Reflexives and Pronominals in Ambiguous English Sentences

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1 Introduction

The seed for this paper took root when my professor for Cognitive Science cited, as evidence

for the existence of a Universal Grammar (UG), the poverty of the stimulus surrounding

pronoun references.[*] He pointed out that children as young as three years old will use

pronominals and reflexives correctly, never making mistakes of the sort we would expect if

coreferentiality were a learned rather than an innate part of UG. On the other hand, when my

syntax class looked at more complex, less straightforward sentences, it became apparent that

even adults are sometimes in disagreement over the proper choice. Can this confusion be

explained in syntactic terms, shoring up the link to UG? Alternatively, does a syntactic

analysis fail, leaving us with semantic considerations and a weaker case for UG?

1.1 Overview of paper

In order to understand why we must adapt our rules and how we might go about doing so, first

we must thoroughly understand the rules we already have. Section 2.1 present the data that fit

the traditional government and binding model. Sections 2.3 and 2.4 establish the theoretical

bases that are relevant to this paper, including government, case and binding rules. Section 3

explains how these rules account for sentences where the dichotomy between pronominals

and reflexives is clear, then presents a set of data that is problematic for this analysis. Next,

section 4 presents an attempt to account for the new data by modifying the grammar presented

in sections 2 and 3. However, the necessary modifications would have far-reaching

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consequences for the whole syntactic theory of government and binding on a scale that does not seem to be warranted by the problem data. Section 5 explores a potential solution in Optimality Theory by integrating semantic constraints with syntactic ones. Combined with discourse constraints, integrated Optimality Theory promises to be capable of accounting for these data and other as well.

2 Preliminary observations about government and binding theory

Before delving into analysis and discussion of the data, it is appropriate to clarify the background assumptions with regard to syntactic theory in order to preclude any misunderstandings. The general theoretical perspective is that of government and binding theory. A working knowledge of the general tenets of Phrase Structure Rules, the lexicon, and tree structures is assumed.

2.1 Pronouns

A pronoun is a form that can be used to refer back to a noun without renaming the noun. English has four masculine pronouns: *he*, *him*, *his* and *himself*. *He*, *him* and *his* are pronominals in the nominative, accusative and genitive cases, respectively; *himself* is a reflexive anaphor. The standard assumption in Binding Theory is that anaphors[1] and pronominals occur in mutually exclusive syntactic positions. Compiling a set of sentences whose data support this assumption poses no difficulty; the sentences in (1)-(4) are just a few examples.

1a. John$_i$ enjoyed himself$_i$ at the party.
1b. *John$_i$ enjoyed him$_i$ at the party.

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[1] Reflexives (*himself*) and reciprocals (*each other*) are the two types of anaphors, but only reflexives are considered in this paper.

2a. John$_i$ left a note for himself$_i$.
2b. *John$_i$ left a note for him$_i$.
3a. *John$_i$ thought that Sally disliked himself$_i$.
3b. John$_i$ thought that Sally disliked him$_i$.
4a. *John$_i$ believed that himself$_i$ would succeed.
4b. John$_i$ believed that he$_i$ would succeed.

By examining sentences like these, we can create some fairly simple syntactic rules that will

handle most sentences with pronouns. This work has already been done, as will be seen in

2.2-2.3. Then, we can examine the implications these rules have on sentences about whose

grammar speakers are uncertain, such as those shown in (5-7) below.

5a. ?Sally talked to John$_i$ about himself$_i$.
5b. ?Sally talked to John$_i$ about him$_i$.
6a. ?Sally talked to John$_i$ about himself$_i$ and his$_i$ family.
6b. ?Sally talked to John$_i$ about him$_i$ and his$_i$ family.
7a. ?Sally talked to John$_i$ about himself$_i$ and his work ethic.
7b. ?Sally talked to John$_i$ about him$_i$ and his work ethic.

2.2 Government and Case

Government is a type of relationship between two syntactic entities where one is the *governor*

and the other receives government. The presentation given here is based on Chomsky's

Barriers (1986), which gives a very thorough treatment of the topic. Government is linked to

case because a noun phrase (NP) gets its case from its governor. A head 'A' governs a head

'B' if and only if three conditions are all satisfied. Government has two subdivisions, *head

government* and *antecedent government*, but these two kinds of government differ only in

their first conditions. Finally, the *governing category* for a noun phrase is the minimal

inflectional phrase that contains both the noun phrase and its governor. The rules

are summarized in (8-9)

8. <u>Government</u>
A governs B iff
i. A is N, V, A, P, I$_{+fin}$, C$_{for}$ (Head Government)
        or

A and B are coindexed (Antecedent Government)
ii. Every XP that dominates A also dominates B, and A does not dominate B
iii. Every XP other than IP that dominates B also dominates A

9. <u>Governing Category</u> (GC)
   The governing category for an NP 'B' is the minimal IP containing B and B's governor

An NP gets its mandatory case from its governor; each head can assign at most one case to

either its sister or its specifier.

