Binding into superlative descriptions*

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Abstract Attributive superlative adjectives are famously ambiguous between readings in which they compare elements of the description they modify, and readings in which they compare competitors to some description-external element of the sentence. The literature is braided with two analytical origin stories for these different interpretations. One strand of analysis attributes the difference in meaning to a difference in the compositional scope of the superlative morpheme. The other attributes the difference to a difference in how the superlative's implicit domain of quantification is resolved. Here, I present new data showing that pronouns in superlative descriptions have sloppy readings, akin to familiar cases of adverbial association with focus, and I argue that these readings are compatible with scope-taking analyses, but cannot be generated by any plausible variety of domain restriction.

Keywords: superlatives, binding, sloppy readings, focus, scope, domain restriction

1 Introduction

Superlative descriptions are often underspecified. Imagine that John and several friends take a trip to the library, and each picks out a book. In this context there are at least two ways to interpret the sentence in (1). On one understanding of the object description, its *absolute reading*, the sentence entails the existence of a single book longer than all the others in the library, and asserts that John picked out that book. This is a reading on which the superlative quantifies over the entire relevant portion of the extension of the nominal 'book', selecting the longest among them. Alternatively, on its *relative reading*, (1) may merely entail that John picked out a longer book than any of his friends did, regardless of whether he picked out the very longest book in the building, or whether such a book even exists.

(1)   John picked out the longest book.

Broadly speaking, there are two kinds of theories that attempt to explain how the superlative embedded in the direct object can appear to quantify over alternatives to the subject (John and his friends). The first interprets the superlative in situ, but treats the superlative's comparison class as a context-sensitive parameter of the discourse, on par with vanilla cases of quantificational domain restriction. So just as 'every student' may be understood to quantify only over students in the current room rather than every student in the world, the superlative in (1) may quietly quantify over a restricted set of books, namely those picked out by John and co. Among analyses of this variety, there are those that attribute the restricted comparison class to matters of more or less free pragmatic reasoning (e.g., Gutiérrez-Rexach 2006; Teodorescu 2009), and those that fix the class as a function of the sentence's focus structure (e.g., Sharvit & Stateva 2002; Tomaszewicz 2015).

The second class of theories hypothesizes that relative readings arise when the superlative is interpreted outside of the description it occurs in. With scope above the verb phrase or even above the entire sentence, the superlative is *compositionally* situated in an ideal position to evaluate various potential individuals that could saturate the same argument slot as the subject with respect to their performance on the degree property that the superlative abstracts over. In (1), for example, the superlative would compare John with the rest of the gang on the degrees d to which they can be said to have picked out a d-long book. The sentence is true if John exceeds his friends. Scopal theories also differ in the role that focus plays (e.g., Romero 2013 vs. Bhatt 2006).

This paper introduces to the debate a novel pattern of binding data, and argues that the paradigm is better explained by the latter, scopal, theories of superlative meaning. The principal example is illustrated in (2). Returning to the library scenario, imagine now that John, Mary, Sue, and Fred each pick out a dozen or so books to read. Just to be cute, some of them choose books with titles that include the names 'John', 'Mary', 'Sue', and/or 'Fred'. In this scenario, (2) will be interpreted as saying one of two things. It either entails, as indicated in (2a), that John picked out fewer books with the word 'John' in the title than any of Mary, Sue, or Fred did. Or, as indicated in (2b), it entails that John picked out fewer books with 'John' in the title than Mary did with 'Mary' in the title, Sue did with 'Sue' in the title, or Fred did with 'Fred' in the title.

(2)   John picked out the fewest books with his name in the title.

    a. ✓John picked fewer books with John's name in the title than anyone else picked with John's name in the title

    b. ✓John picked fewer books with John's name in the title than anyone else picked with their own name in the title

The so-called sloppy reading of (2) paraphrased in (2b) is difficult for domain-restriction theories of superlatives to capture. Roughly, the trouble for such analyses is that no matter what set of objects is taken to stand in for the implicit comparison class (regardless of how such a class is identified in practice), the superlative has to quantify over the noun phrase 'books with his name in the title'. But from the superlative's point of view, trapped as it is within the grammatical object, the pronoun in that description is rigidly bound to John. So intersecting this set — books with 'John' in the title — with whatever the comparison class turns out to be will necessarily return a set containing only John's books, which precludes any truth conditions along the lines of (2b). I will argue in fact that the only options available to such theories are to give up altogether on semantically interpreting the noun phrase or to introduce a family of superlative operators prepared to steal and rebind any variables in their complements. I evaluate the prospects of these ideas, and conclude that to the extent that they can be made to work, they take us a long way away from a parsimonious, purely pragmatic theory of domain restriction.

Scope-taking theories of superlatives have no comparable difficulty with the sloppy reading in (2b), or the strict reading above it. On every such theory, the superlative quantifies over a constituent large enough that the pronoun can be bound — strictly or sloppily — within it, which determines the shape of the property against which competitors are compared. This is a fairly straightforward point in favor of scopal theories of superlative semantics, though as far as I can tell the data has been overlooked in the literature so far.

2 Data

2.1 Strict and sloppy pronouns

In a variety of constructions that emphasize some kind of contrast or semantic parallelism, pronouns can give rise to a well-studied type of ambiguity. The classic case, due to Ross 1967, is verb phrase ellipsis. Ross observed that sentences like (3) are ambiguous between what have come to be called *strict* and *sloppy* interpretations (Ross 1969). On its strict reading, (3) contrasts John and Bill with respect to the property of scratching John's arm, as paraphrased in (3a). In this case, it is natural to think that the pronoun happens to refer to John without being in any way grammatically linked to the subject. The sloppy reading of (3), on the other hand, interprets the pronoun as genuinely bound by its antecedent, and thus contrasts John and Bill with respect to the property of scratching one's own arm. This gives rise to truth conditions paraphrased in (3b).

