Effects of semantic similarity on referring expression production in Mandarin Chinese

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Semantic similarity between entities can cause interference in production (similarity-based interference effect (SIE)). Some studies show that semantic similarity leads to *more* explicit referring expressions, e.g., repeated full NPs (Fukumura et al., 2011), whereas other studies show it leads to *less* explicit referring expressions, e.g., omission of NPs (Hsiao et al., 2014). Moreover, the cause of SIE is controversial. Traditionally, the *ambiguity avoidance account* argues that when there is another semantically similar entity, SIE arises due to speakers' communicative effort to avoid using referentially ambiguous expressions such as pronouns and instead favour explicit expressions (Karmiloff-Smith, 1985). However, the *semantic competition account* argues that SIE results from semantic competition between two semantically similar entities, making speakers activate more information about the referent and so produce explicit expressions (Arnold & Griffin 2007). We report three experiments designated to discriminate these accounts of SIE.

We first conducted Exp1 (N=35) investigating the existence of SIE on referential choices in spoken Mandarin, a language of particular interest since it allows for NP omission/null subjects as one referential choice. We manipulated semantic similarity between the target and a same-gender competitor: *high-similarity* (e.g., killer-murderer) vs *low-similarity* (e.g., killer-proofreader). Participants saw introductory pictures and preambles mentioning both entities, then described actions involving only the target. The use of NP omission, pronouns and repeated NPs was measured. We found that participants produced fewer omissions (P<.001) and more repeated NPs (P<.001) in the high-similarity than in the low-similarity condition. This consequence of SIE is compatible with Fukumura et al., (2011), but not with Hsiao et al., (2014).

Exp2 (N=35) investigated the contentious cause of SIE. In gendered languages such as English, speakers tend to avoid using referentially ambiguous pronouns when the discourse includes two same-gender entities (Arnold et al., 2000). Such a gender congruency effect can be explained by both accounts of SIE mentioned above. Spoken Mandarin is particularly interesting because it is non-gendered, thus enabling us to discriminate between the two accounts. In Exp2, we varied the gender of one entity in every target-competitor pair used in Exp1 (*different-gender* condition). By performing a combined analysis with Exp1 (*same-gender* condition), we found a main gender congruency effect for pronouns only, as speakers produced more pronouns in the different-gender than in the same-gender condition (P=.019). This is inconsistent with both the ambiguity avoidance account (which predicts no gender congruency effect here since pronouns are referentially ambiguous in both gender conditions) and the semantic competition account (which predicts more repeated NPs and/or fewer omissions in the same-gender condition). Two post-hoc questionnaires suggested the main effect observed could be attributed to gender-typicality of the entities and varied levels of semantic similarity resulting from gender congruency.

Exp3 (N=35) further tested the accounts of SIE by conducting a written production version of Exp2, as pronouns are gendered in written Mandarin (*referentially-unambiguous* condition). By performing a combined analysis with Exp2 where pronouns are *referentially-ambiguous* in spoken Mandarin, we found a significant interaction between referential ambiguity and semantic similarity for pronouns (P<.001). This indicates that SIE does not result entirely from semantic competition. Rather, it can also be modulated by referential ambiguity, supporting the ambiguity avoidance account.

In summary, we found that Mandarin speakers tend to be more explicit (rather than less explicit) when the discourse includes another semantically similar entity. More importantly, besides semantic competition, SIE is dependent on ambiguity avoidance, suggesting the influence of both speaker-internal and addressee-based production constraints on speakers' referential choices.