Encoding and retrieval interference in dependency resolution

Jens Roeser, Lena Jäger, Lena Benz, & Shravan Vasishth (University of Potsdam)
jroeser@uni-potsdam.de

Introduction: Structurally inaccessible noun phrases (NPs) which are not in a binding relation with the anaphoric element have sometimes been found to be incorrectly bound by the anaphor, leading to a slowdown in processing (Badecker and Straub, 2002; Patil et al., 2014). This so-called inhibitory interference effect occurs when the legal antecedent and the structurally inaccessible NP share features (e.g., gender in English reflexives *himself/herself*). Dillon (2011) attempted to explain this slowdown not in terms inhibition but rather in terms of encoding interference: in configurations where the syntactically licensed antecedent and the structurally inaccessible NP share a feature, a degradation might occur of the memory trace of the legal antecedent due to mechanisms like feature overwriting (Oberauer and Kliegl, 2006), causing increased processing time during retrieval of the legal antecedent. In this experiment, we aim to determine whether interference effects in anaphoric dependency processing can be explained by encoding interference.

Swedish possessive pronouns (*hans* 'his') show gender agreement with the antecedent, while possessive reflexives (*sina* 'his'/'her') do not (see Table 1). If an inaccessible NP matches in gender with the legal antecedent, in the case of gender marked pronouns either encoding or inhibitory interference could explain any slowdown seen at the pronoun; by contrast, in possessive reflexives, any slowdown seen can only be attributed to encoding interference, because the reflexive does not have any gender marking which therefore cannot be a retrieval cue. Thus, if only inhibitory interference explains any slowdowns at the anaphor, an interaction of anaphor type and interference is expected: a slowdown in the gender marked pronoun due to feature match, but no slowdown in the possessive reflexive. If only encoding interference accounts for the slowdown, a main effect of interference is predicted, with no interaction of interference with anaphor type.

Method: 32 Swedish natives read sentences manipulated for anaphor type and interference (Table 1). Eye movements and response accuracy requiring anaphor resolution have been measured.

condition	antecedent	region 2	region 3	region 4	pre-critical	critical	spill-over	wrap-up
pron (match/ mism.)	Åke	säger	att	**Alf**/ **Eva**	jobbade med	**hans**	sysslingar	på helgerna.
	Åke [M]	says	that	Alf [M]/ Eva [F]	worked with	his [M]	siblings	at the weekend
refl (match/ mism.)	Åke	som	**Alf**/ **Ann**	tackade	ringer	**sina**	sysslingar	på kvällen.
	Åke [M]	who	Alf [M]/ Ann [F]	thanked	calls	his [∅]	siblings	in the evening

Table 1: Stimulus sentences with regions of interest.

Results: Question-response accuracy revealed an interaction of interference and anaphor type ($p<0.01$) showing a lower response accuracy due to interference in pronouns ($p<0.0001$) but not in reflexives ($p=0.71$). Re-reading time regressive, the sum of all second-pass fixation durations in the pre-critical region after a region to its right has been fixated, shows an interaction of interference and anaphor type ($t=2.18$) with a slowdown in pronouns ($t=2.16$), but not in reflexives ($t=-0.94$). In the pre-critical region, last pass reading time (the sum of all fixation durations during the last pass) shows an interaction of interference and anaphor type ($t=2.11$) with a slowdown in pronouns ($t=3.01$) but not in reflexives ($t=0.03$).

Conclusion: Interference effects seem to be due to inhibitory processes following incorrect initial retrieval of the structurally inaccessible NP and not due to encoding interference.

References
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