(3) John scratched his arm but Bill did not. [cf. Ross 1967: (5.132)]

    a. ✓John scratched John's arm but Bill didn't scratch John's arm   *Strict*

    b. ✓John scratched John's arm but Bill didn't scratch Bill's arm   *Sloppy*

Of special interest to this paper, association with focus also creates opportunities for strict/sloppy ambiguities. Building on Chomsky's (1976) observation that the alternatives evoked by focus depend on whether a pronoun is taken to corefer with the focused constituent or to be bound by it, Rooth (1985) showed that this sensitivity can have truth-conditional ramifications in the presence of a focus-sensitive adverb like 'only'.

(4) Only JOHN was betrayed by the person he loves.   [cf. Rooth 1985: (59a)]

    a. ✓Only John $\lambda x.\, x$ was betrayed by the person John loves

    b. ✓Only John $\lambda x.\, x$ was betrayed by the person x loves

For instance, the strict reading of (4) in (4a), on which the pronoun merely refers to John, entails that nobody other than John was betrayed by John's love. The sloppy reading (4b), on which the pronoun is bound by the focus phrase 'JOHN', entails that nobody else has the property of having been betrayed by their own love.

2.2 Absolute and relative superlatives

As mentioned in Section 1, interpretations of superlatives are often classified by whether or not linguistic material outside of the superlative description itself influences the objects that are compared. Absolute interpretations, as in (5a), consider all (relevant) objects that satisfy the description, in this case all provinces in Canada. Since Nunavut is the largest province in Canada, the question is equivalent to asking which student visited Nunavut. Relative interpretations, as in (5b), instead compare only those (relevant) objects that stand in the expressed relation to some competitor of the superlative's correlate (the winner). In this case, that means comparing only those provinces that were visited by some student, so that the question effectively asks which student visited a larger province than any of the other students.

(5) Which student visited the largest Canadian province?

    a. ✓Who visited a province larger than any other province?

    b. ✓Who visited a province larger than any province visited by anyone else?

There is a large literature on relative superlatives and the environments that condition them. The most important empirical generalization for the argument that I want to make here is that relative superlative interpretations associate with focus (see, among others, Jackendoff 1972, Szabolcsi 1986, Gawron 1995, Heim 1999, Sharvit & Stateva 2002, Gutiérrez-Rexach 2006, Tomaszewicz 2013). Consider the following examples, adapted from Szabolcsi 1986.

(6) When did JOHN get the fewest letters from Peter?

  a. ✓When did John get fewer letters from Peter than anybody else did?
  b. #When did John get fewer letters from Peter than he did from anyone else?

(7) When did John get the fewest letters from PETER?

  a. #When did John get fewer letters from Peter than anyone else did?
  b. ✓When did John get fewer letters from Peter than he did from anyone else?

The question in (6) unambiguously asks the listener to compare John to Peter's other correspondents, and to provide the time at which John was the least attended to of the bunch. In contrast, the question in (7) unambiguously asks about John's other correspondents, and is satisfied only by times in which Peter paid him less attention than he did the others. Note that during the times that positively answer the first question, John may well have not been in communication with anybody but Peter, though it presupposes that Peter must have at that time written letters to several people. On the flipside, during the times that answer the second question, Peter may well have only been writing to John, as long as John received letters from at least a few people.

2.3 Strict and sloppy relative superlatives

Repeating the morals of Sections 2.1 and 2.2: (i) focused expressions sometimes bind pronouns; (ii) in the presence of focus-associating operators, this can have truth conditional consequences, as in (4); and (iii) relative superlatives are focus-associating operators. As expected then, pronouns anteceded by the correlates of relative superlatives are ambiguous between strict and sloppy interpretations. For example, Gawron (1995) points out that the sentence in (8) has two readings. Understood strictly, it entails that of all the gifts given to Jean's sister, the most expensive came from Jean herself. Understood sloppily, it entails that of all the gifts given from one sister to another, the most expensive went from Jean to Jean's.

(8) JEAN gave her sister the most expensive book.   [Gawron 1995: (8)]

  a. ✓J gave J's sister a more expensive book than anyone else gave J's sister
  b. ✓J gave J's sister a more expensive book than anyone else gave their sister

As a special case of this, consider (9), in which a focus phrase ('JOHN') antecedes a pronoun ('his') that occurs inside an associated superlative description ('the fewest voters from his district'). Just as in the ditransitive example from Gawron, the sentence in (9) supports two interpretations, depending on whether the pronoun is bound by, or merely corefers with, the subject. In the first case, (9a), the sentence entails that the oldest picture that anyone has of John's parents is a picture that John has of them. In the latter case, (9b), the sentence entails that the oldest picture that anyone has of their own parents is a picture that John has of his.

(9)   JOHN has the oldest picture of his parents.

     a. ✓ J has an older picture of J's parents than anyone else does of J's parents
     b. ✓ J has an older picture of J's parents than anyone else does of their parents

(10)   JOHN climbed the closest mountain to his house.

     a. ✓ J climbed a mountain closer to J's house than anyone else did
     b. ✓ J climbed a mountain that was closer to J's house than any mountain climbed by anyone else was to their house

Notice also that the same range of strict and sloppy relative readings is available to pronouns in the superlative's adjectival (rather than nominal) complement. For example, in (10) the bound pronoun in the adjective phrase 'close to his house' may strictly refer to John, as in (10a). In this case the superlative compares individuals with respect to how close their climbed mountains were to John's house. Or the pronoun may refer sloppily to the subject of comparison, as in (10b), in which case the superlative compares individuals with respect to how close their climbed mountains were to their own houses. Sloppy readings in these adjective phrase configurations will be relevant when we consider the interpretive possibilities opened up by reconstruction in Section 5.2.