10. <u>Case Assignment</u>
   A. An NP gets case from its governor
   B. A head assigns at most one case within its maximal projection
      I_{+fin} assigns nominative case
      N assigns genitive case
      V, P and C_{for} assign accusative case

11. <u>Case Filter</u>
An NP must be casemarked at s-structure, but traces can fulfill this requirement

C-commandment is similar to government, but applies to all nodes instead of just maximal

projections, and stipulates that neither of the nodes may dominate the other.

12. <u>C-command</u>
A c-commands B iff
i. Every node that dominates A also dominates B
ii. A does not dominate B
iii. B does not dominate A

2.3 Binding and NPs

An NP can *bind* another NP that is referentially dependent on it if the conditions in (13) are satisfied.

13. <u>Binding</u>
NP 'A' binds NP 'B' iff:
i. A and B are coindexed
ii. A c-commands B

Noun phrases can be divided into two subgroups, *pronouns* and *r-expressions*. *R-expression* is short for referential expression and includes names and objects (such as *Mary* or *the chair)*. *Pronouns* can be further divided into *reflexive* pronouns (in English, those ending in *-self*, e.g. *myself*) and pronominals (*he*, *him*). (7) shows the subdivisions that compose the NP category.

```
    14.              NPs
                 /        \
         pronouns        r-expressions
         /      \
  reflexives        pronominals
```
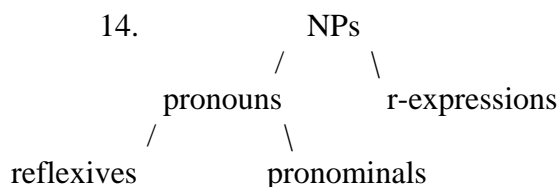
As we might expect, these subcategories behave differently syntactically. The standard, Government-Binding analysis is that a reflexive must be bound in its governing category, whereas a pronominal cannot be bound in its GC, and an r-expression simply cannot be bound at all. *Binding Conditions* specify these conditions for the binding of a subcategory of NPs.

15. <u>Binding Conditions</u>
A. A reflexive must be bound in its GC
B. A pronoun cannot be bound in its GC
C. An R-expression cannot be bound

These rules capture the essence of the current theories relevant to the topic of this paper. They are referred to collectively as our current grammar. Our current grammar is straightforward and useful, but it does not account for our full range of data, as we shall see in section 3.

3 Application/Illustration of the rules

Now that we've established a base of rules for selecting reflexives and pronominals, we can test them by applying them to our data. As previously stated, we will find that the rules in section 2.3-2.4 correctly predict the grammaticality of (1-4) but stumble over (5-7).

3.1 Reflexives that fit

Recall from section 2.1 the very first pair of sentences we considered, reprinted here for

convenience:

1a. John$_i$ enjoyed himself$_i$ at the party.
1b. *John$_i$ enjoyed him$_i$ at the party.

(1a) has the tree structure shown in (16).

16.

```
                    CP
                    |
                    C'
                   /  \
                 C_-q   IP
                      /   \
                    NP      I'
                    John   /  \
                          I    VP
                               / | \
                              V  NP   PP
                         enjoyed himself_i |
                                 *him_i    P'
                                          /  \
                                         P    NP
                                         at   /  \
                                             D    N'
                                            the   |
                                                  N
                                                 party
```
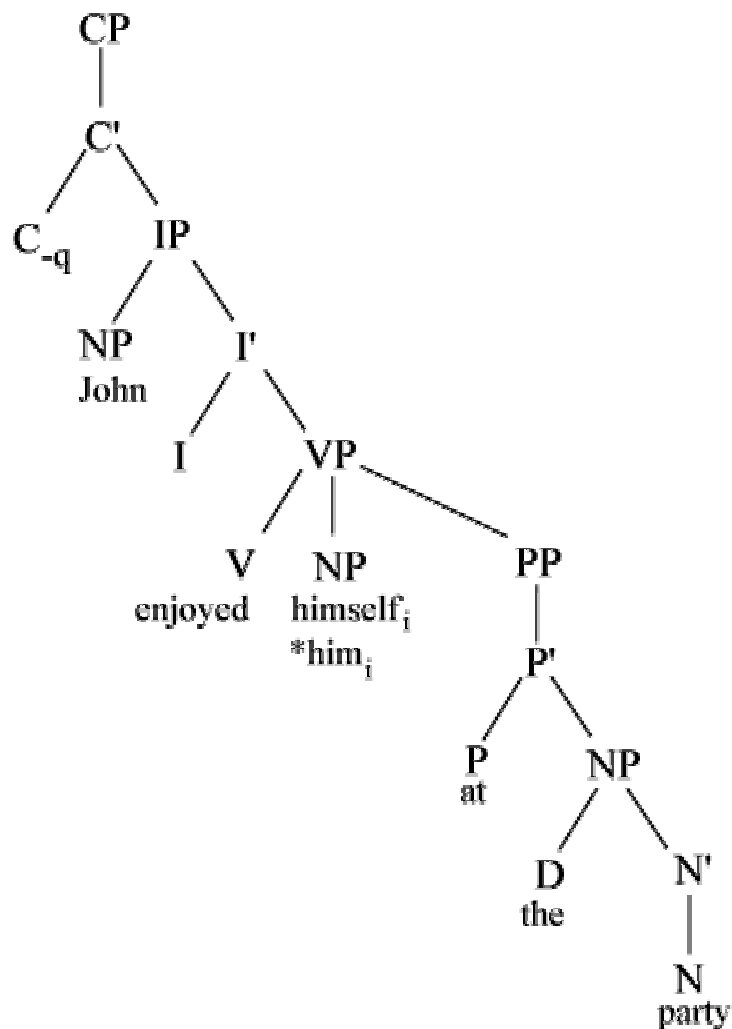
In (16), we could label *John* as *A* and *himself* as *B* and then apply the rules set forth in section

