

Sensitivity to classifier relation in a priming task

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Abstract

Chinese speakers were often found to show sensitivity to classifier rules and semantics through the lens of cognitive processing tasks, which is the purported “classifier effect”. However, it remains unclear whether the classifier effect is reflective of the linguistic sensitivity or universal conceptual structuring. To scrutinise this, a linguistically implicit mediated priming task was administered to assess differences in sensitivity to information contained within classifier-related pairs. Results showed that Chinese ($n = 35$, female=29, Mage=24.16, SD=2.58, age range:18-31) and English ($n = 35$, female=26, Mage: 22.31, SD=2.71, age range:19-28) L1 speaker groups both produced more “yes” responses on semantic pair trials when being asked to decide whether the prime and the target were associated with each other. Although both L1 groups performed comparably in responses under all task conditions, it only took Chinese speakers longer time to determine grammatical pairs than English speakers. Findings together support an “implicit classifier effect” from Chinese speakers’ performance.

Keywords: Chinese classifiers, classifier effect, mediated priming, linguistic sensitivity, conceptual structure, linguistic relativity

Introduction

Chinese classifiers, serving as reference-tracking devices for nouns, categorize objects based on intrinsic properties such as shape, animacy, function, and social status (Zhang, 2007). The majority of Chinese classifiers (hereafter, abbreviated as classifiers unless specified otherwise) denote the canonical semantic features of their matched referential objects (Zhang, 2007). For instance, the classifier “tiao” (meaning long and flexible by its character) often corresponds to referents with long and flexible features, such as a rope and a river. Chinese speakers have been observed to conceptualize objects sharing the same classifier as more similar to each other than those assigned different ones.

In this study, we aimed to explore whether the potential classifier effect could be observed in a speeded automatic processing condition. Inspired by the intrinsic meaningful connection between classifiers, the features of classifiers, and their objects, our research design links them through a semantic priming paradigm (Figure 1). The incorporation of classifier relations within a mediated

priming task holds the potential to unveil the elusive relationship between a classifier, its semantic primitives, and the objects it is associated with.

Method

Participants

Participants were 35 Chinese (female=29, Mage=24.16, SD=2.58, range:18-31) and 35 English (female=26, Mage: 22.31, SD=2.71, range:19-28) speakers.

Materials

Mediated priming refers to the conceptual activation of a target by a prime, connectively preceded by a mediator. In this study, the mediator was created according to each classifier's canonical semantic feature (see Gao, Malt, 2009).

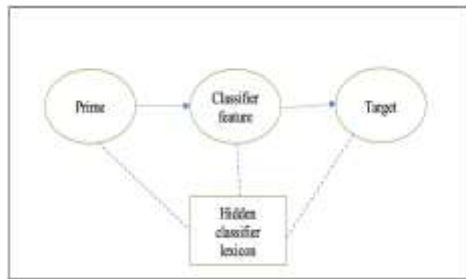


Figure 1. The conceptual overview.

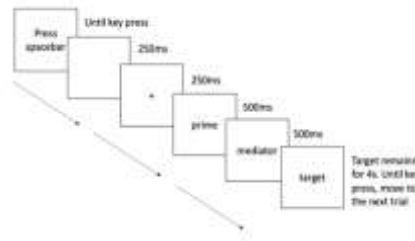


Figure 2. Flow of the experiment.

Three conditions were developed aligned with the combination of “G” relation (grammatically match) and “S” relation (semantically match) as in Tsang and Chambers (2010). G+S- pairs are those with the prime and the target taking the same classifier, but the target's feature did not fully match their prime's canonical feature (as indicated by the mediator), such as “tunnel-long-shorts” (although classifier *tiao*'s feature is <long>). Therefore, the target lacks the feature in the mediator. Accordingly, in G-S+ pairs, the targets were grammatically illegitimated with the primes (i.e., taking different classifiers), but matched the prime's canonical feature such as “rope-long-lipstick”. Namely, although rope and lipstick are associated with different classifiers, their classifiers' canonical feature is <long>. G-S- pairs (fillers) denoted neither classifier association nor semantic feature such as “leg-long-fan”, as the baseline of comparison.

Table 1. Stimuli examples for the priming task (English version).

Prime	Mediator	Target	Classifier	Relation
tunnel	long	shorts	tiao2	G+S-
rope	long	lipstick	tiao2	G-S+
leg	long	fan	tiao2	G-S-

Procedures

Participants were individually tested during a single online session using Gorilla. See task procedure in Figure 2. During the task, participants were instructed to determine whether the target was related to the first word by pressing the J key for “yes” and the F key for “no” on keyboard. Participants were encouraged to respond both quickly and accurately.