3   Theories of superlative ambiguities

3.1   Scope and domain restriction

There are two major classes of relative superlative analyses. The first, due to ideas in Szabolcsi 1986 and Heim 1985, 1999, attributes the absolute/relative ambiguity of superlatives to the variable scope of the superlative morpheme. The second, due to other ideas in Heim 1999, attributes the distinction instead to different possible resolutions of the implicit domain restriction of the superlative quantifier. Both kinds of theories typically incorporate focus-sensitivity by identifying the superlative's comparison class with the alternatives evoked by some continuation in the sentence. Though there is some variation in the mechanics assumed by different authors, for concreteness I present Heim's (1999) original proposals. Also I adopt the assumptions in Table 1 from Rooth (1985: Ch. II, Sec. 3, Def. (41)) regarding semantic composition, where I gives definitions for lexical items, and g is a metavariable ranging over assignments from object-language variables to values.[1]

Consider the scopal approach first, shown in Figure 1, applied to the example in (11). Since alternatives are introduced by the focused subject, 'JOHN', the smallest

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1 Notational conventions: Function application of f to x is written as $f x$. Parentheses are used only for grouping. Functions of multiple arguments are abbreviated: $(\lambda xy. \cdots) \equiv (\lambda x \lambda y. \cdots)$. As in Heim & Kratzer 1998, $\lambda x : p . q$ represents a partial function defined only when p is true.

Rule	Form: $\cdot$	Denotation: $\llbracket \cdot \rrbracket$	Focus Value: $\{\!\!\{ \cdot \}\!\!\}$
Lexical items	c	Ic	$\{\llbracket c \rrbracket\}$
Branching nodes	$[\varphi \ \psi]$	$\llbracket \varphi \rrbracket \ \llbracket \psi \rrbracket$	$\left\{ \lambda g . f g (xg) \; \middle\| \; \begin{matrix} f \in \{\!\!\{ \varphi \}\!\!\}, \\ x \in \{\!\!\{ \psi \}\!\!\} \end{matrix} \right\}$
Abstraction	$[\lambda v \ \varphi]$	$\lambda gx . \llbracket \varphi \rrbracket \, g^{v \mapsto x}$	$\{ \lambda gx . p \, g^{v \mapsto x} \mid p \in \{\!\!\{ \varphi \}\!\!\} \}$
Variables	v	$\lambda g . g v$	$\{ \lambda g . g v \}$
Focus marking	φ_{F}	$\llbracket \varphi \rrbracket$	$\mathscr{D}_\tau$, where φ is of type τ
Focus association	$[\sim v \ \varphi]$	$\lambda g : g v \subseteq \{\!\!\{ \varphi \}\!\!\} . \llbracket \varphi \rrbracket \, g$	$\{\llbracket \varphi \rrbracket\}$

Table 1 Modes of combination

constituent at which there could be focus-induced variation is at the level of the entire sentence. The superlative then, by hypothesis, scopes over the sentence, taking the focus alternatives of its continuation as its restrictor and the ordinary value of that continuation as its nuclear scope. What it says of those two pieces is that every degree property generated by varying the focus (i.e., 'John') results in a strict subset of the degrees obtained by leaving the focus as it is. In this case, that amounts to the proposition that however good a drummer anyone heard, John heard a drummer at least as good as that.[2]

(11)   JOHN heard the best$_C$ drummer.

     a. ✓John heard a better drummer than anyone else did

If the superlative's scope is instead limited to the DP that contains it, as in Figure 2, then the entire superlative DP must take scope over the focus domain in order to create a set of alternatives that the superlative can quantify over (more on this in Section 5.1). The restrictor of the superlative is then identified with the focus alternatives of the continuation of its definite host. So in Figure 2, C contains for each of John's competitors, the property of being something that that competitor heard. Using this domain of quantification, the superlative returns the property that x has if out of all the things in any of the sets in C, x maximizes the degree relation it scopes over. In this case, that amounts to saying that x is something that was heard by someone, and which scores better on the d-good drummer scale than any of the other things that were heard. The sentence then entails that the unique individual with that property was heard by John.

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2 See, among others, Szabolcsi 1986; Heim 1999; Sharvit & Stateva 2002; Krasikova 2012; Coppock & Beaver 2014; Bumford 2017a; Coppock To appear for discussion of ties between competitors and the role of the definite determiner in relative readings.
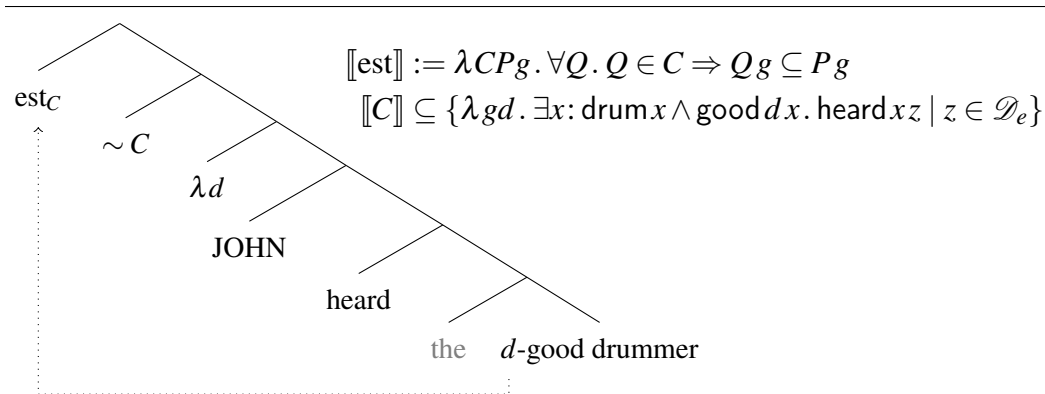
est$_C$

$\sim C$

λd

JOHN

heard

the d-good drummer

$$\llbracket \text{est} \rrbracket := \lambda CPg.\,\forall Q.\,Q \in C \Rightarrow Qg \subseteq Pg$$

$$\llbracket C \rrbracket \subseteq \{\lambda gd.\,\exists x\colon \mathsf{drum}\,x \wedge \mathsf{good}\,d\,x.\,\mathsf{heard}\,x z \mid z \in \mathscr{D}_e\}$$

