

Sloppy Non-Pronominals, Focus, and the representation of Variable Binding*

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Overview

- Today's talk: A proposal that solves two problems for standard theories of how variable-binding is derived and represented in grammar
 - First puzzle: **ϕ -features on bound-variable ('sloppy') pronouns** in focus constructions: are they interpreted? (see, a.o., Partee 1989; Kratzer 1998, 2009; von Stechow 2003; Heim 2008; Sudo 2012; Bassi and Longenbaugh 2018; Bassi 2019; Bruening 2019; Ke 2019).
 - Second puzzle: **Bound-variable (sloppy) readings of non-pronominals** in focus constructions:
- (1) *Context: a friends reunion after 20 years* (based on Roeper 2006)
- a. Only Mary still looks like **Mary** (*the rest don't look like **they** used to 20 years ago*).
- The goal: propose a mechanism for sloppy non-pronominals and an account of their limited distribution.

Main claims:

- In focus environments, any expression can trigger Focus-Alternatives, even if it isn't (prosodically) focused; this allows for a special kind of variable-binding structures ('focus binding'; following Kratzer 1991).
 - There is a certain economy principle which favors realizing focus-bound material as pronouns (proforms, more generally) whenever possible.
- Structure of the talk:
 - Section 1 gives background assumptions about binding and focus.
 - Section 2 presents the puzzles in some detail.
 - Sections 3-4 presents my account of the puzzles.
 - Section 5 concludes.

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1 Background

- Empirical domain: **sloppy-identity reading** of sentences in contrastive focus environments.
- (2) Only Mary saw her parents.
- ↪ *sloppy-identity reading*: No one other than Mary saw their own parents.
 - ↪ *strict-identity reading*: No one other than Mary saw x 's parents. (for some salient x)
- Similar ambiguities appear in VP-ellipsis contexts (Ross 1967), but will not be discussed today.
- (3) Mary saw her parents, and Ana did Δ too.
- ↪ *sloppy-identity reading*: Mary saw Mary's parents, Ana saw Ana's parents.
 - ↪ *strict-identity reading*: Mary saw x 's parents, Ana saw x 's parents. (for some salient x)
- The facts I discuss apply to all focus-sensitive operators (*only, even, too,...*), but will only be illustrated with *only*.
 - I take *only* to be a propositional operator (attaches at a clausal level at Logical Form)
 - In (2) it associates with focus on the subject¹
 - Theories that derive the strict-sloppy ambiguity compositionally usually make use of the notions of free and bound variables.
 - On a prominent view (based on Heim and Kratzer 1998):
 - pronouns enter the syntax as (indexed) variables,²
 - Variables are atoms of the syntactic computation (terminal nodes)
 - Their value can either be fixed by the context of utterance, giving us a strict reading;
 - or be bound by a sentence-internal quantifier or λ -operator, giving us the sloppy reading
- (4) a. Sloppy Logical Form: Only [Mary_F λ_i t_i saw her_i parents]
b. Strict Logical Form: Only [Mary_F saw her_i parents]
- The λ -operator assigns the pronoun different values 'at the same time'.
 - In our case it assigns one value per individual that is considered an alternative to Mary.
- (5) $[[\lambda_i \mathbf{S}]] = \lambda x. [[\mathbf{S}]]^{[i \rightarrow x]}$

¹*only* in (2) might also be conceived as attaching just to the subject. It is crucial for my analysis later, however, that this *only* takes scope over the VP, because it would have to have access to the alternatives generated by focus inside the VP. This is apparently empirically correct. The generalization is that subject-level *only* can associate with focus in the VP *as long as* it also associates with focus in the subject. (i) is from Jacobson 2012 illustrating this point.

(i) Scenario: I ask you whether anyone will help bring anything to the dinner; usually no one helps. You answer:
I hate to tell you, but only SUE will bring SALAD. (Jacobson 2012:ex.47)
↪ No one else will bring anything else

²There are also variable-free theories (Jacobson 1999), but the puzzles to be discussed affect them as well, albeit differently.

2 Two sloppy-identity puzzles

2.1 ϕ -features on sloppy pronouns

- Are ϕ -features on sloppy pronouns semantically interpreted? (Partee 1989; Kratzer 1998, 2009; von Stechow 2003; Cable 2005; Heim 2008; Spathas 2010; Sudo 2012; Jacobson 2012; Sauerland 2013; Bassi and Longenbaugh 2018; Bassi 2019; Bruening 2019; Ke 2019)
- Assume that ϕ -features on *strict(/free)* pronouns impose presuppositional restrictions on the possible values of the variable they attach to:

- (6) LF of her_i: x: female(x)
- $$\begin{array}{c} \diagup \quad \diagdown \\ \text{FEM(-SG)} \quad \mathbf{i} \end{array}$$

- If (6) is also the logical form for a sloppy(/bound) pronoun as in (2a), we make the wrong prediction: all the alternatives to ‘Mary’ must be (identifying as) females
 - This predicts, wrongly, that (2) cannot entail that John didn’t see his parents
- Similarly (even worse) for person:

- (7) Only I saw my parents (✓ sloppy)

- On the same assumptions, no way to generate any sloppy interpretation (because no alternative to “I” is the speaker).

