The attribute of language-switching in Chinese–Japanese bilinguals’ word recognition

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Two monolingual lexical decision tasks and a cued language-switching task were used to explore the cognitive processing of two-Chinese-character compound words in proficient Chinese–Japanese bilinguals. The results showed one-way facilitation and inhibition from L1 to L2 when bilinguals performed lexical decision tasks in both languages, respectively. Interactive interference and facilitation were observed in when sporadic language-switching is required.

Key words: Chinese–Japanese bilinguals, language-switching, language set

Bilinguals can switch from one language to the other in daily conversation without hesitation. How do they control their both languages? According to Green (1998), it is the language schema (or language set) which regulates the output from the word recognition system by altering the activation levels of representations. If a language schema is in charge of language activation, then will manipulating the levels of language schema activation influence bilinguals’ language processing? This is one of the questions we explored in the present study.

Another question that we examined in this study is whether bilingual lexical access is language-selective. There might be an interaction between lexical processing in both languages, especially when the two languages share most parts of a common writing system, such as Chinese and Japanese. Although Chinese and Japanese belong to different linguistic families, and differ greatly in grammar, both languages use Chinese characters (Kanji) in morphological representations. There are many words that are identical in the Chinese and Japanese language at both graphemic and semantic levels (cognates). How will the similarity in morphological representations affect cognitive processing by Chinese–Japanese bilinguals? In the present study we examined bilinguals’ language switching in Chinese and Japanese, focusing on the comprehension of visually presented words.

Method

Stimuli and Tasks Four types of two-Chinese-character (Kanji) compound words were used as stimuli: (1) words that are identical in Chinese and Japanese at both graphemic and semantic levels (cognates); (2) words specific to Japanese which do not have semantic meaning in Chinese (Japanese words); (3) words specific to Chinese, which do not have meaning in Japanese (Chinese words); (4) non-words in either language (pseudo-words). There were 25 stimuli of each type. All of the single Chinese characters (Kanji) that appeared in each compound word had the same morpheme in both Chinese and Japanese. The frequency and familiarity of stimuli were strictly controlled.

Two monolingual, lexical decision tasks (one in Japanese and the other in Chinese), and a cued language-switching task, were conducted. In the monolingual lexical decision tasks, a total of 100 stimuli, were presented in white at the center of a black computer screen background. The cued language-switching task had 200 trials, with 100 stimuli presented twice, one time in a green color, the other in a red color. The color of the stimuli told the participant in which language the lexical decision should be made, depending on the instructions.

Participants The participants were 18 native speakers of Chinese with an advanced level of Japa-
Japanese and 14 native speakers of Japanese with an intermediate level of Chinese.

Results and Discussion

The reaction times of correct responses for the word conditions and the non-word conditions were analyzed separately using t-tests. The mean response times are shown in table 1.

The responses to word conditions in monolingual tasks are discussed first. The cognates were processed significantly faster than those words specific to L2 [Chinese bilinguals, \(t(17)=3.08, p<.01\); Japanese bilinguals, \(t(11)=2.60, p<.05\)]. The results indicated a one-way facilitation effect from L1 to L2. An opposite facilitation or inhibition effect from L2 to L1 was not revealed. This result indicates that bilinguals can effectively activate the conceptual representation via both Chinese and Japanese orthographic representations, facilitating the lexical processing in L2. However, their processing in L1 was not affected by the L2 lexical status. Regarding the responses to non-words, pseudo-words were much harder to reject as non-words when bilinguals performed the lexical decision task in L2 compared to L1 [Japanese bilinguals, \(t(11)=3.12, p<.01\)]. Moreover, Chinese bilinguals were affected by L2 lexical status as indicated by the correctness of their lexical decisions. It suggests that lexical candidates from the task-irrelevant language are activated, which indicates that lexical access is not language-selective.

With respect to the cued language-switching task, interactive interference and facilitation were revealed between the bilinguals’ two languages, not only from L1 to L2, but also in the opposite direction. Cognates were processed significantly faster than

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words specific to one language [Chinese bilinguals, \(t(17)=4.55, p<.01\); Japanese bilinguals, \(t(10)=2.42, p<.05\)]. Slower responses and more errors were made to non-words specific to the current task-relevant language than to pseudo-words [Chinese bilinguals, \(t(17)=5.06, p<.01\); Japanese bilinguals, \(t(10)=4.66, p<.01\)]. Since cognates have identical orthographic and semantic representations in both languages, they were simultaneously activated via both Chinese and Japanese, resulting in faster responses.

However, slower responses to language-specific words could also be interpreted as the result of inhibition from the task-irrelevant language. For example, Chinese words are non-words in Japanese, and a “No” response based upon Japanese is correct. This “No” response from Japanese is accompanied even if in Chinese lexical decisions where Japanese is not the task-relevant language. In contrast, responses to cognates are always “Yes” in both languages, resulting in faster processing. Furthermore, the simultaneous activation of two languages also strongly interfered with responses to non-words. When a bilingual was making a lexical decision in one language, words specific to the other language were also activated at the same time. Consequently, an inhibitory control of the non-response language would be needed, which resulted in a slower response when the non-words were words specific to the other language.

Reference