Figure 1   Scopal relativity: DP-external superlative (e.g., Heim 1999; Schwarz 2005; Krasikova 2012; Romero 2013; Howard 2014)

the

est$_C$

λd d-good drummer

$\sim C$

λx

JOHN

heard x

$$\llbracket \text{est} \rrbracket := \lambda CRgx.\,\exists d.\,\{x\} = Rgd \cap \bigcup\{cg \mid c \in C\}$$

$$\llbracket C \rrbracket \subseteq \{\lambda gx.\,\mathsf{heard}\,x z \mid z \in \mathscr{D}_e\}$$
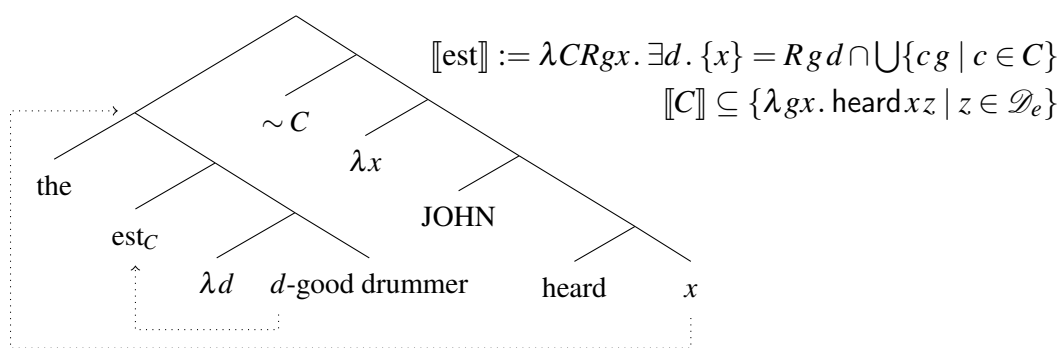
Figure 2   Restrictionist relativity: DP-internal superlative (e.g., Heim 1999; Sharvit & Stateva 2002; Beaver & Clark 2008; Tomaszewicz 2015)

4   Sloppy superlative descriptions challenge domain-restriction theories

4.1   Description-external pronouns

Strict and sloppy pronouns outside of the superlative description, as in Gawron's (1995) example (8), do not pose a threat to either scopal or restrictionist analyses. Both kinds of theories predict both kinds of readings.

Which reading emerges in these cases is, to a first approximation, determined by whether the pronoun is bound by the focus phrase or merely coreferential with it. But since the operative pronouns in these cases are outside of the superlative's DP, this ambiguity is entirely independent of the superlative morpheme's scope. The derivations in (12) provide examples of the two readings using the reference analyses sketched above. If the pronoun is bound by the focus, then it covaries with

the focus alternatives and generates a sloppy comparison class C. Otherwise, if its index just happens to be associated with Mary, then the pronoun does not covary with the alternatives and generates a strict comparison class. In (12a), C is the set containing for each alternative to Mary the prices of books that that person gave their/Mary's sister. The superlative then says that the most inclusive such price-list is Mary's (the one that subsumes all the others). In (12b), C is the set containing for each alternative to Mary the books that that person gave their/Mary's sister. The superlative then says that the most expensive such book is in Mary's set.

(12)   MARY gave her sister the most expensive book.   [rep. (8)]

a. Scopal superlative: ✓strict and ✓sloppy DP-external pronouns

$$\sim C \longrightarrow \left\{ \begin{array}{l} \lambda gd \,.\, \text{M gave M/M's sister a } d\text{-expensive book,} \\ \lambda gd \,.\, \text{J gave J /M's sister a } d\text{-expensive book,} \\ \lambda gd \,.\, \text{S gave S /M's sister a } d\text{-expensive book} \\ \vdots \end{array} \right\}$$

b. Restricted superlative: ✓strict and ✓sloppy DP-external pronouns

$$\sim C \longrightarrow \left\{ \begin{array}{l} \lambda gx \,.\, \text{M gave M's/M's sis } x, \\ \lambda gx \,.\, \text{J gave J 's/M's sis } x, \\ \lambda gx \,.\, \text{S gave S 's/M's sis } x \\ \vdots \end{array} \right\}$$

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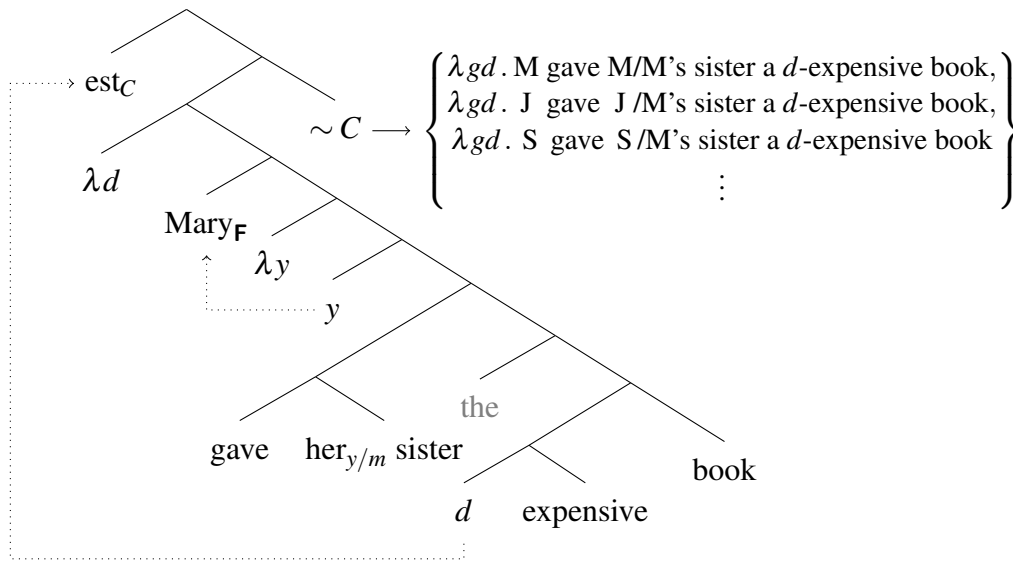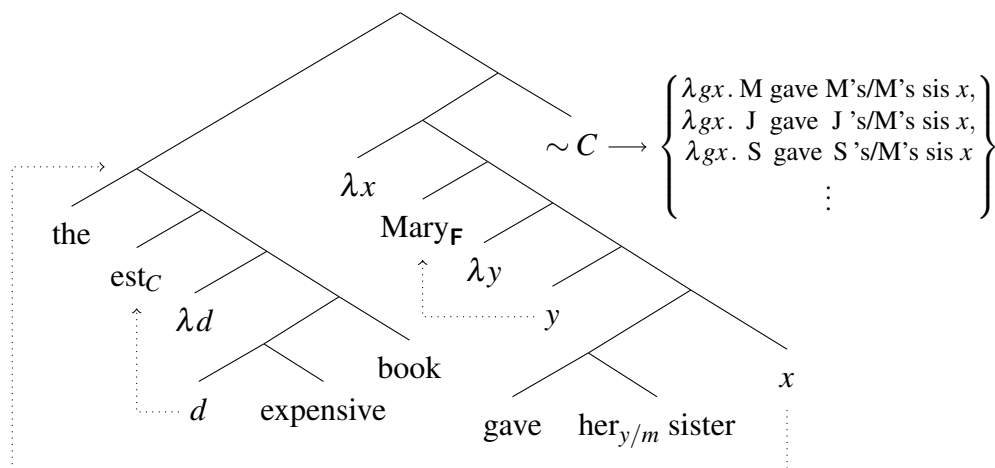
4.2 Description-internal pronouns