2. By doing so, we can easily see that our current grammar accurately predicts (1a) to be

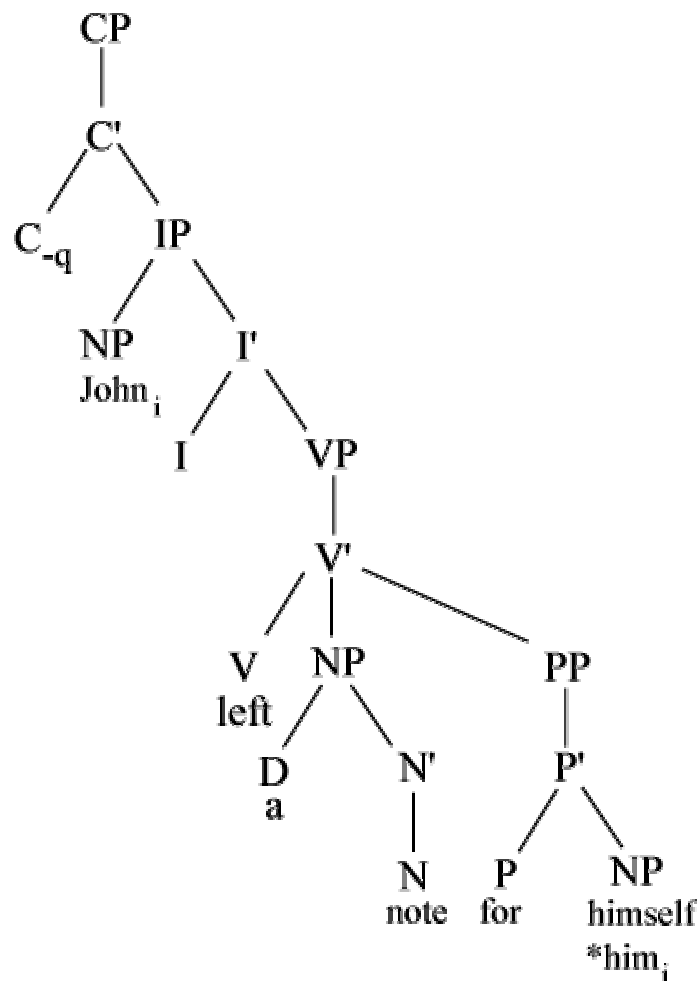grammatical. *Himself* is coindexed with *John* (which is made explicit in our examples by the sharing of subscript letters). Recall that the GC of *himself* is the minimal IP containing *himself* and the governor of *himself*. (16) has only one IP, so the GC of *himself* must by default include the entire sentence (except for the maximal CP, the C of which is empty). Moreover, every node that dominates *John* also dominates *himself*, yet neither *himself* nor *John* dominates the other. Therefore, *John* c-commands *himself*. Since *John* both is coindexed with and c-commands *himself*, *John* binds *himself*. Now all that remains to be satisfied is the Binding Condition that *himself*, as a reflexive, must be bound in its GC. Since the GC for *himself* is the entire sentence, *John* is in the sentence and *John* binds *himself*, our current grammar correctly predicts (1a) to be grammatical.

By the same token, (1b) is correctly predicted to be ungrammatical. Except for the replacement of *himself* with *him*, the tree for (1b) would be precisely the same as the tree shown in (16), as noted in (16). *Him* in (1b) is coindexed with and c-commanded by *John* just as *himself* is in (1a), and so by the same logic *him* in (1b) is bound within its GC by *John* just as *himself* is in (1a). Since *him*, a pronominal, cannot be bound within its GC, our current grammar correctly predicts (1b) to be ungrammatical.

The same sort of analysis can be applied to (2a-b), repeated here for convenience, with the tree for (2a) shown in (17).

2a. John$_i$ left a note for himself$_i$.
2b. *John$_i$ left a note for him$_i$.