Results

A logistic mixed-effects regression model was fit for response analysis. A “yes” response was coded a “1” and “no” for “0”. No interaction was found between L1 and relation (Figure 3). However, within the Chinese group, the “yes” response for G+S- pairs (the intercept, $\beta = -0.596$, $SE = 0.139$) was significantly lower than for G-S+ pairs ($\beta = 0.546$, $SE = 0.106$, $p < 0.001$), but significantly higher than for G-S- ($\beta = -0.944$, $SE = 0.115$, $p < 0.001$) pairs. Similarly, within the English group, the “yes” response for G+S- pairs (the intercept: $\beta = -0.600$, $SE = 0.138$) was significantly lower than for G-S+ pairs ($\beta = 0.546$, $SE = 0.206$, $p < 0.001$); whereas it was significantly higher than for G-S- pairs ($\beta = -0.728$, $SE = 0.233$, $p < 0.01$).

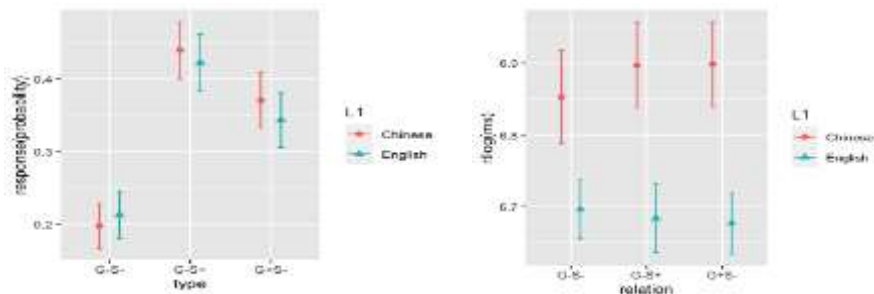


Figure 3. Response across L1 and Figure 4. RTs across L1 and relation.

RTs were log transformed before modelling. Results from a mixed-effects linear regression model again showed no interaction between L1 and relations (Figure 4). However, Chinese speakers only spent more time than their English counterparts in the processing of G+S- ($\beta = -0.253$, $SE = 0.248$, $p < 0.05$) pair condition, but not in G-S+ or G-S- pair conditions.

Discussion

Both groups performed similarly in the G+S- pair condition, contrary to previous studies that integrated a sentential context for classifier concept retrieval (e.g., Grüter et al., 2020). This discrepancy might be explained by

Chinese speakers' reduced sensitivity to classifier concepts in fast-paced lexical tasks (cf. Leung & Williams, 2014). Additionally, there was no significant response difference in the G-S+ pairs between the two L1 groups, indicating a reliance on semantic information, contrary to Tsang and Chambers (2010), who reported Cantonese speakers rigidly adhering to grammatical constraints over semantic ones.

Concerning response times (RTs), Chinese speakers took significantly longer to process G+S- pairs than their English counterparts. This suggests heightened competition in the G+S- condition, attributed to Chinese speakers' sensitivity to classifier relations (Leung & Williams, 2014). Therefore, akin to Speed et al. (2021), we conclude that classifiers reflect but do not significantly influence Chinese speakers' mental representation. The habitual use of classifiers implicitly modulates Chinese speakers' similarity decision-making, leading to longer processing times, but it does not dominate their overall perception of everyday objects.

References

- Grüter, T., Lau, E., Ling, W. 2020. How classifiers facilitate predictive processing in L1 and L2 Chinese: the role of semantic and grammatical cues. *Language, Cognition and Neuroscience*, 35(2), 221–234.
<https://doi.org/10.1080/23273798.2019.1648840>
- Leung, J. H., Williams, J. N. 2014. Crosslinguistic differences in implicit language learning. *Studies in second language acquisition*, 36(4), 733-755.
- Speed, L. J., Chen, J., Huettig, F., Majid, A. 2021. Classifier categories reflect but do not affect conceptual organization. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 47(4), 625-640.
- Tsang, C., Chambers, C. G. 2011. Appearances aren't everything: Shape classifiers and referential processing in Cantonese. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 37(5), 1065.
- Zhang, H. 2007. Numeral classifiers in Mandarin Chinese. *Journal of East Asian Linguistics*, 16(1), 43-59. doi:10.1007/s10831-006-9006-9