- (8) a. Only [_{I_F} λ_i t_i saw my_i parents]
- b. LF of my_i: x: speaker(x)



- Conclusion: simple syntax-semantics for binding yields an undergeneration problem.³

- (9) **Generalization:** A sloppy (bound-variable) pronoun in focus contexts agrees with its focused antecedent in ϕ -features, but those features don’t semantically restrict the possible values of the relevant variable (i.e. they don’t restrict the set of alternatives for the pronoun’s binder)

- Two (among several) approaches to deriving (9):

- **Morpho-syntactic Agreement approach** (Kratzer 1998, von Stechow 2003, Schlenker 2003, Heim 2008, Kratzer 2009, Wurmbrand 2017, a.o.), ϕ -features on bound pronouns are not interpreted; at LF the pronoun consists of a bare, featureless index (a ‘minimal pronoun’).

³The problem is independent of how exactly we treat *only* specifically, and affects all focus-sensitive operators. In fact an (overt) operator is not necessary to generate the problem; simple question-answer pairs are also affected:

- (i) -Who saw their parents?
 -I_F saw my parents

On Rooth’s (1992b) theory of Question-Answer Congruence, the question denotation (set of possible answers) needs to be a subset of the focus semantic value of the answer. If the person features are interpreted on *my* in (i) as we sketched, there is no way to satisfy this requirement. This is arguably the same problem, and is amenable to the same solution I’ll propose later.

- The ϕ -features surface the way they do as a result of morpho-syntactic agreement relationship with their antecedent

- **Problem:** non-local agreement?

(10) Only *I* bought a gift for the person who hosted **me** for thanksgiving (✓ sloppy *me*)

- No C-command (not even LF C-command); McKillen (2016); Bassi and Longenbaugh (2018)

(11) Only if *SUE* has trouble in school I would help **her** (✓ sloppy; based on Tomioka 1999:238)

- The **second approach** (Jacobson 2012; Sauerland 2013; Bassi and Longenbaugh 2018; Bruening 2019) denies that ϕ -features are not interpreted

- The idea: ϕ -features are interpreted, but not at the level of focus alternatives.

(12) “The presuppositions of F-marked NPs (including ϕ -feature presuppositions–I.B.) or NPs whose denotations are identical to them can be absent in focus alternatives.”
(Bruening 2019)⁴

- Avoids assuming unconstrained agreement operation.

- * ...But arguably, no less stipulative.

Puzzle 1:

- If ϕ -features on sloppy (focus-bound) pronouns are not interpreted in focus alternatives, but are interpreted at the level of the ordinary meaning (cf. (12)), why is that?

2.2 Sloppy non-pronominals

- **Sloppy readings of non-pronominals**⁵ have been thought not to exist since at least Geach 1962:

(13) a. Only Satan pities Satan (✓ strict; ✗ sloppy)⁶
b. Only Satan pities himself (✓ sloppy)

- This is not just a peculiarity of ‘competition’ with *reflexives*:

(14) a. Only MARY calls Mary’s parents (✓ strict; ✗ sloppy)
b. Only MARY calls her parents (✓ sloppy)

- However, Roeper (2006) discovered that this, as an absolute generalization, is false:

- In (15) are some of Roeper’s examples for which the judgments are consistent as far as I could confirm (some of the examples are slightly changed from the original):

⁴Bruening 2019 is concerned not just with the presuppositions of ϕ -features.

⁵The term ‘sloppy non-pronominals’ is used in Rooth 1992a.

⁶(13a) is perhaps slightly awkward since it involves a repetition of names, something which is usually independently dispreferred (Geurts 1997; Elbourne 2005). But it is certainly acceptable; crucially, only on a strict-identity reading.

- (15) *Examples based on Roeper 2006 where a non-pronominal has a sloppy reading*
- Only Mary still looks like **Mary** (*the rest don't look like **they** used to 20 years ago*).
 - In a foreign culture, only Mary can act like **Mary** (*the rest can't be **themselves***).
 - In front of British royalty, only Fred still talks like **Fred** (*others put on a phony accent*).
 - Only a very odd person still looks like **a very odd person** after using modern make-up techniques (*ordinary people don't look ordinary*). (sloppy indefinite)
 - In these old pictures, only the living room still looks like **the living room**. (sloppy definite)

- To this list from Roeper I'm adding (16):

(16) (when we had dinner with the new neighbours,) Only Mary was being Mary

- Replacing the object nominal with a reflexive pronoun is, according to speakers, acceptable with the same interpretation:

(17) Only Mary still looks like herself

- Roeper's discovery raises two theoretical challenges:
 - Challenge 1: **How to generate sloppy non-pronominals reading to begin with?** Textbook analyses of binding ban them.^{7,8}
 - Challenge 2: Why are sloppy non-pronominals nevertheless so restricted? **What makes Roeper's cases special?**
- Regarding challenge 2, some (for-now informal) observations that seem relevant:
- First, the predicate in (15) is a **predicate of comparison** (Moltmann 1997): *looks like, acts like* etc.
 - (16) might also be classified as comparison structure (behavior in one situation compared to the usual behavior.)
- Second, when *only* and focus are removed from these sentences, they sound completely acceptable with no feel of condition C violation, whereas normal non-Roeper examples sounds plainly unacceptable (**Satan pities Satan*). This fact is likely closely related to the next fact:
- Third, what I believe is a crucial factor: the subject and object are structurally identical, but they **don't exactly refer to the same thing**.
 - They refer to different '**manifestations**' ('**slices**') of the same individual.
 - 'Manifestations' of an individual are different facets or aspects of that individual in different situations, positions, times etc.
 - This concept captures the intuition that noun phrases sometimes do not describe the whole individual but rather parts of aspects of it (Carlson 1977; Landman 1989; Geist 2019, a.o.).

⁷Roeper (2006) himself seems to envision a focus-movement account where the sloppy non-pronominal and its antecedent move together to *only*. I was not able to understand his sketch of analysis.

⁸Proper names and definite descriptions can sometimes have a bound-variable reading in non-focus contexts, e.g. in (i) below. But those cases are different from our sloppy non-pronominals. (i) submits itself to an analysis that makes use of the usual binding mechanism (possibly binding of situation variables), Roeper's cases not.

(i) If a child is christened 'Bambi', then Disney will sue Bambi's parents.

(Geurts 1997)

- All the sentences in (15) make a claim about different manifestations (in time, situations, etc.) of the same individual/object (independently of focus and sloppiness).
 - (15)a says that Mary as she is in the utterance time looks the same as Mary as she was 20 years ago.⁹
 - (15)b says that Mary in a certain situation doesn't behave like Mary in another situation; and so on.
- In contrast, in (13a) there is no sense in which the two occurrences of 'Satan' refer to two different manifestations—at least not without heavy contextual clues and maybe not even with them.¹⁰

(18) **Generalization:** A non-pronominal N can have a sloppy reading in focus contexts only if it refers to a different manifestation than the one referred to by its antecedent.

- (18) will guide my formal proposal later.
- The term 'manifestation' is used in von Heusinger and Wespel 2007 (see references therein). Other terms for the same or closely related concepts are 'stages' (Carlson 1977), 'aspects' (Landman 1989; Geist 2019), 'guises' (Heim 1998), 'parts' (Paul 1994), 'personas' (Snir 2014).
- I will disregard any subtle differences there might be between the concepts these terms aim to capture, and will group them all under the heading '**Manifestation**'.
 - And I won't pursue a more precise definition of this term beyond the intuitive characterization I gave.

Intermediate Summary:

- **Puzzle 1:** What allows the ϕ -features on sloppy (focus-bound) pronouns not to be interpreted in alternatives?
- **Puzzle 2:** What allows for sloppy non-pronominals, and why are they so restricted?

- I will proceed as follows:
 - Propose a mechanism—*Focus Binding*—which generates both the correct readings of sloppy pronominals, and sloppy non-pronominals.
 - * It is a version of a theory proposed by Kratzer 1991 for related but different data.

⁹A temporal interpretation is not necessary; *only Mary looks like Mary* can be uttered in a custom party, conveying that she is the only one who looks like the 'typical' way she looks (sloppy).

¹⁰ It seems to me that verbs of comparison, the ones that show-up in Roeper sentences, lend themselves much more easily to different-manifestation/guise interpretations than non-comparison verbs. For the latter, contextual cues seem at best to marginally facilitate sloppiness.

(i) Context: *Mary and all her friends, now wealthy middle-class people, each see a picture of themselves when they were poor students.*
 (??) Only Mary feels sorry for Mary (?? sloppy)

Me and other people's intuition is that (i) is marginal to impossible, although some others I consulted with reported that they do get the sloppy inference when given appropriate context.

There is a crucial difference between predicates of comparison like *look like* and predicates like *feel sorry for*, which might explain the intuition of people like me. Observe that in (15), if the manifestations *weren't* different, the sentences would all be **logically trivial**, given the lexical semantics of the main predicate. For example, (15)a (even removing focus and *only* from it) would be trivial if the time-slice of the object was the same as the time-slice of the subject: anyone looks like they do at any point in time. There is no similar risk of logical triviality in (13a) or in (i). I speculate, then, that it is much easier to detect difference in manifestations (in the absence of overt material that indicates that) when logical triviality is at stake than when it isn't. For a somewhat related proposal about the relevance of logical triviality to non-literal interpretation of proper names, see Benbaji 2019.

- The proposal will predict sloppy non-pronominals to occur in principle freely.
- Then I will offer an account of the distribution, building on the observation I just made plus another assumption about the realization of focus binding.