17.

```
                    CP
                    |
                    C'
                   / \
              C        IP
               -q     / \
                 NP        I'
                 John     / \
                     i   /   \
                        I     VP
                              |
                              V'
                             /|\
                            / | \
                           V  NP   PP
                          left /\   |
                             /    \ P'
                            D     N' / \
                            a     |  P   NP
                                  N  for himself
                                note    *him
                                            i
```

John and *himself* are coindexed, and *John* c-commands *himself*, so *John* binds *himself*. (17)

also has only one IP, so the GC for *himself* again includes all of the words in the sentence.

John is in the sentence and binds *himself*, so *himself* is bound within its GC and as a reflexive

is correctly predicted grammatical. Just as the analysis of (1a) could be extended to show that

our current grammar correctly predicts (1b) as ungrammatical, so can the analysis of (2a) be

extended to show that (2b) is correctly predicted ungrammatical since the pronominal *him*
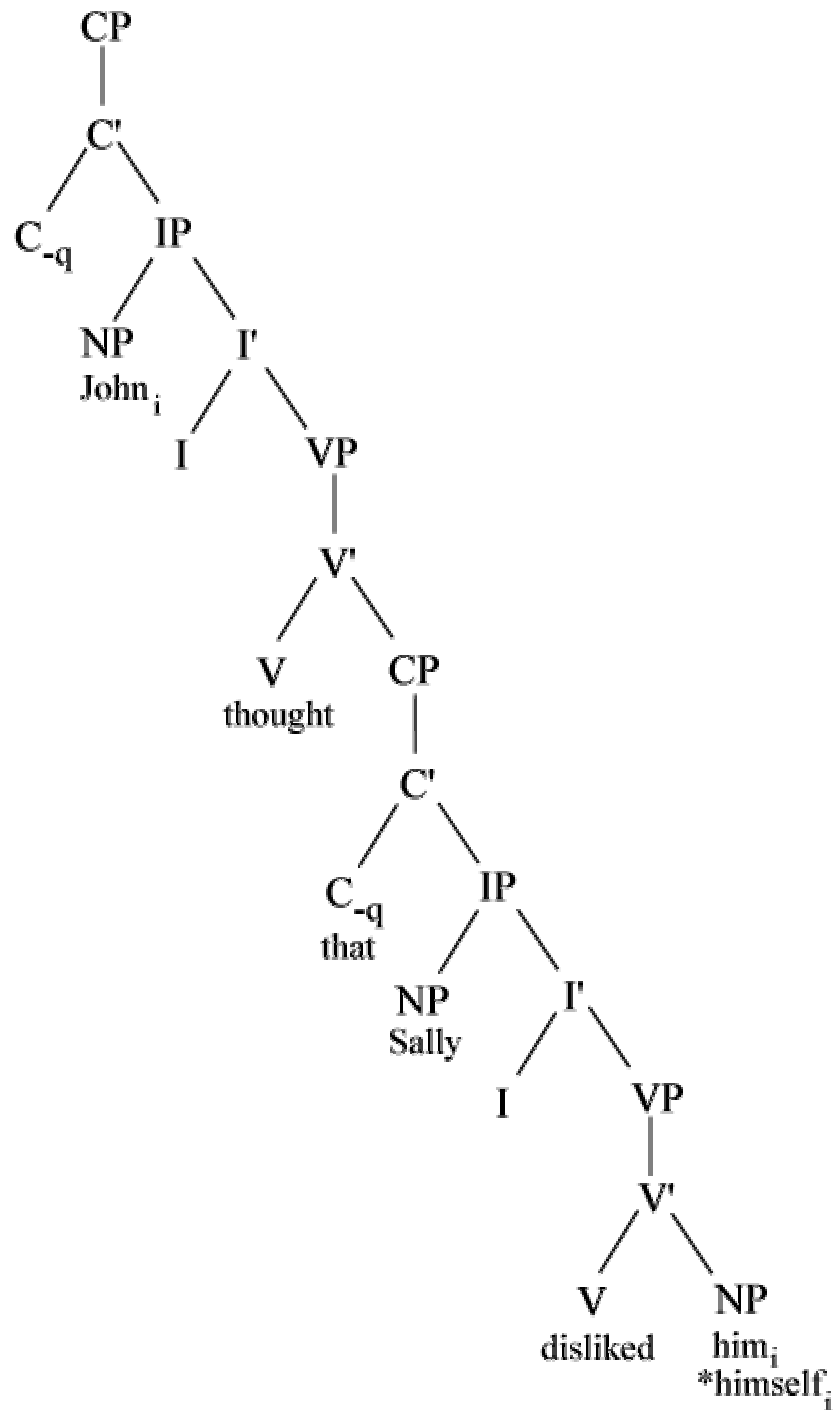
cannot be bound within its GC.

3.2 Pronominals that fit

In the same way that syntactic positions predicted to be grammatical for reflexives are

ungrammatical for pronominals, positions grammatical for pronominals are ungrammatical

for reflexives. The set of sentences in (3a-b) illustrates this flip side of the reflexive-

pronominal relationship.

3a. *John$_i$ thought that Sally disliked himself$_i$.
3b. John$_i$ thought that Sally disliked him$_i$.

