Syntactic variables and crossover

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In this paper, we argue that when two syntactic variables are "related" (to be explained below) and stand in a c-command relationship at LF, the following ¾-pattern emerges:

(1) free ... free   bound ... bound   bound ... free   *free ... bound

We show that several otherwise-disparate puzzles are subsumed under the ¾-pattern: Dahl's Puzzle, strong crossover effects, the Nested DP Constraint, exceptional *de dicto*, *de re* blocking, and certain restrictions on fake indexicals. For reasons of space, only some are discussed here.

Proposal: We propose that these phenomena are uniformly derived in terms of a crossover constraint. Our analysis has three ingredients: (i) Drummond's (2014) formulation of SCO, which prohibits λ-operators from binding a variable across an element overlapping in value:

(2) *Strong Crossover* [Drummond 2014:16]
$*[_{\gamma}\ \lambda_i\ \ldots\ A_k\ \ldots\ B_i\ ]$ (where γ immediately dominates λ_i) if (a) λ_i c-commands A_k c-commands B_i, (b) A_k and B_i overlap in value, and (c) A_k is not bound within γ.

(3) A and B overlap in value iff neither A-binds the other and for all assignments, given the values x of A and y of B, there is a z such that $z \leq x$ and $z \leq y$. [Drummond 2014:15]

(ii) The Anchor Semantics of modality, where modal domains are projected from pieces of the actual world (i.e. modal anchors) (Kratzer 2006, 2009, 2013, 2020; Arregui 2009):

(4) For any part of a (maximal) situation s, $f_{act}(s)$ is the set of possible (maximal) situations that have an *exact match*—the most stringent counterpart relation—of s. [Kratzer 2020]

(iii) The situation pronoun in DP is an argument of D (Schwarz 2012) (NB: There are several syntactic options compatible with our proposal; we use this here for space):

(5) $[_{\text{DP}}\ s\ [\ \text{D NP}\ ]\ ]$

Two crucial consequences to note: First, given (4), if s is the actual world and s' is a member of a modal base projected from a subpart of s, then s and s' always overlap. While the actual world may or may not be included in the modal base, members of the modal base will be at least similar to the actual world in having a subpart that is a counterpart of the anchor situation. (We reformulate (3) in terms of counterparts, omitted here for space.) Second, given (5), a DP's situation pronoun always c-commands all other situation pronouns embedded within that DP.

Dahl's Puzzle (from Drummond 2014): When two pronouns in an elided VP stand in a c-command relationship, if the lower pronoun is sloppy, the higher pronoun must be sloppy too (Dahl 1973, 1974). Thus, of the four possible interpretations, (only) strict/sloppy is unavailable:

(6) Mary $[_{\text{ANTECEDENT}}$ knows that she hates her boss], and Sue does Δ_{VP} too.

a. Δ_{VP} = knows that **Mary** hates **Mary's** boss — strict ... strict
b. Δ_{VP} = knows that **Sue** hates **Sue's** boss — sloppy ... sloppy
c. Δ_{VP} = knows that **Sue** hates **Mary's** boss — sloppy ... strict
d. *Δ_{VP} = knows that **Mary** hates **Sue's** boss — strict ... sloppy

The pattern in (6) is standardly taken to reveal the possible LFs of the antecedent (Fox 2000). The unavailable strict/sloppy reading corresponds to the LF in (7b); this LF is disallowed because *she* and *her* overlap, but *she* is free and thus not bound within the structure in which *her* is bound, violating (2). In sloppy/strict, the binding of *she* does not cross *her* (7a), so (2) is inoperative.

(7) a. Mary $[_{VP}\ \lambda_1\ [\ t_1$ knows that **she**$_1$ [hates **her**$_{=\text{Mary}}$ boss]]] (=6c)

b. *Mary $[_{VP}\ \lambda_1\ [\ t_1$ knows that **she**$_{=\text{Mary}}$ [hates **her**$_1$ boss]]] (=6d)

Nested DP Constraint: Romoli & Sudo (2009) observe that when a DP is nested within another DP in the complement of an attitude predicate, the embedd*ing* DP must be opaque if the embedd*ed* DP is opaque—a restriction they dub the Nested DP Constraint. Therefore, only three of the four possible interpretations are available. While both uniform readings—i.e. transparent/transparent and opaque/opaque—are of course available, only *one* of the two mixed readings is available, namely opaque/transparent. Crucially, the transparent/opaque reading is blocked. This contrast between the mixed readings is shown with the contexts in (8).