Roadmap:

- In section 3 I set up the Focus binding system, accounting for the two undergeneration puzzles.
- In section 4 propose a theory for the distribution of sloppy non-pronominals.
 - The gist: a principle that requires sloppy elements to be realized as proforms ‘when possible’.

3 Proposal

3.1 Background: The foci-as-variables approach to generating Focus Alternatives

- Focus has a phonological side and a semantic side. On the semantic side, focus triggers a **set of alternatives** to the uttered sentence (Jackendoff 1972; Rooth 1985, 1992b; Kratzer 1991; Krifka 2006, a.o.).

(19) a. MARY laughed
 b. Set of alternatives: {Mary laughed, John laughed, Jill laughed,...} =
 {*x laughed*: *x* is an alternative to *Mary*}

(20) a. Mary LAUGHED
 b. Set of alternatives: {Mary laughed, Mary jumped, Mary danced,...} =
 {*Mary P*: *P* is an alternative to *laugh*}

- Jackendoff introduced a syntactic feature F on focused phrases.

“The semantic material associated with surface structure nodes dominated by F is the Focus of the sentence. To derive the [SET OF ALTERNATIVES]¹¹, substitute appropriate **semantic variables** for the focused material.” (Jackendoff 1972)

“Jackendoff’s semantic principle (the quote above – I.B.) generates a semantic object which has variables in the position of focus phrases. The [SET OF ALTERNATIVES] corresponding to *John_F painted the shed yesterday* is an open proposition ‘*y* painted the shed yesterday’, with a variable *y* in the position of the focused phrase.” (Rooth 2008)

(21) FOCI-AS-VARIABLES (Kratzer 1991; Wold 1996).
 a. Focused-marked constituents bear a distinguished **F(ocus)-index** (F₁,F₂,F₃,...) in the syntax.
 b. Each constituent in focus context has a normal interpretation (the ‘ordinary semantic value’) and along with it a **set of alternatives** (the ‘focus semantic value’).
 c. To generate the focus alternatives of a constituent S, form a set by abstracting over the F-marked constituents in S.

- For example:

(22) Logical Form (LF): [Mary_{F₁} laughed]
 a. *Mary laughed* (‘Ordinary semantic value’)

¹¹Jackendoff’s term was ‘presupposition’.

b. $\{x \text{ laughed: } x \text{ is an (appropriate) alternative of Mary}\}^{12}$
 $= \{\text{Mary laughed, John laughed, Jill laughed, ...}\}$ ('Focus semantic value')

- Focus-sensitive operators (*only, even, too, ...*) quantify over the set of alternatives of their sister.
- Focus-sensitive operators are **variable binders** and association with focus is a type of variable binding (Wold 1996)

(23) $\llbracket \text{only}_i \text{ S} \rrbracket^g$ is true iff $\llbracket \text{S} \rrbracket^g$ is true,¹³ and all the focus alternatives of S gotten by abstracting over constituents that bear F_i in S are false.

(24) $\llbracket \text{only}_1 \llbracket \text{Mary}_{F_1} \text{ laughed} \rrbracket^g \rrbracket^g$ is true iff *Mary laughed* is true and every proposition in (19) (different from the proposition that Mary laughed) is false

3.2 Focus-binding

- Once foci are indexed, in principle there's nothing that prevents *co-indexed* foci:

(25) **F-coindexation:** $[\dots \alpha_{F_1} \dots \beta_{F_1} \dots]$

- Kratzer (1991): at the level of LF, F-coindexation is possible
 - ... but only if the second F-coindexed element is inside an ellipsis site.
- My Proposal: We shouldn't restrict F-coindexation to ellipsis environments.
- The syntax of indexed-foci runs freely and can generate F-coindexation structures at will:

(26) **Syntax for F-indices:** Generate F-indices ('Alternative-activating features') freely in the syntax

- Two F-coindexed expressions will translate to **co-variation** across the focus alternatives.
 - The formal system in the appendix, moreover, makes sure that you can only ever F-coindex two elements if they have the same (ordinary) denotation.

(27) **Focus Binding:** A focus-sensitive operator OP_i binds every constituent in its scope which bears an occurrence of F_i

- In (28) *only*₁ binds both α_{F_1} and β_{F_1} .

(28) $(\text{only}_1) [\dots \alpha_{F_1} \dots \beta_{F_1} \dots]$ (where $\llbracket \alpha \rrbracket^g = \llbracket \beta \rrbracket^g$; see Appendix A)

3.3 Fixing the undergeneration problems

3.3.1 Features on bound pronouns

- ϕ -features on bound pronouns are interpreted, but don't project to the alternatives:

(29) Only I saw my parents

- LF: $\text{Only}_1 [I_{F_1} \text{ saw my}_{F_1} \text{ parents}]$
- Ordinary value of the sister of *only*₁: the speaker saw the speaker's parents
- Alternatives of the sister of *only*₁: $\{x \text{ saw } x\text{'s parents: } x \text{ is an individual}\}$

¹²For a theory of what counts as an 'appropriate' alternative, see e.g. Katzir (2007).

