Language-specific Effects on the Processing of Mandarin and Cantonese Classifiers in Adult Early Bilinguals.

Helen Zhao[1] & Jing Yang[2]
[1]University of Melbourne, helen.zhao@unimelb.edu.au [2] Zhejiang University

Keywords: Linguistic relativity, Bilingual cognition, Categorisation, Language processing

Empirical evidence shows that learning an additional language can result in conceptual change in the speaker's mind in domains such as time, space, and motion events (Athanasopoulos et al., 2015; Cadierno & Robinson, 2009), categorization of objects and substances (Athanasopoulos, 2007; Cook et al., 2006), etc. The majority of the bilinguals in these studies were late bilinguals. Few studies investigated early bilinguals (Bassetti, 2007) who were children and may change their cognitive behaviours in adulthood.

The current study investigates language-specific effects in adult early bilinguals who have exposure to their first language (L1 Cantonese) and second language (L2 Mandarin) since birth. We compared Mandarin monolinguals (n = 35) with Cantonese-Mandarin bilinguals (n = 36), all of whom are adult university students in a southern city in China. The bilinguals' current dominant language is their L2 (Mandarin). The conceptual categorization by L2-dominant early bilinguals is rarely seen and particularly worthy of investigation. We examined how knowledge of Mandarin and Cantonese classifiers influences speakers' conceptual categorization. We administered several tasks including a similarity judgment task, a speeded phrase-picture matching task, a free recall task, a digit span task (to measure working memory), a Mandarin classifier naming task, and a Cantonese classifier naming task (bilingual only). Data were analysed using linear mixed models in R.

The results of similarity judgment and phrase-picture matching revealed a Mandarin classifier effect on object perception in both monolinguals and bilinguals. Object pairs with the same Mandarin classifier (e.g., *towel*, *necklace*: classifier *tiao*) were rated perceptually more similar and responded slower in the matching task than object pairs with different Mandarin classifiers (e.g., *match*, *toothbrush*: classifiers *gen* and *ba,* respectively). In similarity judgment, the monolinguals gave higher similarity ratings to object pairs with the same Mandarin classifier than the bilinguals. However, there was no group distinction on object pairs with different Mandarin classifiers (Figure 1). Cantonese classifiers did not yield a main effect in either task. We observed a marginal Cantonese classifier effect in the free recall task (Figure 2). Bilinguals produced a marginally higher recall score based on clusters of Cantonese classifiers than monolinguals, but the two groups did not differ in recall based on clusters of Mandarin classifiers. Working memory and classifier knowledge were not significant covariates.

The current findings align with previous studies of language-specific classifier effects. The amplified classifier effect revealed by group differences was observed in offline similarity judgment and free recall (Zhang & Schmitt, 1998), but not in fast-speed online processing (Huettig et al., 2010; Saalbach & Imai, 2012). A longer response latency in processing the same-classifier relation was also observed in previous research (Saalbach & Imai, 2007, 2012). The bilinguals demonstrated a clear pattern of L2-dominant categorisation, heavily influenced by their predominant use of the L2 in daily life. A significant reduction in L1 use might have caused the assimilation of L1 classifier knowledge to the L2. Bilinguals might have experienced a conceptual restructuring due to the semantic erosion of L1 categorisation and a conceptual shift to L2 categorisation.
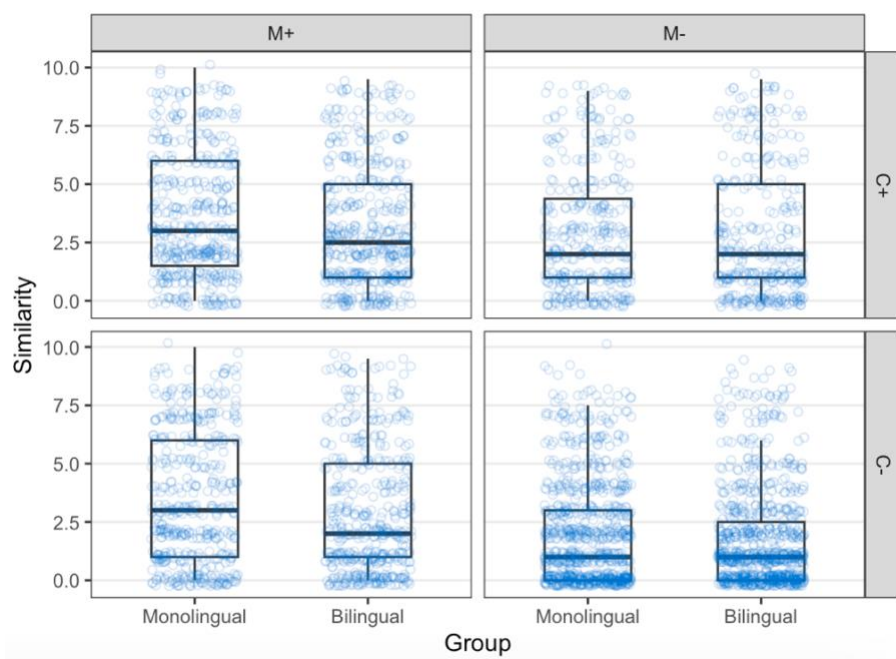
Fig. 1: Boxplots of similarity judgment by classifier condition and speaker group
Note: M = Mandarin, C = Cantonese
+ stands for the same classifier between the two objects in a pair
– stands for different classifiers between the two objects in a pair
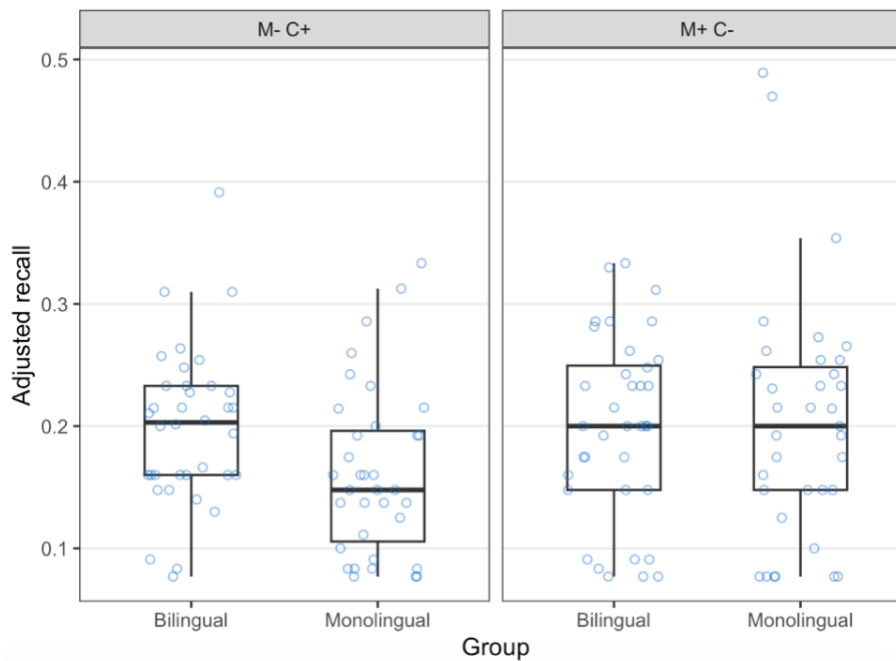

Fig. 2: Boxplots of adjusted recall scores (Pellegrino & Hubert, 1982) of the free recall task by classifier cluster and speaker group
Note: M- C+ stands for recall based on the Cantonese-classifier cluster
M+ C- stands for recall based on the Mandarin-classifier cluster