In addition to these description-external pronouns, theories that read the comparison class C off the scope of the superlative morpheme have no trouble deriving strict and sloppy readings for description-internal pronouns as well. For the purposes of illustration, consider a board game with the ambiguous rule in (13a).[3]

(13) a. Whoever collects the most tokens of her color wins!
      b. MARY collected the most tokens of her color.

And in light of this rule, consider the reading of (13b) on which it declares Mary the winner. If the original rule is understood strictly, then it ensures victory for any player z who maximizes the relation $\lambda xn . x$ collected n-many tokens of z's color. For instance, if Mary's color is red, then (13b) ought to entail that Mary collected more red tokens than anyone else did. Note that this interpretation makes for a quite friendly game, since everyone could in principle be a winner simultaneously. That is, if Mary's color is red, John's blue, and Fred's green, then it is imaginable that Mary ends up with more red tokens than the others do, John with more blue tokens, and Fred with more green tokens. In this case, they have *all* maximized their respective relations. That's fine. That is one kind of game that (13a) could describe.

If on the other hand (13b) is understood sloppily, then it guarantees that Mary maximizes the relation $\lambda xn . x$ collected n-many tokens of x's color. In other words, where before, under the strict interpretation of the rule, the object of the game was to collect more tokens of your color than other people do *of your color*, here, under the sloppy interpretation of the rule, the object of the game is to collect more tokens of your color than other people do *of their colors*. Unlike the strict version, the sloppy version of the game does not permit multiple winners, since only one person x can collect more of their$_x$ tokens than anyone else y collects of their$_y$ tokens. This game is cutthroat.

The scopal LFs generating these readings do not differ in any substantive way from those in (12a). If the pronoun is bound by Mary, then the superlative's comparison class contains each player's quantity of personally-colored tokens, and the sentence says that Mary's personally-colored tokens outnumber anyone else's. If the

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3 This example is based on the (genuinely ambiguous) instructions for the game *Color Pop*, quoted below:

(i)   At this point, [...] Whoever has the fewest tokens of her color on the board wins! If two or more players are tied, they compare the tokens they collected during the game; whoever collected fewer of his or her color wins.

The main text will primarily use quantity superlative examples like this one because they force relative interpretations, but readers suspicious that quality and quantity superlatives have different structures should feel free to substitute 'most' with 'most valuable' throughout; the relevant judgments and arguments are unchanged.

pronoun accidentally refers to Mary, then the superlative's comparison class contains each player's quantity of Mary-colored tokens, and the sentence says that Mary's Mary-colored tokens outnumber anyone else's.

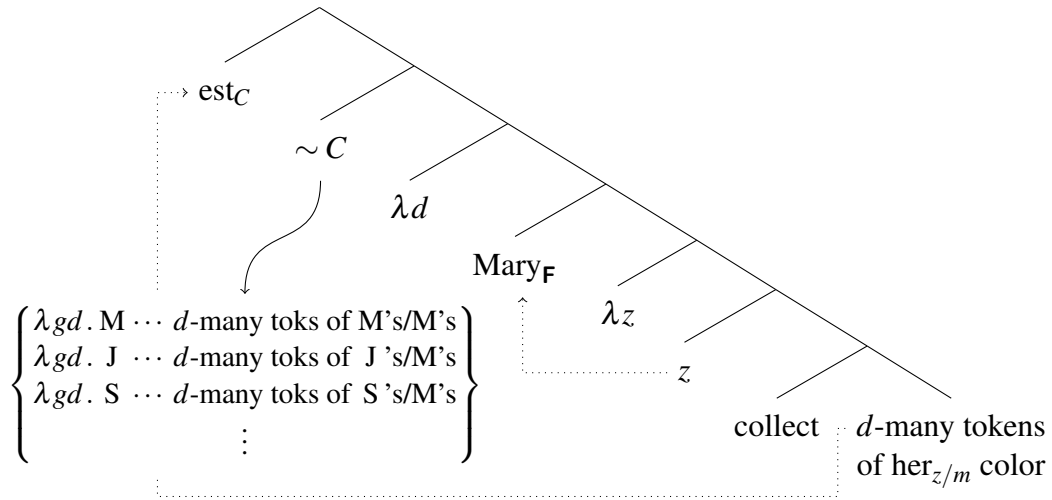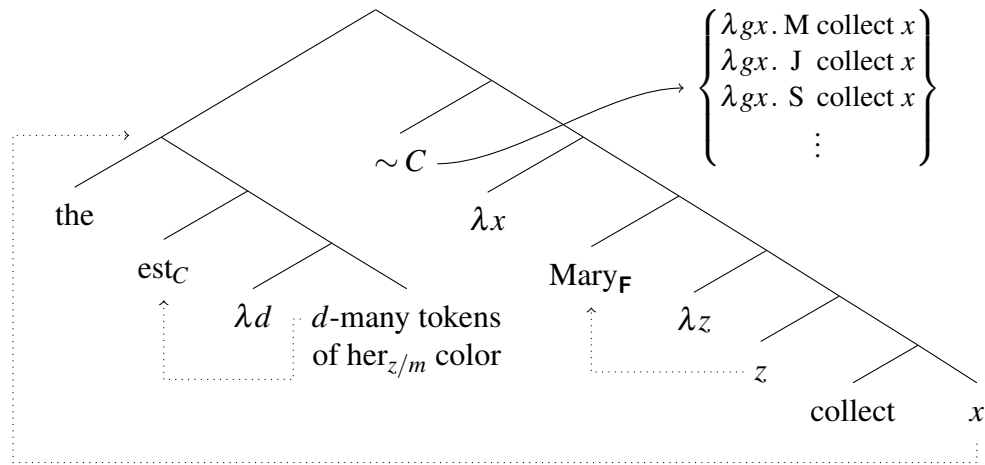(14)   Scopal superlative: ✓strict and ✓sloppy DP-internal pronouns