¹³This part is usually modeled as presupposition, but we can abstract away from this detail here.

- (30) Only Mary saw her parents
- a. LF: Only₁ [*Mary*_{F₁} saw her_{F₁} parents]
 - b. Ordinary value of the sister of *only*₁: Mary saw her(=Mary)'s parents
 - c. Alternatives of the sister of *only*₁: {*x* saw *x*'s parents: *x* is an individual}
- The focus-variable scopes over the features, thus making sure that they will not project to the alt's.
 - This overcomes the problem that affected the standard binding system, in which the features were scoping above the variable
 - The stipulation in (12) follows from the system and doesn't need to be stipulated separately.¹⁴
 - Long-distance (no C-command) sloppy pronouns are accounted for:
- (31) Only if *SUE* has trouble in school I would help **her** (✓ sloppy; based on Tomioka 1999:238)
- (32) a. Only if *SUE* has trouble in school would I help **her**. (repeated from (11))
 b. Only [if *Sue*_{F_i} *SUE* has trouble in school would I help her_{F_i}]
- (33) a. Only if *I* misbehave does the teacher call **my** parents (Bassi and Longenbaugh 2018)
 b. Only [if *I*_{F_i} misbehave does the teacher call my_{F_i} parents] (✓ sloppy)
- The focused phrase (*Sue*, *I*) doesn't need to enter any syntactic relationship with the sloppy pronoun; they are both co-bound by *only*.

3.3.2 Sloppy non-pronominals

- Roeper's cases are now easily accounted for with the same mechanism:
- (34) Only Mary still looks like Mary
- a. LF: Only₁ [*Mary*_{F₁} still looks like *Mary*_{F₁}]
 - b. Ordinary value of the sister of *only*₁: Mary still looks like Mary
 - c. Alternatives of the sister of *only*₁: {*x* still looks like *x*: *x* is an individual}

3.4 Phonology of F-coindexation structures

- But... there is no phonologically-detectable focus on sloppy pronouns, and arguably not on sloppy non-pronominals either.
 - Not even **second-occurrence focus** prosody (the stress pattern reserved for elements that are both focused and discourse-Given (see e.g. Schwarzschild 2019 and references therein).
 - The present theory, then (like Kratzer 1991's), is committed to the existence of elements that trigger alternatives but don't signal it prosodically.¹⁵
- (35) Given any F-index *F_i* in a structure ϕ : Only the linearly first occurrence of *F_i* is associated with the prosodic prominence attributed to Focus (nuclear stress within a certain phonologically-defined domain within ϕ)

¹⁴This is the theory I proposed in Bassi 2019. When I was almost done preparing this handout, I found out that Hezao Ke independently (and simultaneously) suggested virtually the same analysis, in his recent dissertation (Ke 2019).

¹⁵This puts me in a larger boat of theories that break the 1-1 correlation between alternative-activation and focus-prosody. Indefinite phrases, on many theories (Charlow 2019 and references therein), trigger sets of Hamblin(=Focus) alternatives, and the same is true for *wh*-phrases on e.g. Beck (2006)'s theory. The intonation on those elements doesn't sound like the intonation of contrastively stressed elements. Moreover, some analyses even posit alternative-activation by silent categories (traces, e.g. Romero 2013; PRO, e.g. Heim 1992:fn.13). "Sometimes the interpretational effects normally attributed to focus sensitivity are found even without (prosodic - I.B) focus marking." (Beaver and Clark 2008: p.117)

- (35a) implies that the mapping from Focus features to phonology is more indirect than standardly assumed: prosody is assigned to focus *variables*, not to each occurrence of a focus variable.
 - To capture the prosody facts, I distinguish between the first occurrence of a F-variable, and all the rest:
- (36) **The Focus of an operator** (Definition): The *Focus* of a focus-sensitive operator OP_i is the **linearly first** F_i -marked expression bound by OP_i .
- (37) **Focus-anaphoric elements** (Definition): If an F_i -marked constituent is not the Focus (of an operator OP_i), it is *Focus-anaphoric* (to the Focus of OP_i).
- (38) **Minimize Prominence! (principle)**: The Focus (of any operator OP) receives prosodic prominence, focus-anaphoric elements don't.

4 Coming to terms with the distribution of sloppy non-pronominals

- The system proposed so far predicts sloppy non-pronominals to appear freely.
 - But this runs into Geach's problem; we want to rule out:
- (39) a. Only Satan pities Satan (✗ sloppy)
 b. *LF: only [Satan_{F₁} pities Satan_{F₁}]
- (40) (Repeated from (15)-(16))
- a. Only Mary still looks like **Mary** (*the rest don't look like **they** used to 20 years ago*).
- b. In a foreign culture, only Mary can act like **Mary** (*the rest can't be **themselves***).
- c. In front of British royalty, only Fred still talks like **Fred** (*others put on a phony accent*).
- d. Only a very odd person still looks like **a very odd person** after using modern make-up techniques (*ordinary people don't look ordinary*). (sloppy indefinite)
- e. In these old pictures, only the living room still looks like **the living room**. (sloppy definite)
- f. (when we had dinner with the new neighbours,) Only Mary was being **Mary**.
- (41) **Generalization**: A non-pronominal N can have a sloppy reading in focus contexts only if it refers to a different manifestation than the one referred to by its antecedent.