18.

```
                    CP
                    |
                    C'
                   /  \
                 C     IP
                  -q  /  \
                    NP     I'
                    John  /  \
                       i I    VP
                              |
                              V'
                             /  \
                            V     CP
                         thought  |
                                  C'
                                 /  \
                               C     IP
                                -q  /  \
                               that NP    I'
                                    Sally /  \
                                         I    VP
                                              |
                                              V'
                                             /  \
                                            V    NP
                                        disliked him
                                                   i
                                               *himself
                                                       i
```

(18) shows the structure of (3a), which our current grammar correctly predicts as

ungrammatical. Every node that dominates *John* also dominates *himself*, and neither directly

dominates the other, so *John* c-commands *himself*. Furthermore, *John* and *himself* are

coindexed, so *John* binds *himself*. However, unlike (16) and (17), (18) has two IPs. *Himself* is governed by the verb *disliked*; the minimal IP containing *himself* and *disliked* is the lower IP, and *John* is in the higher IP. Therefore, although *John* binds *himself*, *himself* is not bound within its GC and is consequently predicted ungrammatical. For the same reasons, the pronominal *him* in (3b) is predicted grammatical.

(4a-b) can be treated very similarly to (3a-b). The only difference here is that the position we are concerned with is that of the specifier of the lower IP rather than the sister to a verb or a preposition. As a result, the pronominal receives the nominative rather than the accusative case and is accordingly realized as *he* instead of *him*. The relevant qualification remains the same: *John* is not in the GC of *himself*, so the reflexive is ungrammatical while the pronominal is grammatical.

4a. *John$_i$ believed that himself$_i$ would succeed.
4b. John$_i$ believed that he$_i$ would succeed.

19.

```
                    CP
                    |
                    C'
                   /  \
                C-q    IP
                      /  \
                    NP    I'
                  John_i / \
                        I   VP
                            |
                            V'
                           /  \
                          V    CP
                      believed |
                               C'
                              /  \
                           C-q    IP
                          that   /  \
                               NP    I'
                              he_i  /  \
                            *himself_i \
                                    I   VP
                                        |
                                        V'
                                       /  \
                                      V    VP
                                   would   |
                                           V'
                                           |
                                           V
                                        succeed
```

So far, grammar set forth in sections 2.3-2.4 seems to be doing well. It has correctly selected the grammatical category of pronouns in each of four pairs of sentences while excluding ungrammatical choices. The strengths of such clear-cut rules should be kept in mind as we turn our investigation to data that are not so kind to our current grammar.

4 Problem data and ways the grammer might cope

In the traditional syntactic analysis, the choice between reflexives and pronominals is either-or[2]. That is, reflexives and pronominals occur in complementary distribution, and in a given syntactic position, only one or the other is the grammatical choice. Native speakers of English, however, are often unsure which selection is grammatical when confronted with certain types of sentence constructions. In order to obtain a source of objectivity, I surveyed some of my fellow Swarthmore students. I wrote up a survey (see Appendix A) and sent it out to 80 friends. 50 people emailed me back within two days; their results are presented in Appendix B.

4.1 Problem data set

For the sentences presented in my survey, the 'right' choice was not always so clear, as shown by the variability among the responses of the native speakers. Consider sentences (5-7):

5a. ?Sally talked to John$_i$ about himself$_i$.
5b. ?Sally talked to John$_i$ about him$_i$.
6a. ?Sally talked to John$_i$ about himself$_i$ and his$_i$ family.
6b. ?Sally talked to John$_i$ about him$_i$ and his$_i$ family.
7a. ?Sally talked to John$_i$ about himself$_i$ and his work ethic.
7b. ?Sally talked to John$_i$ about him$_i$ and his work ethic.

---

[2] For a discussion of other types of problematic sentences, such as picture nouns like (i), see Wilkins (1988).
i. Ben$_i$ found a picture himself$_i$.

As explained in 2.2-2.3 above, traditional generative syntactic rules can handle sentences like (1-4). However, in (5-7) our rules no longer seem to hold. Moreover, it seems that the syntactic positions where reflexives and pronominals can appear are not mutually exclusive, after all. Section 4.2 attempts to revise the rules in order to account for sentences like (5-7) while maintaining the government and binding (generative?) perspective.

4.2 Potential applications of the grammar to the problem data

Consider (5a-b):

5a. ?Sally talked to John$_i$ about himself$_i$.
5b. ?Sally talked to John$_i$ about him$_i$.

The grammaticality of both these sentences seems to be in doubt, based on the disagreement among those I informally surveyed (see Appendix B), all of whom are well-educated American English speakers. Yet our grammar does not predict such indecisiveness; rather, it decisively rules (5a) ungrammatical and (5b) grammatical.