$$\left\{ \begin{array}{l} \lambda gd.\, \mathrm{M} \cdots d\text{-many toks of M's/M's} \\ \lambda gd.\, \mathrm{J} \cdots d\text{-many toks of J's/M's} \\ \lambda gd.\, \mathrm{S} \cdots d\text{-many toks of S's/M's} \\ \qquad\qquad \vdots \end{array} \right\}$$

est$_C$

$\sim C$

λd

Mary$_\mathbf{F}$

λz

z

collect d-many tokens of her$_{z/m}$ color

(15)   Restricted superlative: ✓strict but not ✗sloppy DP-internal pronouns

$$\left\{ \begin{array}{l} \lambda gx.\, \mathrm{M} \text{ collect } x \\ \lambda gx.\, \mathrm{J} \text{ collect } x \\ \lambda gx.\, \mathrm{S} \text{ collect } x \\ \qquad\qquad \vdots \end{array} \right\}$$

the

$\sim C$

λx

est$_C$

λd d-many tokens of her$_{z/m}$ color

Mary$_\mathbf{F}$

λz

z

collect x

In contrast, our operational restrictionist theory will only generate the strict reading of (13b), as should be apparent from the derivation in (15). The comparison class here includes for each player the token-sums they collected, so if the pronoun in the description happens to refer to Mary, then the sentence says that the largest Mary-colored token-sum in the comparison class was in fact collected by Mary herself. But crucially, in this derivation the entire superlative description outscopes the focus

phrase, so there is no way for the superlative's correlate to bind the pronoun, and thus no way for the pronoun to covary with alternatives to Mary.

This is the basic pressure that sloppy readings put on restrictionist theories. The focus phrase ought to outscope the superlative description in order to make things sloppy; but the superlative description ought to outscope the focus phrase in order to make things relative. In the remainder of the paper, I consider potential revisions to this paradigm restrictionist analysis, and conclude that they either do not help in deriving sloppy superlative readings or face large independent empirical challenges.

5 Nonsolutions to the restrictionist theory

5.1 Invert the relative scope of the focus phrase and superlative description

Recapping, the apparent issue for restrictionist theories of relative readings is that the superlative description outscopes the focus phrase that would need to bind into it in order to induce sloppiness, as schematized in (16).

(16) $\quad$ [the est$_C$ λd [d- $\cdots$ her$_z$ $\cdots$]]
$$[[\lambda x \text{ Mary}_{\mathsf{F}} \ \lambda z \ z \ \cdots \ x] \sim C]$$

The two obvious remedies to this problem are to scope the focus phrase so that it continues to c-command the superlative description, or to refrain from scoping the description in the first place, as shown in (17) and (18) below. The first option is a perfectly legitimate derivation. The description takes scope over the focus structure that determines its domain, and then the name 'Mary' takes scope over the description (presumably this would not represent a weak crossover violation, since the name surface c-commands the pronoun that it comes to bind). But it results in strict truth conditions. Though the pronoun is now bound by the subject, the binding happens entirely outside of the focus domain that the superlative associates with. As a result, the superlative description is denotationally equivalent to 'the most red tokens', or whatever color Mary is playing.

(17) $\quad$ Mary $\quad \lambda z$
$\qquad$ [the est$_C$ λd [d-many $\cdots$ her$_z$ $\cdots$]] $\qquad \left\{ \begin{array}{l} \lambda g x. \text{ M collect } x \\ \lambda g x. \text{ J collect } x \\ \lambda g x. \text{ S collect } x \\ \vdots \end{array} \right\}$
$\qquad\qquad$ [[λx z_{F} collect x] $\sim C$]

(18) $\quad \sim C$ [Mary$_{\mathsf{F}}$ λz z collect [the est$_C$ λd [d-many $\cdots$ her$_z$ $\cdots$]]]

The second option — leaving the description in its surface position within the scope of its correlate — may not be legitimate at all. In (18), the only constituent

with a nontrivial focus value is the entire sentence. That means the comparison class C will be a set of *propositions*, not entities. So for starters, the superlative morpheme would have to be rewritten to quantify over pieces of information rather than objects (see Pancheva & Tomaszewicz 2012 for related discussion). But it's not even clear what the propositions in C would be. Each one should entail for some particular alternative to Mary, say u, that u collected the most_C tokens of u's color. Under what circumstances does someone collect the most_C tokens of their color? That depends on what C is! So even if some modal denotation for the superlative were found that could turn these sets of worlds into sums of tokens, it would still have to ensure that the following fixed-point semantic equation is satisfied: $[\![C]\!] \subseteq \{\lambda g . [\![[z \, [\text{collect} \, [\text{est}_C \, \lambda d \, [d\text{-many tokens of } z\text{'s color}]]]]]\!] \, g^{z \mapsto u} \mid u \in \mathscr{D}_e\}$. But it's far from obvious that any combination of C and $[\![\text{est}]\!]$ actually meets this constraint.[4]

5.2 Reconstruction

A more promising scope-reverting analysis is to scope the superlative description as in Heim 1999, but partially *reconstruct* the nominal content. This way the superlative operator still steers clear of the focus domain that restricts it, but the pronoun itself sinks back into the binding domain of correlate.