4.1 Overview of proposal

- First assumption: the semantic differences between Roeper's cases and Geach's (non-Roeper) cases have a syntactic reflex: the former, but not the latter, host a **covert operator** that maps an individual to a contextually-salient manifestation.
- Second assumption: **focus-anaphoric NPs** (material F-coindexed with the focus, cf. the definition in (37)) have to **pronominalize if possible**
 - "pronominalize": have its lexical content elided at phonological form (Postal 1966, Elbourne 2005, Sauerland 2007, Patel-Grosz and Grosz 2017).
 - "if possible": given an independently-motivated theory of ellipsis (Lobeck 1995 and followers) which restricts the type of constituents that are allowable targets for deletion.
- The point: given the presence of the covert operator in the NP in Roeper sentences, the object will not be able to delete (that is, cannot pronominalize) - so it has to be pronounced.

- In non-Roeper cases, the absence of the operator will make it so that a focus-anaphoric expression has to delete its lexical content.

4.2 In detail

- The structure for (40a) is (42) (essential parts carry over to the other examples)

(42) only [[DP THE [NP **Mary**_{F₁}]] still looks_t like [DP THE [NP **Mary**_{F₁} **MANIF**_c]]

- Notable features:
 - Argumental DPs are represented with a determiner and a sister NP (see Matushansky 2006; Elbourne 2005; Fara 2015 for arguments); in English, when the NP consists just of a proper name, the determiner is the definite “the” which happens to be null.
 - A covert operator, MANIF(estation), is present. Its insertion is severely restricted and must be licensed at least by contextual cues.¹⁶
 - MANIF maps an individual, e.g. Mary, and returns the contextually-salient manifestation of that individual. In our made-up context of friends reunion, this was a manifestation in time, that is, Mary as she was 20 years ago.
- Appendix B gives a concrete semantics for (42).
- Other proposals can be found in the literature that utilize covert operators to shift the meaning of DP-internal stuff, e.g.: Perus and Sauerland 2003’s Concept Generator theory (see also Charlow and Sharvit 2014), and Benbaji 2019’s theory of some non-literal uses of names.
- Crucially, In the Satan example the structure for both subject and object is simple, with no MANIF:

(43) [DP THE [NP Satan]]

- Thus, in Roeper cases the NP part includes material that **breaks the structural identity** between subject and object, whereas in non-Roeper cases it doesn’t.
- The second piece – a stipulation on the realization of focus-binding:
 - (44) **Pronominalize!**: Let E be the smallest deletable constituent that dominates a focus-anaphoric element (=non-Focused F-marked material, see (37)). Then E must elide, *if E is Recoverable*.
 - (45) **Recoverability**: E is *recoverable* iff it has a semantically identical (= LF-identical) antecedent in the linguistic environment.
 - (46) **Deletable constituents (in English; Lobeck 1995 a.o.)**: The sister of D (NP; maximal projection of N), the sister of T/v (VP; maximal projection of V), the sister of C.
- With the stipulation in (44) we can now account for the distribution of sloppy non-pronominals.
- The object NP in (42) cannot be elided, according to (44): it isn’t recoverable, because there is no semantically-equivalent antecedent to it.

¹⁶Recall from footnote 10 that there’s an open question regarding how freely one can perceive two occurrences of an NP as referring to two different manifestations, given rich enough context. In the present discussion, this question translates to the question of how restricted is the distribution of the MANIF operator. My general prediction is that to the extent that one is able to perform the relevant mental activity carried out by MANIF, to that extent will she be able to read a non-pronominal sloppily.

- The part of the NP which consists just of the lexical material, namely *Mary_{F1}*, is recoverable, but it is not a deletable constituent according to (46)—it isn't the sister of D, the maximal projection of N.
- In (43), in contrast, there is no problem to elide the NP (crucially, the covert operator is not there).
 - So according to (44), if *Satan* in the object position were F-coindexed with the subject, it *must* elide, resulting in pronominalization of the object.
 - * For arguments that pronouns are spell-out of elided NP, see e.g. Postal 1966, Elbourne 2005, Sauerland 2007.

4.3 Further predictions

- On the above analysis, there is a covert operator that breaks syntactic identity between NPs, which allows for sloppy non-pronominals
- But nothing in the analysis requires that the material that breaks the identity be *covert*; it could just as well be overt stuff.
- The general prediction of the system is that a sloppy reading for a non-pronominal X will be possible if the (smallest) deletable constituent that contains X is not recoverable for deletion.
- Here I give examples that aim to test this prediction.