20.
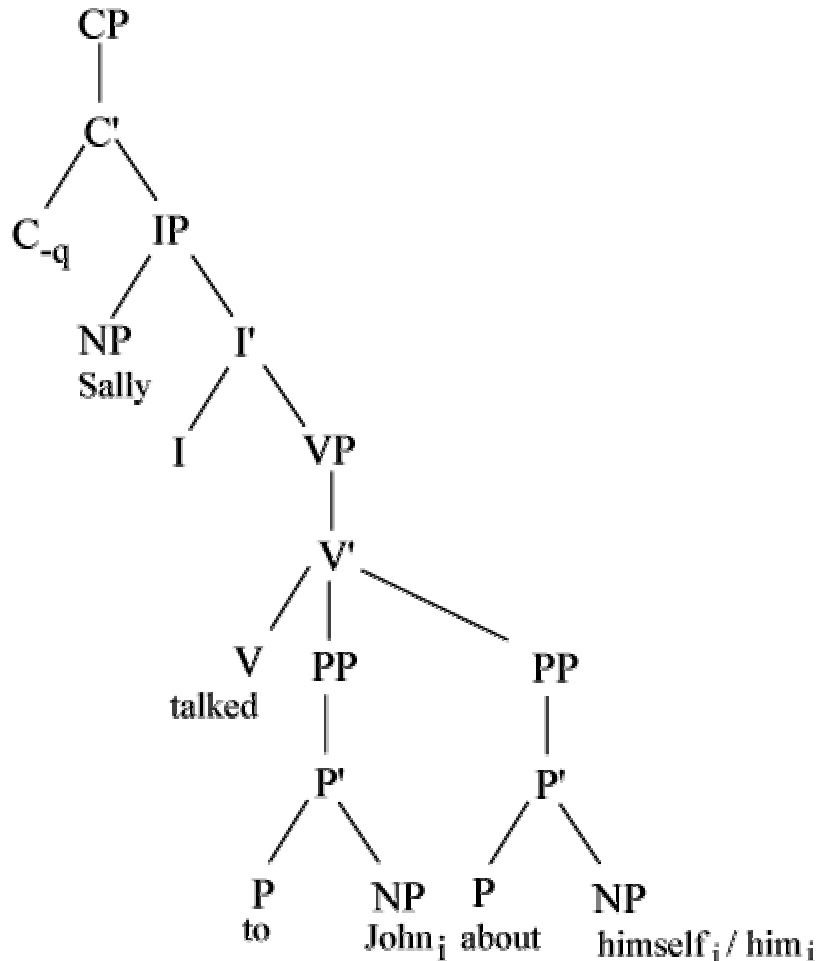
The tree shown in (20) shows why: although they are coindexed, *John* does not c-command

him in (5b), and hence does not bind *him*. Since a pronominal cannot be bound within its GC,

him is grammatical. According to the same rules, *himself* in (5a) is not bound. A reflexive

must be bound within its GC, so *himself* is ungrammatical according to our current grammar.

The majority of the people surveyed, on the other hand, chose (5a) over (5b), just the

opposite of what the current grammar predicts. Similarly surprising data surface for other

sentences. Recall (6a-b):

6a. ?Sally talked to John$_i$ about himself$_i$ and his$_i$ family.
6b. ?Sally talked to John$_i$ about him$_i$ and his$_i$ family.

Although (6a-b) hardly seem different from (5a-b), a majority of those surveyed (64%)

changed their selection from one to the other. That is, they either chose (5a) and then (6b) or

else they selected (5b) and (6a). What could have caused this change in judgment? First, let

us compare the tree in (20) to the one for (6b) in (21).

