have L1 equivalences which assist the learner and existing conceptual contents which can be copied to their lemma. However, the situation may vary at the next stage of acquisition depending on the degree of semantic overlap. Due to the L1-L2 link, the conceptual contents from the L1 lexicon may remain for an extended period of time. If an L2 word shares a high degree of semantic overlap with its L1 equivalent there should not be any pragmatic problem. If there is a semantic gap between the two lexical items and the knowledge of the L2 word is fossilized at a certain level as the L1-L2 link becomes stronger, this is very likely to lead to inaccurate use of the language (Jiang 2000). Such tendency can be seen on the participants in the current study who are not beginners but not yet advanced learners of the L2, namely Japanese.

As has been mentioned earlier, there is a relatively short distance between Chinese and Japanese both orthographically and also pragmatically. As a result, speakers who know both languages tend to interpret words sharing the same characters as the same meaning without considering whether any semantic gap exists between Chinese and Japanese (Kawasumi 河住,

2005; Yamato 大和 and Tamaoka 玉岡, 2009). As has been pointed out by Yamato 大和 and Tamaoka 玉岡 (2009), errors caused by the semantic gap between Chinese-Japanese false friends could not only be found in speakers with lower L2 proficiency but also among advanced L2 learners. Learners have to be cautious about the semantic gap between Chinese and Japanese in order to avoid negative transfer resulting from the divergence.

4.4.2 External Constraints on L2 Vocabulary Acquisition

In addition to the internal constraints on L2 vocabulary acquisition, the nature of the conditions in which an L2 is learned can sometimes be an external constraint on successful L2 vocabulary acquisition. As was discussed in section 2.2.2, the learner's exposure to L2 is hardly comparable to the input received by an L1 learner with regard to both its quality and quantity. Since much L2 learning takes place in the classroom, the chance for learners to use their L2 is often limited. The poverty of L2 input may constrain the extraction of completely lexical information from the L2 context. Consequently, learners may not be able to recognize the minor differences between the L1 and L2 which give rise to false friends.

On the other hand, most L2 textbooks used by teachers and learners do not see conscious learning of the semantic gap as an important point in SLA. As Lin 藺 (2011) points out, Japanese textbooks generally have a tendency towards the acquisition of grammar and vocabulary, while for vocabulary acquisition the focus is on pronunciation and semantics. However the meanings given in textbooks are of course limited to the meanings in the contexts of the textbook rather than all the meanings of the vocabulary in the L2. Because such a method of vocabulary acquisition would not activate lexical processing at a deep level, L2 learners could hardly obtain fully detailed lexical knowledge of a particular lexical item. This insufficient knowledge makes it difficult for L2 learners to bridge the semantic gap.

4.4.3 Pedagogical Strategies

Although it is mainly the semantic gap between L1 and L2 false friends which contributes to learners using lexical items ungrammatically, lexical errors also have something to do with syntax and morphology. An example is the negative effects that can be found commonly in the translation work of L2 learners. Here I turn to a study by Lee et al (2007) which looked at translation mistakes made by native speakers of Taiwanese learning Japanese for the sake of providing some suggestions for pedagogical purposes with respect to language transfer at the lexical level in an efficient way. The study by Lee et al (2007) identified five main types of mistranslation: (1) coming up with a meaning by merely looking at the orthographic presentation, (2) improper omission of subjects, (3) unnatural expression in Chinese, (4) illegal use of traditional Chinese characters, (5) negative transfer of Taiwanese dialects. Although all these points reflect the kinds of language transfer which can occur in translation tasks, for the specific purpose of the current study, we restrict the discussion here to Lee et al's points (1) and (3), which are discussed in order to identify pedagogical counter plans in association with the present study. The aim of this discussion is to provide suggestions for avoiding negative transfer caused by the gap between Chinese and Japanese false friends.

Because Chinese characters are shared between Chinese and Japanese, Chinese native speakers can learn a large number of Japanese words with ease, and vice versa. For the same reason, however, users of Chinese and Japanese languages can easily get confused about the distinction between Chinese and Japanese meanings of words with the same orthographic presentation. This is especially true when the semantic divergence is minor. From the pedagogical stance, it would be important to remind learners to always pay attention to the distinction between Chinese and Japanese meanings; this would be a conscious learning

strategy. At the same time, teachers might want to teach a particular lexical item as a whole in one language (giving as much detailed lexical information as possible) rather than a character-to-character or word-to-word mapping/translation (Lee et al., 2007). In this way, the users of Chinese and Japanese would stop using a Chinese-Japanese false friend with meanings in one language in the wrong contexts in the other language because they would become cautious about the semantic gap between the two languages. In this sense, they would be able to avoid errors caused by negative transfer (either forward or backward) that resulted from the two types of constraints on successful vocabulary learning mentioned earlier.