4.3.1 Sloppy adjectives

- (47) a. Only the BLUE marker produced a **blue** line. (✓ sloppy)
 b. Only the GREEN light stays **green** for just 10 seconds (✓ sloppy)
- (48) a. *Background: In most cases, if you adopt a cat you aren't easily influenced by the cat's temper.*
 Only people who adopt a GRUMPY cat can become **grumpy** themselves. (✓ sloppy)
 b. ↗ people who adopt a happy cat don't become happy themselves.

4.3.2 Sloppy nouns

- (49) *Context: The departments of linguistics and physics had a get-together, for everyone – students, professors and administration. Quickly, groups of like-minded formed: students talked to students, administration to administration and professors to professors. At the end of the day..*
 a. Only the STUDENTS of linguistics thought the **students** of physics were nice. (✓ sloppy)
 b. ↗: the professors of linguistics didn't think the professors of physics were nice.
- The account here successfully explains (49), only on the assumption that 'students of physics' is not recoverable for deletion.

- (50) Only the FATHER of Mary knows the **father** of John (✓ sloppy)

4.3.3 Sloppy verbs

- (51) a. *Background: I sometimes like to read poems, and sometime like to write poems.*
 And only when I READ a poem can I immediately **read** another one. (✓ sloppy)
 b. *Sloppy: When I write a poem, I can't immediately write another one.*

- **Hope:** this will generalize. And whenever there *is* the option of pronominalization/ellipsis, conveying the sloppy reading with the pronominal will be out.

- (52) a. Only when I SING do you want to do so as well (✓ sloppy)
 b. Only when I SING do you want to sing as well (? sloppy)

- (52a) is assumed to involve VP-ellipsis. It is predicted to block (52b) on the sloppy reading.

5 Concluding remarks

- I've proposed a unified solution to two puzzles of sloppy readings based on the mechanism of Focus-binding.
- My proposal for the distribution of sloppy non-pronominals was guided by empirical generalizations but was admittedly quite convoluted; some of its ingredients will be better off derived from simpler principles, unless they can find independent justification.
- But the intuition that I was led by is simple: sloppy elements strive to be realized with as minimal phonetic content as possible.
- To close, I point out to an indirect argument in favor of this way of looking at things.

5.1 Sloppy non-pronominals in Zapotec

- Lee (2003) reports that in San Lucas Quiavini Zapotec (SLQZ), sloppy non-pronominals are reported to be available freely:

- (53) Gye'eihlly-dihš r-ralloh r-yulààa'z-ènn Gye'eihlly (SLQZ; Lee 2003:98)
 Mile-only HAB-think HAB-like-1PL Mike
 'only Mike thinks we like Mike' (✓ *sloppy*)

- Strikingly, this language does not have anaphoric pronouns (it does have what you could call pronouns, but those appear to only have 'deictic' force and aren't used to refer to linguistic antecedents):

- (54) Zé'cy nnah Gye'eihlly nàiy me's g-uhc-ëng. (SLQZ; Lee 2003:86)
 thus NEUT-say Mike yesterday teacher PERF-be-3.SG.PROX
 'Mike_i said yesterday that he_{j/*i} was a teacher'

- SLQZ might be a language that 'wears focus-binding on its sleeves'.

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Appendix A: Formal semantics for indexed foci

- Based on Büring 2016: ch.10, Wold 1996.

(55) A focus assignment function h is a function from numerical indices $\{1, 2, 3, \dots\}$ to denotations.¹⁷

- Every constituent is interpreted relative to g and h . For constituents that aren't F-marked, h is idle:

(56) If α doesn't bear a F-index, $\llbracket \alpha \rrbracket^{g,h} = \llbracket \alpha \rrbracket^g$.

- An F-marked constituent is assigned a value by h , provided that the F-index is in the domain of h ; otherwise, the F-marking is 'switched off' and we resort to the normal semantic value:

(57) $\llbracket \alpha_{F_i} \rrbracket^{g,h} = \begin{cases} h(i), & \text{if } i \in \text{dom}(h); \\ \llbracket \alpha \rrbracket^{g,h}, & \text{otherwise} \end{cases}$

- To build focus alternatives, we first define the index-sensitive modifications of h . It defines what it means for an assignment to differ from another just in the value for a particular index.

(58) For any focus-assignment function h and index i ,

$$H_i^h := \{h' : h' \text{ is just like } h \text{ except for the value it assigns to } i.\} = \{h' : h' = h[i \rightarrow x], \text{ for some } x\}.$$

- The definition of focus alternatives makes reference to the preceding definition:

(59) **Variable-sensitive Focus Alternatives:**

$$\text{For any constituent } \alpha, \text{ assignments } g, h \text{ and F-index } F_i: \text{ALT}_i^{g,h}(\alpha) := \{\llbracket \alpha \rrbracket^{g,h'} : h' \in H_i^h\}$$

- Now we can define the interpretation of focus-binders, i.e. focus-sensitive operators. Entries for *only* and Rooth's (1992b) ' \sim '-operator are provided below. *only* is a propositional operator.

