EMBODIED PROCESSING of L2 EMOTION-LABELED WORDS for LATE CHINESE-ENGLISH BILINGUALS

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Embodied Cognition postulates that semantic knowledge is grounded not only in heteromodel regions in our brain, but modality-specific cortical regions responsible for the coding of perceptual, sensory and motor experience. The processing of words can activate sensory-motor experience that semantic knowledge is based on (Lakoff & Johnson,1980; Barsalou 2008; Annoni *et al*，2022).

Studies using behavioral, electrophysiological and neuroimaging methods show the interaction between sensory-motor experience and words understanding, as well as the activation of sensory-motor area of the brain during the verbal processing (Barsalou & Wiemer-Hastings, 2005； Bergen 2012, 2016; Harpaintner *et al.* 2020; Zanolie *et al.* 2012). However, evidence concerning the embodiment of words are mainly from concrete concepts, whether abstract concepts, such as emotion, are embodied is still controversial, and embodiment of second language in bilingual speakers has been much less addressed.

In the present study, we focus on the embodied processing of emotion-labeled words in late Chinese-English bilinguals whose English is at intermediate level with L1 Chinese as dominant language. Specifically, we aim to examine whether sensor-motor experience of vertical space and color is activated during processing of in English emotion words. If embodied theory is applicable in second language learning, there should be an interaction between vertical space, color and emotional words in English, as it is in Chinese.

30 Chinese-English Bilinguals were selected to participate in the Emotional Categorization task. 36 Chinese and 36 English emotion-labeled words were chosen as stimuli: half of them positive and half negative. The lexical and psychological factors such as arousal, concreteness, word length, and frequency of stimuli were tightly controlled. Results showed that the processing time of L2 emotion words was significantly longer than native language, and the accuracy rate was lower than L1. most importantly, up-down space and red-blue color interfered the categorization of emotional words both in L1 and L2. The reaction speed was faster in congruent condition, when the mapping of response key and color emotion words was congruent with the metaphorical projection of emotional metaphor (positive-up/negative-down; positive-red/negative-blue). This suggests that second language is—at least to some extent—embodied. But for late bilingual who acquire the language in classroom settings and vocabulary is learned through explicit memory with less exposure to sensory-motor experience, the sensory motor involvement is less stronger than L1.