21.
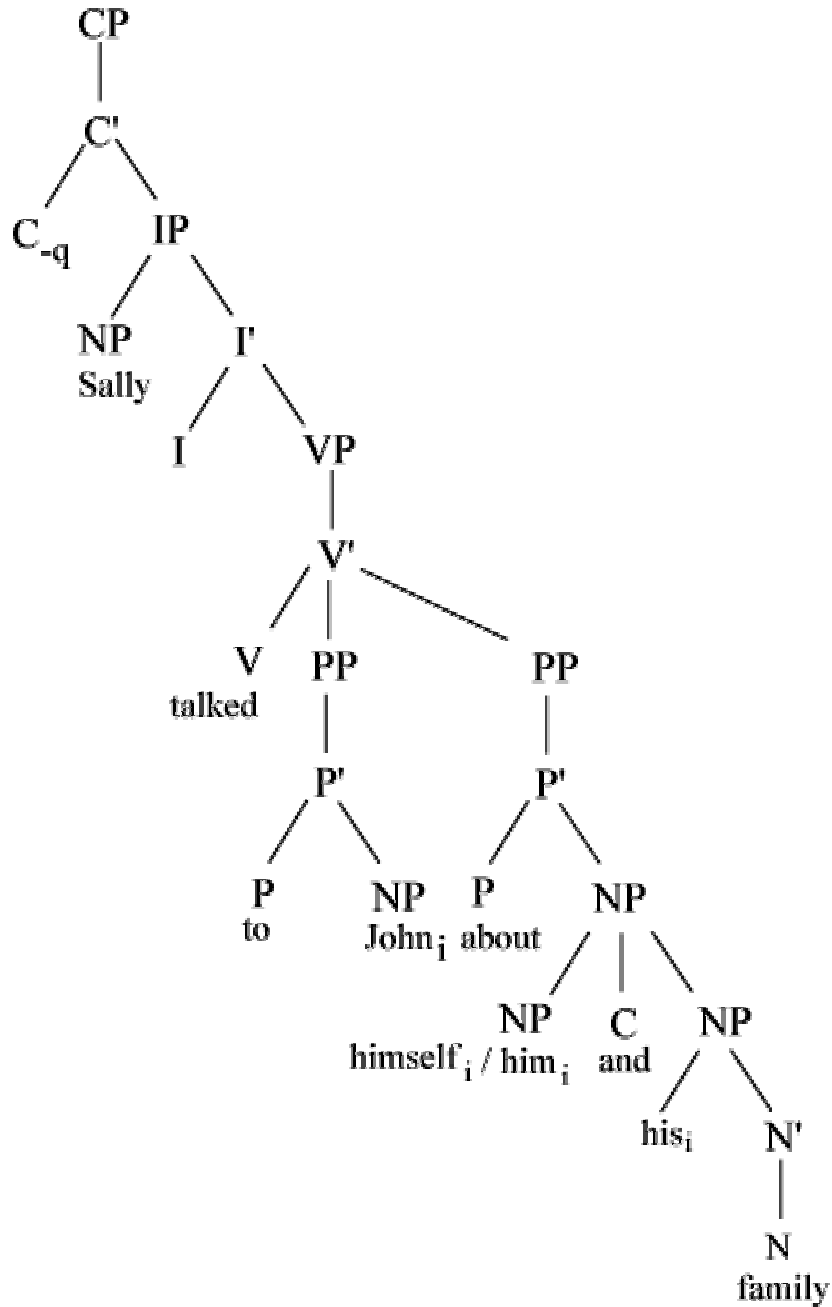
As expected, only one small difference separates (20) from (21). In (5a-b), the NP sister to the preposition *about* is a single NP(*him(self)*), while in (6a-b) the NP has two NP daughters joined by a conjunction (*him(self) and his family*). Although it seems counterintuitive, perhaps this small difference is somehow enough to warrant the syntactic distinction if we contort our rules or modify our tree structures. Before we go to such lengths, we must not forget our final pair of sentences.

7a. ?Sally talked to John$_i$ about himself$_i$ and his work ethic.
7b. ?Sally talked to John$_i$ about him$_i$ and his work ethic.

22.
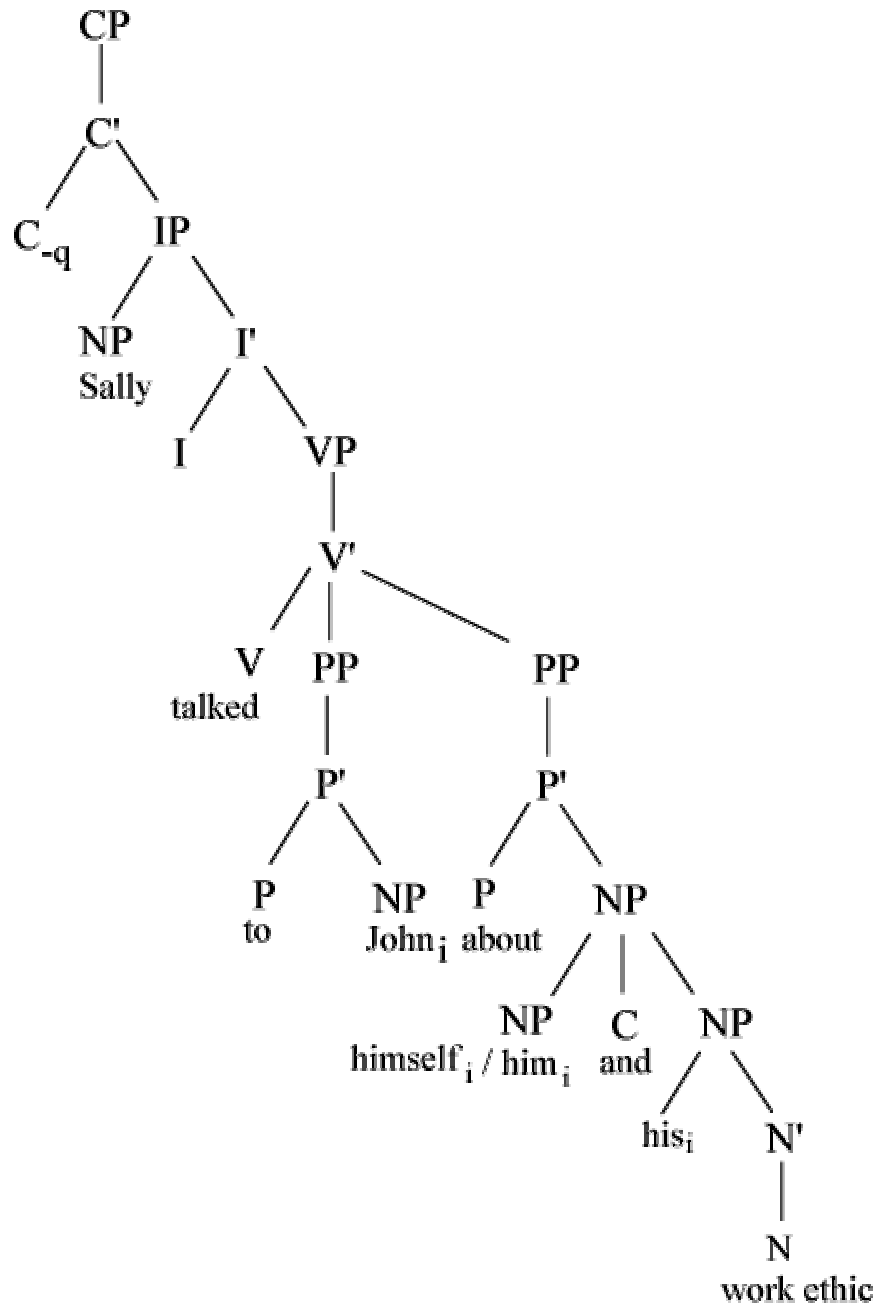
As in (6a-b), in (7a-b) the sister to the preposition *about* has two NP daughters joined by a