In fact, this will sort of work! Take the LF in (20), for instance, along with the "trace conversion rule" in (19) that interprets a node dominating a trace t and a copy φ. Given this rule, the nuclear scope of the superlative description in (20) denotes the property holding of any sum x in Mary's color such that Mary collected the y equal to it. In other words, it is the partial function that takes token-sums of Mary's color to true iff Mary collected them. The focus value of this property abstracts over alternatives to Mary, which crucially also abstracts over the token color that restricts the domain of the function. So the comparison class C ends up as the set containing for each player just those token-sums of *their* color that they collected. The superlative selects the largest of these, and the superlative description says of this largest sum that indeed it was Mary who collected it.

(19) $[\![[t \, \varphi]]\!] := \lambda g . \iota y . [\![\varphi]\!] \, g \, y \wedge y = [\![t]\!] \, g$ [Fox 2003]

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4 The situation is quite similar to well-known cases of ACD. Because the VP ellipsis site ε in (ia) is contained in the only potential VP antecedent α, no surface-scope derivation will satisfy the identity constraints of ellipsis. Only by scoping the object, as in (ib), is a potential antecedent recovered.

(i) a. John $[_\alpha$ read every book Mary $[_\varepsilon$ did $]$ $]$
     b. [Every book Mary $[_\varepsilon$ did $]$ $]$ λz [John $[_\alpha$ read z $]$ $]$

(20)   ⤳ [the est$_C$ λd [d-many ~~tokens of her$_z$ color~~]]

      [[λx Mary$_\mathbf{F}$ λz z collect [x [tokens of her$_z$ color]]] $\sim C$]

$$\left\{ \begin{array}{l} \lambda gx : (\text{toks of M's color})\,x.\ \text{M collect } x, \\ \lambda gx : (\text{toks of J's color})\,x.\ \text{J collect } x, \\ \lambda gx : (\text{toks of S's color})\,x.\ \text{S collect } x, \\ \qquad\qquad\vdots \end{array} \right\}$$

Unfortunately, this sort of reconstruction will not help derive sloppy readings for pronouns in the adjectival complement of the superlative. This is because, of necessity, only the non-adjectival part of the superlative NP is interpreted in its surface position; the degree-taking adjective can't reconstruct because it would unbind the degree the superlative quantifies over. For instance, (21b) presents the LF of sentence (21a) that corresponds to the reconstruction derivation in (20). No matter where the adjective is interpreted, one of its two arguments — the degree or the PP — will contain an unbound variable.

(21)   JOHN climbed the mountain closest to his house.   [rep. (10)]

    a. ✓ John climbed a mountain that was closer to his house than any mountain climbed by anyone else was to their house

    b.   ⤳ [the est λd [mntn d-close to his$_z$ house]]

        [[λx John$_\mathbf{F}$ λz z climb [x [mntn d-close to his$_z$ house]]] $\sim C$]

Related to this, reconstructing any noun phrase out from underneath a non-intersective adjective will lead to bizarre meanings. This is because privative adjectives like those in (22a) and modal adjectives like those in (22b) cannot be interpreted predicatively; they only make sense as intensional property modifiers. For instance, (22b) says that there is a degree to which John presented a d-likely proof of John's claim that exceeds any d' to which someone else presented a d'-likely proof of their claim. In other words, the strategy that John presented is most likely to constitute an actual proof. But reconstructing the nominal property and waiting for its effect to boomerang back around through the implicit comparison class variable will produce the unattested truth conditions requiring John's strategy to be both a proof and a d-likely object, for some d greater than any d' such that somebody else's strategy is both a proof and a d'-likely object.

(22)   a. JOHN's bot produced the most {realistic, believable, convincing} sample of his writing.

    b. Of the three of them, I'd say JOHN presented the most {likely, promising} proof of his claim.

See Bumford 2017b for a few additional reasons to be worried about this sort of partial nominal reconstruction, even in cases where it appears to deliver the correct truth conditions.

6 Domain restriction without constraints

All of the issues for restrictionist theories so far have stemmed from the assumption that relative superlatives are genuinely focus-sensitive. It is this assumption that leads to the scope paradoxes demonstrated above: the superlative quantifier needs to take wider scope than the focus phrase it associates with in order to non-recursively quantify over the contextual alternatives, but the superlative's complement needs to take narrower scope than the focus phrase in order for bound pronouns to vary across alternatives sloppily.

If, however, the connection between the superlative's domain and focus were somewhat looser, or less conventionalized, then this could open the door to an in-situ derivation for the superlative description, where any pronouns could be bound by the subject. So does allowing the comparison class to vary freely — abstracting away from the particular mechanics of focus-sensitivity — salvage a restrictionist approach to relativity?

Ostensibly, the best possible candidate for a sloppy C attached to a DP-internal 'est' is the one that reconstruction generated in (20), leading to the correct truth conditions. So for 'Mary collected the most$_C$ tokens of her color', we let C be the set of token-sums each of which is of the right color for the player who collected it (e.g., the set of Mary's red token-sums, John's blue token-sums, etc., where Mary is playing red, John blue, etc.). This is clearly the set of token collections that are actually up for comparison in the sloppy reading. All that would need to be done to deliver the relevant truth conditions would be for the superlative description to pick out the largest such sum; the sentence would then assert that Mary collected it. However, this is not what happens. The superlative's measure in (23) is not just $[\![\lambda d\ [d\text{-many}]]\!]$, but $[\![\lambda d\ [d\text{-many of her color}]]\!]$. And since 'her' is bound to 'Mary', that means each player's collection is being measured not by how many tokens it contains, but by how many *red* tokens it contains (again assuming Mary plays red). But by hypothesis, the only red tokens in C are the ones collected by Mary, so the sentence then is predicted to entail merely that the largest collection of tokens that Mary collected was in fact collected by Mary. This is effectively a tautology, and certainly not the sloppy reading.

