Classifier versus taxonomic relations in a similarity judgement task

Jiahuan Zhang

Department of Theoretical and Applied Linguistics, The University of Cambridge, UK
Faculty of Education, The University of Hong Kong, Hong Kong SAR, China

https://doi.org/10.36505/ExLing-2022/13/0052/000594

Abstract

Compared with non-classifier speakers, classifier speakers often showed more sensitivity to classifier-oriented parameters (also referred to as conceptual saliency) such as animacy, shape and function – the purported "classifier effect". This study thus further testified the classifier effect through a similarity judgement task. Chinese speakers (N=41) rated significantly lower than English speakers (N=41) in taxonomic pairs, but not in thematic, classifier or filler pairs. However, both groups consistently rated highest in the thematic pairs, followed by the taxonomic, classifier and filler pairs. Chinese speakers also spent longer time than their English counterparts in each pair condition. A subset analysis of taxonomic pairs indicated a varying degree of disparity on conceptual saliency. Findings together suggested an implicit classifier effect from Chinese speakers, but classifier relation itself was not employed as a predominant parameter for object perception.

Keywords: Chinese classifiers, similarity judgement, conceptual structure, object categorisation, conceptual saliency

Introduction

Classifiers are grammatical category. As a reference-tracking device, Chinese classifiers are unique in their semantic association with the internal property of head nouns, which leads to the discussion of the relationship between language and cognition. Much research adduced evidence to the purported classifier effect from Chinese speakers through a range of conceptual categorisation tasks (e.g., Gao & Malt, 2009; Saalbach & Imai, 2007; Speed et al., 2021). However, classifier types (e.g., shape, animacy, and function) as the representative of conceptual saliency can also affect categorisation decision (e.g., Wang & Zhang, 2014), which have been limitedly considered insofar. This study thus aims to further scrutinise whether the classifier effect is modulated by classifier types.

Methodology

Participants

Participants were 41 native Chinese speakers (female=29, M_{age}=24.16, SD_{age}=2.58) and 41 native English speakers (female=26, M_{age}=22.31, SD_{age}=2.71), all were university students.

Materials

The majority of the targets and items were selected from previous classifier-related similarity judgement tasks (Gao & Malt, 2009; Saalbach & Imai, 2007), with one modification being the counterbalance of classifier types, i.e., shape, animacy, and function across feature conditions. Seventy-two trials were constructed, including 18 quintuplets of objects. Each quintuplet consisted of one target and four objects representing each of the four features to the target. The first feature shares the same Chinese classifier but does not overlap with taxonomic or thematic features (e.g., river-scarf). The second feature is the taxonomically correlated item with the target (e.g., river-sea), and the third one is thematically correlated (e.g., river-water). The last one is the filler pairs. All trials in each version were automatically randomised across the three blocks and all participants by Gorilla.

Procedure

In each trial of the task, participants were shown an image (with its written word in red shown beneath) and a written word of another item simultaneously. A Likert-scale (1 for strongly dissimilar and 7 to strongly similar) was presented on the lower half of the screen along with the test item. Participants were asked to judge the similarity between the two items. To avoid confirmation bias, participants were told that there was no clear definition for "similarity", so that they could not follow any prescribed rules and have to define the concept themselves. Figure 1a and 1b illustrated an example for the English and Chinese version, respectively. Reaction times (RTs) on each trial were automatically recorded. Participants were encouraged to respond as quickly and as accurately as possible, without time limit imposed.

Figure 1a. English example.

Figure 1b. Chinese example.

Results

The analysis of responses & RTs

A mixed-effects OLR model was fit to the data, formula: response ~ L1*feature+(1|participant)+(1|item), Hess=TRUE. Figure 2a demonstrates the results. There was a significant interaction between L1 and feature. The drop from taxonomic to classifier pairs was less by 1.022 ($p < 0.001$) with Chinese group in comparison to the English one. Referring to Chinese group as the base level, the estimated β for English group was significantly positive at 1.266 ($p < 0.001$) in taxonomic pairs. Chinese and English groups gave comparable ratings for other feature conditions.

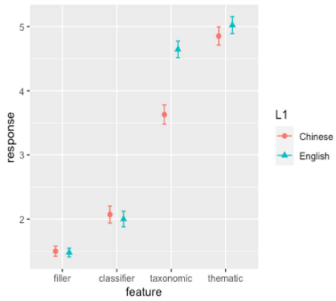

Figure 2a. Responses across L1 and features.