(8) Fritz thinks that [the husband of [the chancellor]] is good looking.

a. Fritz is watching TV and sees Angela Merkel, the actual German chancellor, and her brother besides her. He doesn't know who Merkel is, and he thinks that the man besides her must be her husband. (*the husband* = opaque; *the chancellor* = transparent)

b. #Fritz is watching TV and sees Nicola Sturgeon and her husband. He wrongly believes that Nicola is the German chancellor, and furthermore, that the man next to her is her brother. (*the husband* = transparent; *the chancellor* = opaque)

On our analysis, transparent/opaque readings are disallowed because the crossover constraint in (2) is violated: the embedded DP's situation variable s_1 is bound across the embedding DP's situation variable s_0; s_1 and s_0 overlap; and s_0 is *not* bound within the structure in which s_1 is bound (i.e. γ'). On the licit opaque/transparent reading, the embedded DP's situation variable s_0 is bound across the embedding DP's situation variable s_1, and the two variables overlap; however, s_1 *is* bound within the structure in which s_0 is bound (i.e. γ), and thus (2) is obeyed.

(9) * $[_\gamma\ \lambda_0^{transparent} \ldots$ att-pred $[_{\gamma'}\ \boldsymbol{\lambda_1^{opaque}} \ldots [_{DP}\ s_0 \ldots [_{DP}\ \boldsymbol{s_1} \ldots]\,] \ldots]\ ]$ (=8b)

(10) $[_\gamma\ \lambda_0^{transparent} \ldots$ att-pred $[_{\gamma'}\ \boldsymbol{\lambda_1^{opaque}} \ldots [_{DP}\ \boldsymbol{s_1} \ldots [_{DP}\ s_0 \ldots]\,] \ldots]\ ]$ (=8a)

***De re* blocking:** Sharvit (2009, 2011) observes that a reflexive pronoun c-commanded by a *de re* pronoun cannot be interpreted *de se* (see also Charlow 2010):

(11) McCain convinced Palin that she (had) voted for herself. [Sharvit 2011:71]

a. Palin's conclusion : "**This woman** voted for **herself**". *de re ... de re*

b. Palin's conclusion: "**I** voted for **myself** ". *de se ... de se*

c. Palin's conclusion: "**I** voted for **this woman**". *de se ... de re*

d. *Palin's conclusion : "**This woman** voted for **me**". *de re ... de se*

On our analysis, *de re* blocking follows from the fact that *de se* interpretations require binding and that both relevant LFs violate the constraint in (2): *herself* and *she* overlap, *herself* is bound across *she*, and *she* is not bound within the structure that *herself* is bound (i.e. γ):

(12) a. *$[_\gamma\ \lambda_5^{de\text{-}se}\ [_{LD}$ **she**$_{=\text{Palin}}$ voted for **herself**$_5$]]

b. *$[_{\gamma'}\ \lambda_6$ [... $[_\gamma\ \lambda_5^{de\text{-}se}\ [_{LD}$ **she**$_6$ voted for **herself**$_5$]]]]

Discussion: The ¾-pattern in (1) and our unified crossover analysis extend to other puzzles, omitted here for space: SCO effects with movement, exceptional *de dicto* (Wolter 2006, 2007), *de re*-blocking with dream reports (Percus & Sauerland 2003), and certain restrictions on fake indexicals (Kratzer 2009). The picture to emerge is one in which the grammar utilizes individual and situation variables, both of which are subject to the same binding-theoretic constraints.

Moreover, the unified analysis does not resort to potentially problematic tools that have been used for some of these puzzles individually, e.g. transderivationality (Fox 2000; Reinhart 2006), complicating Condition A (Sharvit 2011), or elaborate scope-taking mechanisms (Elliott 2023).
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