The other important tendency found in the study of Lee et al (2007) was that students had some unnatural expressions in terms of translated words. It was postulated that ignorance about proper use of Chinese would contribute to such result—native speakers use unnatural or ungrammatical expression in the L1. Similarly, the results of the current research showed the participants rated Japanese meanings higher than Chinese meanings for one certain stimulus type. This may suggest that these participants more or less confused Chinese meanings with Japanese meanings in the form-meaning mapping task—this is another possible explanation to account for this finding apart from the language-specific explanation offered in section 4.3. It would be necessary to make the effort to clarify how a word is used in Chinese and how it is different from its use in Japanese in order to avoid mistakes caused by backward transfer, even though the learners of Japanese might primarily focus on the knowledge in the L2, namely Japanese.

In spite of the links between L1 lexicon and L2 system and the fact that lexical processing in a bilingual/multilingual mind has a language-nonselective access, it may still be possible for learners to avoid pragmatic errors caused by language transfer within the L1-L2

interconnection through conscious learning of detailed lexical information. In this case, teachers would want to adjust their teaching approaches. There are two general teaching approaches for L2 vocabulary acquisition, which may be distinguished according to the purpose of conscious learning: *word association approach* and *contextualized approach* (see Jiang, 2000). In the word association approach, the meaning of an L2 word is not ‘discovered’ by learners themselves but told to them by teachers, normally with its L1 translation. The contextualized approach, on the other hand, emphasizes the value of exposure to L2 vocabularies in L2 context. These two approaches vary in terms of the contents of L2 input (in the ways identified in the discussion of external constraints above). The word association approach does not stress the provision of contextualized input and the learners are encouraged to rely on their L1 knowledge. As noted in the discussion of external conditions, vocabulary acquisition through the word association approach may only give a learner limited knowledge of an L2 word. Although the contextualized approach seems to provide better conditions for L2 vocabulary acquisition, there are still some doubts about this teaching approach. It is not clear, for instance, to what extent confusion about different semantics between L1 and L2 can be avoided or at least reduced when learners concentrate on an exclusively L2 context. If the links between the L1 lexicon and the L2 system are inevitable, should teachers still make the effort to avoid relying on L1 translations? More practically, L2 learners might not always be able to guess the meaning of a L2 vocabulary from context and this is an inefficient method of learning new L2 words.

4.5 Limitations of the Current Study

Although the findings of the current research have demonstrated that L2 vocabulary acquisition has effects on L1 lexical knowledge, the interpretation of the results has its limitations. There are four main points that can be discussed for the potential improvement in

the further studies.

First, the present study specialized in backward transfer occurring in the processing of form-meaning mappings. However, phonology, as one element of lexical item in the mental lexicon, was not discussed due to the nature of the experimental design. There are false friends in Roman alphabet languages that are identical, or at least similar, not only in orthography but also in phonology. Hence, a certain number of previous studies of form-meaning mappings in Roman alphabet languages have taken phonology into account. False friends in Chinese and Japanese could be a different case because the Chinese pronunciation of a false friend is rarely completely the same as its Japanese pronunciation. This does not necessarily mean that phonology has nothing to do with language transfer in form-meaning mappings between Chinese and Japanese, however, as the gap between orthographic and phonological mapping may still lead to transfer in the L2 vocabulary acquisition (Yamato 大和 and Tamaoka 玉岡, 2009). There is therefore still a need for further studies to clarify the role that phonology plays in language transfer in Chinese-Japanese bilingualism.

Secondly, the collection of stimulus items did not take frequency into account. The 24 words that represented different explanations in Chinese and Japanese were chosen from the textbooks used by participating students at the department of Japanese culture and language. Although this method guaranteed that these students had learnt and were using the 24 words in a Japanese context, it is not known how often these words appeared in their Japanese acquisition and use. Word frequency has been considered in some previous studies. For instance, the stimulus materials in the research by Dijkstra et al. (2000) were organized into two groups according to the summed frequencies across all syntactic categories involved.

Although Dijkstra et al.'s study of false friends focused on the language(s) of the test context and its instruction in the first place, which was slightly different from the primary targets of the present study, word frequency might still be a point to consider in future studies.

Thirdly, due to time constraints, the task in the current experiment was administered twice, to two whole classes of students at once, instead of testing each participant individually. This experimental method made it difficult to record the individual RT of each participant for each set of stimulus materials. Normally RT reflects the processing of an L2 word and tells whether inhibition or facilitation has occurred when the word has an identical or similar meaning in the L1. For example, one previous study on cross-linguistic overlap in semantics, phonology and orthography by Lemhöfer and Dijkstra (2004) showed RT differences between homographs and non-homograph controls. The results of the current experiment would be more convincing if the experimental design allowed us to measure individual RTs in the form-meaning mapping task.

