

Grammatical Illusions in Long-Distance Chinese Classifier Processing: The Roles of Phonology, Orthography, and Semantics

Previous research on agreement attraction has shown that memory retrieval during agreement processing is influenced not only by the grammatically licit antecedent but also by structurally illicit yet feature-matching attractors. These findings have been taken as evidence that sentence processing relies on a parallel, content-addressable retrieval mechanism (McElree, 2003; Lewis & Vasishth, 2005). Much of the agreement-attraction literature has focused on morphosyntactic features—such as number, person, and gender—and results indicate that these cues reliably guide retrieval processes during dependency formation (Wagers et al., 2009). A separate body of work has demonstrated that phonological and orthographic information also plays a critical role in language processing (e.g., Perfetti & Zhang, 1995; Chen & Shu, 2001). However, whether such non-morphosyntactic cues are also utilized during memory retrieval, in a manner comparable to morphosyntactic cues, remains largely unexplored (cf. Paspali & Marinis, 2020). In the present study, we address this question in Chinese, whose writing system provides a unique opportunity to investigate the contribution of non-morphosyntactic cues to memory-guided dependency resolution. To this end, we conducted a self-paced reading time experiment examining the processing of classifier–noun agreement in Chinese.

We employed a construction in which a noun (电影 ‘movie’) precedes its agreeing classifier (部), forming a long-distance dependency (1). We then created four types of violation conditions by changing the second character of the preceding noun while controlling for the frequency and visual complexity of the substituted second characters (70 sentence sets; 140 fillers). We used an orthographically similar character (Orthographic condition; (2)), a character sharing the same pronunciation as the correct second character (Homophonic condition; (3)), a semantically related character (Semantic condition; (4)), and an unrelated character (Unrelated condition; (5)), in addition to the grammatical condition in (1). All resulting two-character strings were non-words, with the exception of the grammatical condition. A norming study verified that the violation conditions were created as intended (all p s < .001). Fifty-six native speakers of Chinese participated in the self-paced reading experiment.

Results. Ungrammaticality effects were observed at the classifier position only for the Orthographic and Unrelated conditions, which elicited longer reading times than the Grammatical condition (p s < .05). In contrast, the Homophonic and Semantic conditions did not differ from the Grammatical condition at this position (Fig. 1). At the subsequent spillover region, only the Unrelated condition produced longer reading times than the Grammatical condition (p < .02), while the other violation conditions did not differ from baseline (Fig. 2). These results suggest facilitatory intrusion effects of a distractor, emerging early in the Homophonic and Semantic conditions but later in the Orthographic condition.

These findings suggest that memory retrieval processes may draw on phonological, orthographic, and semantic cues, indicating that non-morphosyntactic information contributes to memory-guided dependency resolution. The results further suggest that orthographic cues may play a comparatively weaker role than phonological and semantic cues.

(1) 电影 集体 上映 票房 最高 的 这 部 是 国产 的
 movie all release Box office highest DE this classifier is domestic DE
 'The film, among those released at the same time, had the highest box office and is domestically produced'

(2) Orthographic violation: 电形 (3) Homophonic violation: 电颖

(4) Semantically related: 电戏 (5) Unrelated: 电摔

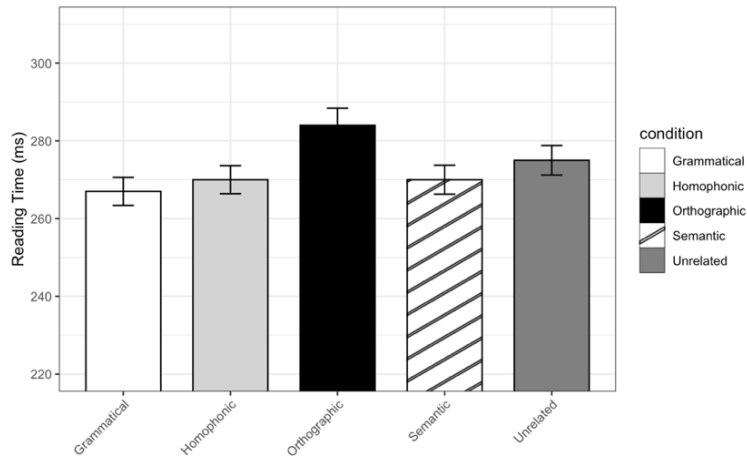


Fig 1 Mean reading times at the classifier position

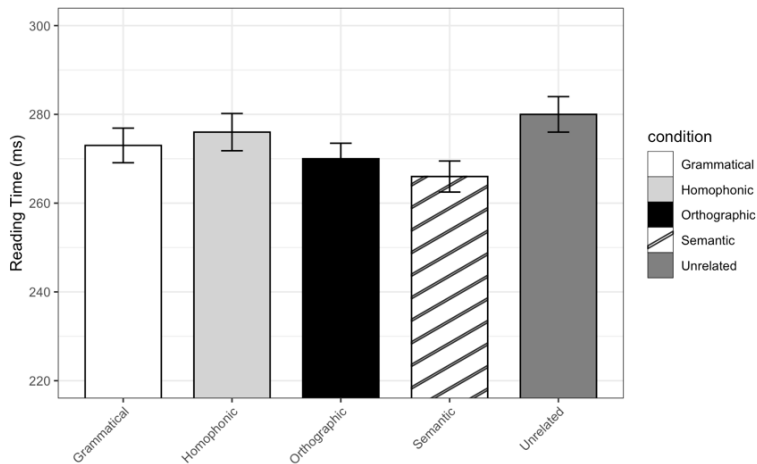


Fig 2 Mean reading times at the immediate spillover region