

## Pronoun resolution, *i*-within-*i* effects and antecedent-contained deletion

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**The old riddle** The classical challenge raised by the *i*-within-*i* effects is that of understanding why sentences like (1) cannot be used to express the thought indicated below them. That is, why can't we interpret the pronouns in (1) as covarying or corefering with their suggested DP antecedent?

- (1) a. \*The policemen investigated [<sub>DP</sub> every wife of [[her]<sub>*i*</sub> childhood sweetheart]]<sub>*i*</sub>  
*Intended: The policemen investigated every woman who married her own childhood sweetheart*  
b. \*The policemen investigated [<sub>DP</sub> the wife of [[her]<sub>*i*</sub> childhood sweetheart]]<sub>*i*</sub>  
*Intended: The policemen investigated the woman who married her own childhood sweetheart*

Explanatory accounts of these effects have converged towards the idea that the different pronoun resolution strategies that could deliver the suggested readings in (1) are either unavailable or lead to further issues. First, resolution via semantic binding is unavailable: relational constructions like *every wife of DP* lack a syntactic subject slot and thus cannot bind within their DP-complement (a.o., Chomsky 1981, 1993, Jacobson 1994, Marty 2017). Second, resolution via replacement (NP ellipsis or the like) gives rise to a problem of infinite regress since the offending pronouns are contained by their antecedents (a.o., Jacobson 1979, 1994, Higginbotham 1983, Brody 1982, Haik 1984). Third, resolution via mere coreference, available for (1b), leads to pragmatically deviant representations on which reference to the same individual is achieved via distinct but presupposedly coreferential descriptions (a.o., Postal 1970, Williams 1982, Heim 1982, Aloni 2001, Marty 2017). Taken together, these ingredients offer a satisfying account of the *i*-within-*i* effects.

**The new riddle** We add to this background the novel observation that pronoun resolution is in fact possible in certain *i*-within-*i* environments. The key piece of evidence comes from an unexplored type of *i*-within-*i* construction, exemplified in (2), in which the relevant pronoun is contained in a relative clause modifying a DP embedded in the DP antecedent and yet its interpretation can covary with that of its antecedent DP. Crucially, we note that, in these environments, the relevant pronoun cannot be semantically bound by its antecedent DP (for the same reason as before), that it is properly contained by its antecedent at surface form (just as before), and that construing it as a referring pronoun cannot derive its observed interpretation.

- (2) The policemen investigated [<sub>DP</sub> the boss of [every employee [that complained about [him]<sub>*i*</sub>]]]<sub>*i*</sub>  
*Intended: for every employee that complained about his boss, the policemen investigated the boss of that employee.*

At first blush, this observation may suggest an E-type analysis of *him* along the lines of Cooper (1979): the relation *boss of* is made salient by (2) and this salient relation is perhaps all we need to produce the intended reading of *him* in that example. We observe however that the possibility to resolve pronoun reference in these constructions depends in fact on the nature of the intermediate DP container: as exemplified in (3), if a definite DP is used in place of a genuinely quantificational one, then the *i*-within-*i* effects reappear, suggesting that the presence of a definite DP blocks the interpretive processes at play in (2).

- (3) \*The policemen investigated [<sub>DP</sub> the boss of [the employee [that complained about [him]<sub>*i*</sub>]]]<sub>*i*</sub>  
*Intended: The policemen investigated the man who hired somebody who complained about him*

The new riddle is thus twofold: What kind of processes permit speakers to overcome the *i*-within-*i* effects in cases like (2)? And why are those processes unavailable in minimally different cases like (3)?

**Part 1: Antecedent-contained NP-deletion** We propose that the interpretation of sentences like (2) falls out from an interaction between the mechanisms proposed for pronoun resolution and those proposed for ACD repair. Specifically, our proposal relies on three assumptions. First, the pronouns in these constructions are interpreted as D-type pronouns involving NP-ellipsis (a.o., Postal 1966, Evans 1980, Elbourne 2001, 2005): abstracting from  $\phi$ -features, the pronoun *him* in (2) can be analyzed as a definite determiner whose NP-complement has undergone deletion at PF, (4a). Second, in order to resolve a type mismatch, the intermediate DP container headed by *every* undergoes Quantifier Raising (QR) and this movement operation brings about ACD resolution, e.g. (4b). Finally, NP-ellipsis is resolved by recovering the content of the

elided NP ( $NP_e$ ) from its antecedent NP ( $NP_a$ ) and by re-binding the variable within it, (4c). The LF we obtain delivers for (2) the interpretation we observed: *for every employee  $x$  such that  $x$  complained about the boss of  $x$ , the policemen investigated the boss of  $x$ .*