(23)   Mary$_\mathbf{F}$ λz z collect [the est$_C$ λd [d-many $\cdots$ her$_z$ $\cdots$]]

$$\left\{ \begin{array}{l} \lambda gx\colon (\text{toks of M's color})\,x.\ \text{M collect } x, \\ \lambda gx\colon (\text{toks of J's color})\,x.\ \text{J collect } x, \\ \lambda gx\colon (\text{toks of S's color})\,x.\ \text{S collect } x, \\ \qquad\qquad\qquad \vdots \end{array} \right\}$$

The reason that this C works in the reconstruction derivation, but fails here, is that in (20) the nominal content of the description not only sinks back to a position where the pronoun is bound, eventually creating the appropriate comparison class, it also disappears from the superlative's measure, leaving only $[\![\lambda d\ [d\text{-many}]]\!]$, as desired. But if C is arrived at pragmatically, then the nominal content still has to be interpreted, and inevitably ends up denoting a measure in which the pronoun is strict. If, for some reason, C were as in (23) and the nominal content of the description were simply *ignored*, then the truth conditions would be correct.[5] But this would be effectively non-compositional. After all, there are no readings of superlative descriptions, relative or otherwise, in which the potential witnesses for the description do not satisfy the property picked out by the noun phrase; no readings of (20), for instance, in which we are not comparing tokens. Heim (1999), in fact, suggested that every potential witness of a superlative description was *presupposed* to have the property designated by its NP (see also Herdan & Sharvit 2006 for further argument in this direction).

Alternatively, the sloppy description's NP could be bracketed out of its measure: [[est$_C$ many] [tokens of her$_m$ color]]. Recall that C, by assumption, already includes exactly the right objects for comparison — appropriately-colored collected tokens — and 'many' is exactly the right metric to use to get the sloppy truth conditions. When the superlative takes these two ingredients as arguments, the result is a property of any appropriately-colored token-sum that is bigger than any other. This property is then in principle free to combine intersectively with the property denoted by the NP, essentially 'red token'. But that combination would be *nonrestrictive*, because the superlative property is already at most a singleton (and in the context of a definite description, it will ultimately be presupposed to be non-empty, so it really *is* a singleton). Setting aside some questions about what exactly is presupposed to exist and what is asserted, the truth conditions of such a derivation are correct, but the derivation itself is dubious. Outside of exactly these sloppy configurations, there are no nonrestrictive readings of superlatives. For instance, (24) absolutely cannot

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5 However, as far as I can tell, even such a liberal restrictionist theory would continue to undergenerate sloppy readings for pronouns in the superlative's adjective phrase, as in (21).

be interpreted as saying that John picked out the biggest thing in the closet, which happened to be a chair.

(24)   Of all the things in the closet, John picked out the biggest chair.

    a. [#]John picked [the [[est$_{\text{closet-thing}}$ big] [chair]]]

For similar reasons, no amount of Skolemizing or parameterizing the comparison class, as in, e.g., von Fintel 1994, will help. It isn't the comparison class at all that causes headaches for restrictionist theories; it's the measure! In configurations like (23), it is the overt gradable nuclear scope of the superlative morpheme that contains the offending pronoun. And this pronoun is going to refer stubbornly to the overt correlate unless the superlative scopes over some constituent in which the pronoun's binder varies (as in the scopal focus-sensitive derivations), or unless the superlative quantifies over that pronoun itself.

So this finally is the only way out I can see for restrictionist theories. The pronoun in (13b) that appears to be bound by the subject, 'Mary', must actually be bound by the superlative itself. This converts the gradable property denoted by the description into a gradable relation, effectively neutralizing the strictness of the pronoun by brute force.

With this assumption in place, there are several technical choices regarding denotations, the comparison class, and constituency that will all deliver sloppy truth conditions. One combination is given by the derivation in (25). The key is that in the scope of the superlative morpheme, the pronoun is abstracted over, creating a relation of type $d \to e \to e \to t$.[6] In addition, the domain variable C is replaced by what Farkas & Kiss (2000) call a "frame of comparison" (see also Coppock & Beaver 2014), the relation one would obtain by abstracting over both the superlative description and the superlative's correlate. In this case that leaves just the denotation of the verb: $[\![C]\!] = [\![\text{collect}]\!]$.[7] The superlative phrase then denotes the property had by any collector-matching sum of collected tokens for which there is a degree that distinguishes it from all other collector-matching token-sums in quantity. The sentence entails that Mary collected that thing.

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6 The scopeless abstraction here is certainly mysterious, but the important thing is just that the superlative comes to bind the pronoun. Other options for accomplishing this include assignment-intensional function application (Bumford 2017b) and identity-denoting pronouns together with composition/continuation-passing combination up to the superlative (Jacobson 1999; Barker & Shan 2014).

7 In principle, one could think of this two-place comparison relation as a Skolemized comparison class, mapping individuals to the domain of items that they collected. But unlike von Fintel's (1994) parameterized domain restrictors, the Skolem variable would either have no syntactic projection, or would also have to be bound by the superlative morpheme.

(25) a. $[\![\text{est}]\!] := \lambda C G x . \exists d . \{x\} = \{v \mid \exists z . C v z \wedge G d z v\}$
   b. Mary collect [the [est_C λd λz [d-many tokens of her$_z$ color]]]

The same strategy will work just as well for the adjectival cases presented above. But what kind of strategy is this? Is it really feasible that the pronoun in the description is bound by the superlative rather than the correlate? For one thing, that would make the pronoun's phi-feature agreement with 'Mary' tricky to explain. That is, if 'her' neither refers to Mary nor is bound by the subject, then why is (26) deviant? Relatedly, why would a sloppy pronoun in a superlative description respect normal Binding Theoretic principles, as seen in (27), if it were not in fact bound by the subject?

(26) *Mary collected the most tokens of their color.

(27) a. Mary took the best picture of herself.
    (Mary's self-portrait was better than anyone else's self-portrait)
   b. *Mary took the best picture of her.

For another thing, if this were the right analysis of sloppy readings, it would mean that the superlative morpheme is actually ambiguous between arbitrarily-many distinct denotations: a traditional definition in the spirit of Heim 1999 that covers absolute, pronoun-free relative, and strict relative descriptions, and then another family of entries like (25a) that are prepared to existentially quantify over as many "sloppy" pronouns as happen to get abstracted over.

These questions deserve elaboration, but at this point I think it safe to conclude that if there is a justifiable mechanism by which a DP-internal superlative can generate sloppy readings, it is *not* simply a matter of pragmatic or contextual domain restriction.

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