The Modulation of Mandarin Classifiers on Perception of Real-world Objects: A Neurolinguistic Approach

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Whether the language we speak has influence on our conception of the world has been widely discussed. Mandarin, as one of the languages that have classifiers, requires classifiers in most situations when Mandarin speakers want to refer to quantity of objects, such as *zhang* in *liang-zhang zhaopian* '*two-CL photo*' 'two photos'. A classifier categorizes a class of nouns involving either physically or functionally salient perceptual properties, which are permanently related to entities named by the class of nouns (Tai & Wang, 1990; Tai, 1994). To explore wonder whether Mandarin speakers' conception of objects is been influenced by those classifiers, we adopted the ERP technique with an oddball paradigm (i.e. presentations of sequences of repetitive stimuli interrupted by infrequent deviant stimuli and target stimuli, see Figure 1) to examine whether the knowledge of Mandarin classifiers, with part of them classifying objects by their dimension, would affect Mandarin speakers' visual perception. We created four conditions in our experiment, including (1) one-dimensional standards vs. within-dimension deviants, (2) one-dimensional standards vs. between-dimension deviants, (3) two-dimensional standards vs. within-dimension deviants and (4) two-dimensional standards vs. between-dimension deviants. The standards (probability 80%) were photos of objects with the same classifier, the within- or between-dimension deviants (probability 15%) were photos of objects with a different classifier from the standard one, and the targets were photos of a cat (probability 5%) (see Table 1). To see if there is a language effect, we have been recruiting both Mandarin and English native speakers as participants. We found P2 effect in the Mandarin speakers' group in both within-dimension deviants and between-dimension deviants against the standards; as for English speakers' group, we got preliminary result that the P2 effect was only seen in the between-dimension deviants against the standards. The P2 effect has been related to the allocation of attention and the initial conscious awareness of stimuli. Since the English group showed P2 only in between-dimension deviants against standards, not in within-dimension deviants against standards, it can mean that English speakers use the shape of objects to distinguish the stimuli. While for Mandarin speakers, they showed P2 in both situations, which can indicate they use not only shape but Mandarin classifiers to categorize the stimuli. It can be taken be a support that Mandarin speakers' visual perception may be affected by classifiers.

Keywords: linguistic relativity, Mandarin, classifier, oddball paradigm, ERP, P2

References

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Table 1. Experiment design (standard: 80%, deviant: 15%, target: 5%)

One-dimensional			Two-dimensional		
Standard *tiao*	SA1 road	SB1 belt	Standard *zhang*	SC1 paper	SD1 playing card
	SA2 scarf	SB2 net cable		SC2 chair	SD2 certificate
	SA3 chain	SB3 tie		SC3 credit card	SD3 bed
	SA4 toothpaste	SB4 railway		SC4 record	SD4 map
Within-dimension deviant *gen*		DA banana	Within-dimension deviant *mian*		DC mirror
Between-dimension deviant *pian*		DB maple	Between-dimension deviant *zhi*		DD microphone
Target		TA cat	Target		TA cat

Figure 1. Stimulus presentation of an oddball paradigm in the present experiment