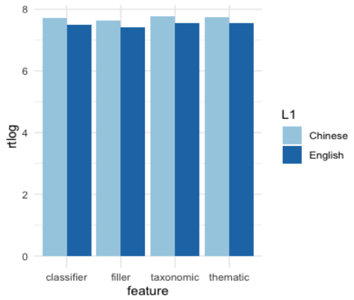

Figure 2b. RTs (ms) across L1 and feature.

RTs were log transformed to ensure normality. A linear mixed-effects model was fitted, formula: lmer(rtlog ~ L1*feature + (1 | participant) + (1 | item). Overall, there was no interaction (Figure 2b). Chinese group needed significantly longer time than the English group on each critical feature condition: classifier (β = 0.204, $p < 0.05$); taxonomic (β = 0.194, $p < 0.05$) and thematic (β = 0.191, $p < 0.05$).

Subset analysis – the analysis of taxonomic pairs

There was a significant interaction between L1 and type (β = -0.830, $p < 0.05$). Pairwise comparisons showed that the English group rated significantly higher in each type than the Chinese group, and the significance levels are: animacy (β = 2.254, $p < 0.001$), followed by function (β = 1.424, $p < 0.01$), and shape (β = 1.251, $p < 0.05$), respectively.

Discussion and conclusions

In contrast with many previous studies (e.g., Schmitt & Zhang, 1998), the present study did not obtain the classifier effect. One possibility could be the research design. This study deliberately paired classifier items across the taxonomically superordinate boundary (cf. Saalbach & Imai, 2012), such as *river-scarf* for classifier *tiao2*, to avoid potential bias on taxonomic categorisation. Another explanation is that incorporating taxonomic and thematic pairs probably skewed the judgements towards apparent semantic relation, which is different from when classifier pairs were only pitted against with fillers (see Schmitt & Zhang, 1998). Still, what can be rest assured is that the classifier-related feature was noticeable to English speakers although not exposed to

Chinese before (see also Saalbach & Imai, 2012; Speed et al., 2021). These together support that classifier relation is reflective of universal conceptual structure, not linguistically restricted (Speed et al., 2021).

Intriguingly, Chinese speakers rated significantly lower in taxonomic pairs compared with English speakers. My interpretation is that the habitual use of classifiers may have underlyingly formulated a more fine-grained scale for taxonomic categorisation, in line with the hypothesis in Wang and Zhang (2004). The longer RTs may also account that the Chinese speakers showed more sensitivity to processing object categorisation because of the use of classifiers.

The group differences in taxonomic pairs potentially offered us a unique window to discuss the classifier type effect underpinning by conceptual saliency. The more salient features, reversely, attracted a lower rating because of a higher level of corresponding sensitivity. The varying magnitude of significances showed convergence with Chinese classifier acquisition studies (e.g., Zhang, Gnevsheva 2022) and cognitive research (e.g., Gao, Malt 2009).

Taken together, the above findings suggest that Chinese speakers did not capitalise on classifier categorisation rule in their object conceptual reasoning, at least not in a moment-to-moment fashion (Saalbach, Imai 2007, Speed et al. 2021). Synthesising the discussion, the indirect, elusive classifier effect obtained in this study is concluded as an "implicit classifier effect".

Acknowledgements

I would like to express my very deep gratitude to Professor John Williams for his valuable and constructive suggestions on the conceptualisation of this research work.

References

Gao, M. Y., Malt, B. C. 2009. Mental representation and cognitive consequences of Chinese individual classifiers. Language and Cognitive Processes, 24, 1124-1179.

Saalbach, H., Imai, M. (2007). The scope of linguistic influence: Does a classifier system alter object concepts? Journal of Experimental Psychology: General, 136, 485-501. doi:10.1037/0096- 3445.136.3.485

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.

Wang, R., Zhang, C. 2014. Effect of classifier system on object similarity judgement: A cross-linguistic study. Journal of Chinese Linguistics, 42(1), 188-217.

Zhang, J., Gnevsheva, K. (2022). The effects of L1, task, and classifier type in Chinese-L2 learners' use of classifiers. Chinese as a Second Language Research. https://doi.org/10.1515/caslar-2022-0002

Zhang, S., Schmitt, B. 1998. Language-dependent classification: The mental representation of classifiers in cognition, memory, and ad evaluations. Journal of Experimental Psychology: Applied, 4, 375-385. doi:10.1037/1076-898X.4.4.375.