(60) $\llbracket \text{only}_i \alpha \rrbracket^{g,h}$ is defined iff $F_i \notin \text{dom}(h)$. If defined, =
 $\lambda w : \llbracket \alpha \rrbracket^{g,h}(w) = 1. \forall \beta \in \text{ALT}_i^{g,h}(\alpha) [\beta \neq \llbracket \alpha \rrbracket^{g,h} \rightarrow \beta(w) = 0]$

(61) $\llbracket \alpha \sim_i \mathbf{C} \rrbracket^{g,h}$ is defined iff $F_i \notin \text{dom}(h)$ and $\llbracket \alpha \rrbracket^{g,h}$ is defined and $\llbracket \mathbf{C} \rrbracket^{g,h} \subseteq \text{ALT}_i^{g,h}(\alpha)$.
 If defined, = $\llbracket \alpha \rrbracket^{g,h}$.

- Every F-marked constituent must be bound by a focus-sensitive operator.
- Multiple-focus constructions are captured by contra-indexing the multiple foci (and correspondingly multiple-indexing on the focus-sensitive operator).
- Each time an LF is processed, the initial h is empty (no variables in its domain). This means that focus-sensitive operators introduce the variable(s) that they bind in the course of computation.
- This system can compositionally capture focus-binding structures, and also nested foci dependencies of the kind discussed by Wold (1996) (which provide further motivation for an indexed-foci based semantics for focus).
- Recall, F-indices are freely generated on expressions in the syntax, (26).
 - One might worry that this allows F-coindexation between two expressions that have different ordinary denotations, thus generating unattested 'mixed' readings like in (62).

¹⁷ F-indices are actually pairs $\langle n, \tau \rangle$ of a number and a semantic type, and the domain of a focus-assignment function is a set of such pairs. For convenience, however, we will represent only the number part of the index because it is easy to read the semantic type off of the expression it attaches to.

– The worry is alleviated by the assumption in (63) (already made in Rooth 1992b).

(62) *Only John_{F₁} pities Mary_{F₁}

(predicted but unattested meaning: *John pities Mary, and no one pities themselves*; filtered out by (63))

(63) *The ordinary meaning of a constituent α is always in the set of alternative to α :*

For any constituent α , assignments g, h and F-index F_i that appears free in α : $[[\alpha]]^{g,h} \in ALT_i^{g,h}(\alpha)$
(see Rooth 1992:90)

– (63) filters out (62) because for (63) to hold there has to be an h' which assigns a value to the variable 1 in such a way that the resulting proposition is equivalent to the prejacent of *only*, i.e. *John pities Mary*. But no assignment function can supply the same variable two distinct values.

* (63) thus renders unnecessary a separate syntactic condition on what can be F-coindexed.

Appendix B: A simple semantics for a Roeper LF (removing focus)

- The LF in (64) is referred to from (42). It is basically the same except for the removal of *only* and focus, the addition of the IDENT type-shifter to resolve type-mismatches (given my assumptions about the syntax and other denotations) and it being more explicit about the scope of *still*.

(64) $\underline{\text{LF}}$: still $[\lambda t \text{ [DP THE [NP IDENT [Mary}_t\text{]] looks}_t \text{ like [DP THE [NP IDENT [Mary}_t \text{ MANIF}_c\text{]]}]]]$

(65) $[[\text{Mary}]] = \lambda t. \text{Mary at time } t.$

(66) $[[\text{MANIF}_c]]^C = \lambda x_e. \text{the salient manifestation of } x \text{ given context } C.$

(67) $[[\text{IDENT}]] = \lambda x_e. \lambda y_e. x = y$ (Partee 1987)

(68) $[[\text{THE IDENT Mary}_t \text{ MANIF}_c]]^C = \text{the salient manifestation of } \text{Mary-at-}t \text{ given } C.$

(69) $[[\text{still}]]^{t_0} = \lambda p_{\langle i,t \rangle} : \exists t < t_0 \text{ (and } t \text{ is contextually salient) s.t. } p(t) = 1. p(t_0) = 1.$

(70) $[[\text{(64)}]]^{t_0, C} : \exists t < t_0 \text{ s.t. Mary-at-}t \text{ looks at-}t \text{ like Mary-20-years-ago.}$
. Mary-at- t_0 looks at- t_0 like Mary-20-years-ago.

- The Details of the analysis will probably vary depending on the exact sentence, context and type of manifestation involved in a Roeper-type example.
- Regarding MANIF, footnotes 10 and 16 raised the possibility that for some speakers, it is highly restricted and cannot be licensed merely by contextual salience, but is possible only to save the structure from logical triviality.
- Those speakers might be guided by the principle in (71):

(71) **Avoid Logical Triviality** (tentative): The covert shifter ‘MANIF_c’ can be inserted only in order to avoid logical triviality.