廖家萱　　國立台灣師範大學英語學系研究所語言學組
論文題目(中文)：句尾非預期效應對語句處理的影響：事件相關腦電位研究
論文題目(英文)：Unexpected ending in sentence processing: An ERP study
指導教授：詹曉蕙

Abstract

In the current study, we investigated how people processed sentences with an unexpected ending as well as how people processed sentences switched between languages of different dominance. We used the event-related brain potentials (ERP) technique, which measured neural activity at millisecond level and provided biological evidence on sentence processing. The participants were simultaneous Mandarin-Taiwanese bilinguals, who acquired both Mandarin and Taiwanese at the same time but used Mandarin more frequently. Participants' language background (age, gender, and language use) was carefully controlled. In addition, due to the fact that we presented experiment stimuli in an auditory modality, tone sandhi rules in Mandarin and Taiwanese were taken into consideration when constructing experiment stimuli.

For the first line of the inquiry, we manipulated two types of unexpectedness—sentences that were terminated with an unexpected concept and sentences that were completed in an unexpected language switch. Although a large body of psycholinguistic/neurolinguistic literature had examined predictability of sentence processing, the underlying mechanisms for processing an unexpected concept and an unexpected language switch remain unclear, because most existing studies investigated each type of unexpectedness respectively. In the current study, we demonstrated that concept and language expectations exerted their influence on sentence comprehension independently due to different brainwave responses they elicited. While an unexpected concept elicited a typical central-parietal N400, which usually indicated difficulties in semantic access, an unexpected language switch generated a widespread N400 and a sustained frontal negativity, showing that in addition to difficulties in lexical access, cognitive control was recruited to monitor higher-level language modes. These findings provided empirical data on bilingual sentence processing and could shed some light on the development of (bilingual) sentence processing models.

For the second focus of the current study, we investigated how Mandarin-Taiwanese bilinguals processed sentences of different switching directionality (i.e., switching from Mandarin to Taiwanese vs. switching from Taiwanese to Mandarin). Such an exploration is a follow-up study of our previous psycholinguistic experiments (Liao & Chan, 2011, 2012), in which we found while sentences switched from Mandarin (dominant language) to Taiwanese (less dominant one) were more difficult to the participants (as indicated by longer response time), sentences switched from Taiwanese to Mandarin was as easy as non-switched sentences. The finding of the current study was generally inline with our previous ones, but with more solid biological evidence—the brainwave responses revealed when switching into Taiwanese (less dominant language), participants encountered difficulties in lexical

access. Moreover, participants might recruit additional brain regions to suppress representations of the dominant Mandarin, so that they could successfully interpret the meaning of the code-mixed sentence. We suggested that since Mandarin was more frequently used, it could be more active in the participants' mind and thus was easier to retrieve. While existing language switching studies had mainly focused on switching between participants' first language (L1) and a later-learned language (L2), we recruited participants who were simultaneous Mandarin-Taiwanese bilinguals with more frequent use in Mandarin and demonstrated that language dominance could modulate a switching cost in online sentence processing.