The last point is the experimental setting of relative language proficiency discussed earlier. The results of the current research appeared to be consistent with the finding in Van Hell and Dijkstra's (2002) study, where they stated that a weaker language could affect the dominant language as long as the proficiency of the non-native language was not too weak for the effects to appear. In their study the minimum fluency of the weaker language was fixed as the French proficiency of participants who had learned French for six years. In the present study the participants had three years of experience of Japanese language. This provides evidence that could support Van Hell and Dijkstra's statement and as the minimum fluency is reduced from a six-year learning experience to a three-year. However, it still remains unclear what level of language proficiency would be too low to indicate noticeable effects of a weaker

language on the processing of the dominant language.

5 Conclusion

5.1 Conclusion and Future Studies

The present study has investigated backward transfer at the lexical level by exploiting the gap between semantics and orthography mapping in Chinese and Japanese. In order to show the influence of L2 acquisition on L1 knowledge, the Chinese competence of 79 Taiwanese students (including 12 students whose language learning background did not fit the requirements of the present study and thus their data were discarded in the statistical analysis) with and without experience of Japanese learning was tested in a form-meaning mapping task. The results showed that when the native speakers of Chinese knew Japanese, their lexical knowledge in Chinese was affected by their acquisition of Japanese vocabulary. This indicates that cross-language influence of the L2 on the L1 can occur. Since the language of the task context was exclusively Chinese, the results also provided evidence in support of the notion of language-nonspecific access. The findings of the current research strengthened and extended this notion in an important way, because the parallel activation through language-nonspecific access also holds for the reverse situation: the semantic judgement in L1 was found to be influenced by the presence of L2 semantic candidates. The value of the present study is apparent as little research about such backward transfer is available (and most research on related topics is limited to Roman alphabet languages).

The findings of the current study were interpreted in two directions, one for LT implications and the other for the discussion on language specificity. The present study has thrown light on the topic of the backward transfer of lexical skills. It has also contributed to an understanding

of lexical transfer in Chinese-character-based languages, for instance, the potential effects of the image of Chinese character on the phenomenon of language transfer. Nonetheless, more studies in this topic are still needed in order to obtain language-specific evidence from cases which are not Roman alphabet languages. From the phonological viewpoint, for example, it can be discussed what role homophones may play in linguistic effects across Chinese and Japanese. Can cognates with distinct Chinese characters in different scripts (for example, traditional Chinese character versus Japanese Kanji) be discussed as examples of cognates with non-identical orthography in Roman alphabet languages for the studies in cross-language influence? Does cognate facilitation, which occurs when Roman alphabet languages represent non-identical but similar cognates also occur with Chinese/Japanese words in the polysemy category where a pair of words is not semantically identical but largely similar to each other?

Finally, considering the limitations in terms of the experimental design in present study, any similar experiment in the future may want to take RT, word frequency and relative language proficiency into account in order to come to a more comprehensive understanding of this topic.

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Appendix

Stimulus materials

Polysemy category			
Item	Chinese/Japanese meaning	Japanese meaning	Novel meaning
1. 意味	meaning of (doing) a thing	meaning of a word	interest of (doing) a thing
2. 外人	people who do not belong to one certain group/circle	foreigners	people who are careless of things not beneficial to themselves
3. 十分	very/quite	not in an insufficient situation	filled with something
4. 料理	cuisine/dishes	to cook	the process of cooking
5. 圏外	out of one certain group/area	out of an area where the reception is good	being at a foreign place
6. 結局	outcome/result	eventually	The final set of a match
7. 人間	the world of mortals	human beings	humanity
8. 是非	right and wrong	whatever happens	gossip
9. 監督	to supervise	supervisors	organizers
10. 約束	to restrain	(to make) a deal	promise
11. 掃除	to extinguish/eliminate	to clean	to drive out evil spirits
12. 注意	to pay attention to something	to get attention	to concentrate

Table A1.1

Heteronymy category			
Item	Chinese meaning	Japanese meaning	Novel meaning
13.質問	to query	a question	to express concern about something
14.徹夜	all through the night	to stay up all night	late night
15.用意	attempts	to prepare	instruction
16.深刻	unforgettable	serious	deep-rooted
17.新聞	news	newspapers	something new/fresh
18.一番	at a certain level	first	(something happens) one time
19.趣味	interest	hobbies	humour
20.野菜	edible wild plants	vegetable	uncooked vegetable
21.家族	family	family members	a wealthy family
22.引退	to resign	to retire	to quit a job with anger
23.迷惑	confusion	annoyance	not being smart
24.丈夫	husband	robust	being more brave than wise

Table A1.2