Syntactic and semantic effects on the interpretation of pronouns and reflexives
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Two visual-world eye-tracking experiments investigated the relative weights of syntactic and semantic constraints on pronouns and reflexives to evaluate the form-specific hypothesis that each anaphor has its own set of weighted constraints.

Chomskyan Binding Theory (BT,[2]) is a well-known account of syntactic constraints on English pronouns and reflexives and their (almost) complementary distribution. Picture-NPs (PNPs) are a well-known exception: both forms are possible (ex.1). Semantic factors are claimed to influence anaphor resolution, especially in possessorless PNPs, e.g.[8],[9]. In particular, according to [10], pronouns prefer antecedents that are perceivers-of-information, and according to [5], reflexives prefer source-of-information antecedents. We aimed to: (a) investigate hypothesized source/perceiver preferences experimentally; (b) determine whether source/perceiver information has immediate effects ([3]vs.[6], also [1]); and (c) extend to the intra-sentential domain, the form-specific multiple-constraint approach ([4]), which maintains that anaphor resolution is guided by multiple factors which, crucially, are weighted differently for each anaphoric form.

Exp.1--Participants heard sentences with possessorless PNPs and saw displays with two characters and a picture of each character (ex.2). The task was to click on the mentioned picture. Anaphoric form (pro/ref) and verb-type (heard/told) were crossed, creating four conditions. Results: With pronouns, participants show a perceiver preference, choosing the subject-picture more with heard than told (p<0.01). Reflexives show no clear verb effect; subject-pictures are usually chosen (~90%). With pronouns, eye-movements show a perceiver preference 200ms post-pronoun-onset (p<0.05)--the earliest point for input-driven eye-movements ([7]). With reflexives, eye-movements reveal an early, subtle sensitivity to source: Starting 200ms post-onset, participants look more at the object-picture when it is the source than the perceiver (p<0.05). Thus, pronouns and reflexives are immediately sensitive to semantic information. Reflexives' overall subject-preference indicates the syntactic subject constraint is weighted more heavily than the semantic source constraint; with pronouns the relative weights of the syntactic and semantic constraints (anti-subject constraint and perceiver constraint) are more evenly matched.

Exp.2--We evaluated another syntactic constraint, testing possessed PNPs (PPNPs, ex.3). For PPNP-pronouns, Subj and Obj are BT-compatible antecedents, but the possessor is not--i.e., anti-possessor constraint. However, according to BT, PPNP-reflexives must refer to possessors--i.e., possessor constraint. Results: Pronouns again prefer perceivers, shown by picture-choices (p<0.01) and eye-movements (p<0.05). Lack of possessor choices indicates the syntactic anti-possessor constraint outweighs the semantic perceiver and the syntactic anti-subject constraints. Reflexives strongly prefer possessors, with some subject-picture choices (~8%). Neither picture-choices nor eye-movements show verb effects for reflexives. Thus, the syntactic possessor constraint outweighs the source and subject constraints.

Conclusions--Both semantic and syntactic constraints guide anaphor resolution from earliest moments onwards. For reflexives, the subject constraint is weighted more heavily than the source constraint. Pronouns show more balanced competition between syntactic and semantic constraints. Exp.2 shows syntactic constraints need not pattern as a block: pronouns are subject to a strong anti-possessor constraint and a weaker anti-subject constraint. Overall, pronouns are more susceptible to verb information than reflexives. In intra-sentential domains, like cross-sentential reference resolution [4], anaphoric forms differ in sensitivity to different kinds of information, as predicted by the form-specific approach.

(1) Possessorless PNP: Lisa likes the picture of herself/her.
(2a) Exp.1 Scene = Peter, Andrew, picture of Peter, picture of Andrew
(2b) Peter (told / heard from) Andrew about the picture of (him/himself) on the wall.
(3) Exp.2 Peter (told/heard from) Andrew about Greg's picture of (him/himself) on the wall.