- (4) a. BASED-GENERATED: the policemen investigated [<sub>DP</sub> the [ <sub>$NP_a$</sub>  boss of [<sub>DP</sub> every [<sub>NP</sub> employee [<sub>CP</sub> PRO  $\lambda_1$  that  $t_1$  complained about [<sub>DP</sub> the [ <sub>$NP_e$</sub>   $\Delta$ ]]]]]]]]]  
 b. QR AND ACD RESOLUTION: [<sub>DP</sub> every [<sub>NP</sub> employee [<sub>CP</sub> PRO  $\lambda_1$  that  $t_1$  complained about [<sub>DP</sub> the [ <sub>$NP_e$</sub>   $\Delta$ ]]]]]  $\lambda_2$  [the policemen investigated [<sub>DP</sub> the [ <sub>$NP_a$</sub>  boss of  $t_2$ ]]]  
 c. NP-ELLIPSIS RESOLUTION AND REBINDING: [<sub>DP</sub> every [<sub>NP</sub> employee [<sub>CP</sub> PRO  $\lambda_1$  that  $t_1$  complained about [<sub>DP</sub> the [ <sub>$NP_e$</sub>  boss of  $t_1$ ]]]]]]]  $\lambda_2$  [the policemen investigated [<sub>DP</sub> the [ <sub>$NP_a$</sub>  boss of  $t_2$ ]]]

The core assumptions underlying this analysis find independent motivations. First, these examples are instances of inverse-linking configurations, which have been argued to involve QR (a.o., [May 1985](#), [Büring 2005](#), [Sauerland 2005](#)). Second, the fact that QR can bring about ACD resolution in inverse-linking configurations is supported by the grammaticality and interpretation of comparable DP-contained ACD structures involving VP-ellipsis: (5) is grammatical, and it is so only on the inverse-scope interpretation of *a* and *every* ([Kennedy 1997](#)). Third, the possibility to re-bind variables with NP-ellipsis has been shown to account for the interpretability of crossing coreference sentences like (6) (a.o., [Jacobson 1979](#), [Marty 2017](#); for re-binding with VP-ellipsis, see [Takahashi and Fox 2005](#)). We argue then that the sentence in (2) offers a case where both these processes coexist and are jointly needed to obtain an interpretable LF-structure.

- (5) The policemen [ <sub>$VP_a$</sub>  read [<sub>DP</sub> a report on [<sub>DP</sub> every suspect Sherlock did [ <sub>$VP_e$</sub>   $\Delta$ ]]]]  
 (6) [Every student who deserves it <sub>$i$</sub> ] <sub>$j$</sub>  will get [the reward he <sub>$j$</sub>  wants] <sub>$i$</sub>   
 LF: [every std [PRO  $\lambda_1$  who  $t_1$  deserves [the [ <sub>$NP_e$</sub>   $\Delta$ ]]]  $\lambda_2$   $t_2$  will get [the [ <sub>$NP_a$</sub>  reward he <sub>$2$</sub>  wants]]]

**Part 2: QR and ACD in inverse-linking configurations** We propose that the contrast between (2) and (3) witnesses the fact that the QR operation necessary to resolve ACD in (2) is blocked in (3). As we discuss, this blocking effect is to be understood as a reflex of the licensing conditions on QR in the way discussed in [Fox \(2000\)](#) (see also [Reinhart 1998, 2006](#), [Bruening 2001](#), [Takahashi 2006](#)): constraints against scopally commutative QR prevent a scope-shifting operation (SSO) from being licensed in (3) since the target DPs would not generate a new scopal relation in an inverse configuration. As a result, the target pronoun in (3) remains antecedent-contained and fails to be resolved. In support of our proposal, we show that similar contrasts between scopally commutative and non-commutative DPs reproduce in DP-contained ACD structures involving VP ellipsis: the contrast between (5) and (7) is expected if, as we argue, the QR operation resolving ACD in (5) is unlicensed in (7) given constraints against semantically vacuous SSOs.

- (7) \*The policemen [ <sub>$VP_a$</sub>  read [<sub>DP</sub> a report on [<sub>DP</sub> the suspect Sherlock did [ <sub>$VP_e$</sub>   $\Delta$ ]]]] (cf. (5))

Finally, we note that our proposal remains fully compatible with the idea that QR is available to all DPs in standard ACD cases like (8) (a.o., [May 1985](#), [Fiengo and May 1994](#), [Harley 2002](#)), where no contrast between definite and universal DPs is found: since QR to the edge of *vP*/*VP* is sufficient for resolving ACD, as argued in [Merchant \(2001\)](#), the above restrictions on QR are harmless in those environments.

- (8) The policemen [ <sub>$VP_a$</sub>  investigated [<sub>DP</sub> every/the suspect Sherlock did [ <sub>$VP_e$</sub>   $\Delta$ ]]]

**Synthesis** This study reflects on what the mechanisms for ACD repair teach us about pronoun resolution and, conversely, on what the constraints on pronoun resolution teach us about ACD. The novel phenomenon we present, *Antecedent-Contained NP Ellipsis*, adds to the body of evidence that a QR-like operation must be licensed in order to resolve ACD, while providing another case where an approach to pronoun resolution based on NP-ellipsis appears to be warranted.

**Selected references:** Elbourne, P., 2005, *Situations and individuals*  $\diamond$  Fox, 2000, *Economy and semantic interpretation*  $\diamond$  Jacobson, P., 1994, *i-within-i effects in a variable free semantics and a categorial syntax*  $\diamond$  Kennedy, C., 1997, *Antecedent-contained deletion and the syntax of quantification*  $\diamond$  Marty, 2017, *Implicatures in the DP domain*  $\diamond$  Takahashi & Fox, 2005, *MaxElide and the re-binding problem*.