conjunction. Even if the selection varies between speakers, we would expect each speaker to

make the same choice for (7) as for (6). The majority of speakers surveyed did indeed choose

the same values for sentences like (6) and (7), yet nearly one-third (30%) did not. Even if we

can find a syntactic reason for the difference between (5) and (6), (6) and (7) seem likely to

pose an even greater problem for a syntactic account of the data.

4 Alternative analyses

Our ultimate conclusion may be that syntax provides no account for this phenomenon.

Nevertheless, this possibility should not deter us from pursuing it; all is not lost. Should it be

the case that a syntactic analysis is not possible, we still will need to modify our grammar to

allow semantics to play a role in the selection of a reflexive or pronominal. Moreover, even

reaching one of the limits of syntactic analysis informs provides valuable insight into how

syntax and semantics interact to produce grammatical sentences. Keeping recourse to

semantics open, we are now in a position to see how far a syntactic analysis can take us.

4.1 An attempt at syntactic revision

Syntactically, speakers' majority preference for (5a) over (5b) poses the greatest threat to our

current grammar, because that is precisely the opposite of what it predicts. We could try to

force *John* into c-commanding *himself* by redrawing the tree in (20) to look like (23).

23.

```
                    CP
                    |
                    C'
                   /  \
                C-q    IP
                      /  \
                    NP    I'
                   Sally /  \
                        I    VP
                             |
                             V'
                            /  \
                           V    PP
                        talked  |
                                P'
                               /  \
                              P    NP
                             to   /  \
                                NP    PP
                              Johni   |
                                      P'
                                     /  \
                                    P    himselfi / himi
                                  about
```

But as tempting as that may be, it doesn't really make sense. Consider the partial

subcategorization frame for *talk* shown in (24).

24. talk   V   [____(PP)(PP)]
                               \   \
                         < 1   2   3 >

Talk has three θ-roles to assign: the talker, the person talked to, and the topic of conversation.

Adjoining the second PP to *John* prevents *talk* from properly assigning the 'topic of

conversation' θ-role to *about himself*, which it should clearly receive. Alternatively, we could

discount *to* and its projections by claiming it is merely a case marker[3], but that would cause

problems for (6-7), where we want the opposite result. Our attempts go get *John* to c-

command *himself* fail unless we resort to measures that seem drastic and merely serve to shift

the problem with our grammar elsewhere.

Since we can't change the sentence to fit the rules, the only alternative is to change the

rules to fit the sentence. Unfortunately, as illustrated by (1-4), the rules work quite well for

rather a lot of sentences, so we must be careful that the ripple effects of any changes do not

disrupt this good accounting. Given that the rules' main fault seems to be one of making

sharp distinctions where people see fuzziness, softening the edge seems like the right

approach. Our first inclination might be to revise (15) to look like (25).

> 25. <u>Binding Conditions</u>
> A. A reflexive must ordinarily be bound in its GC
> B. A pronoun cannot ordinarily be bound in its GC
> C. An r-expression cannot ordinarily be bound

Now we have a definition vague enough to depend on an individual's interpretation of

'ordinarily,' which accounts for the variation in responses to sentences (5-7). Unfortunately,

the rule is now too vague to be of much use. Unless, that is, we define what precisely counts

as an 'extraordinary' case where the clean rule does not apply. Aiming to keep our rule as

syntax-based as possible, we posit (26):

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[3] It has been claimed for similar constructions, in sentences such as (i), that a semantically null preposition 'of' is required as a Case marker. It assigns Case to an NP that would otherwise be Caseless.
   i. John's proof of the theory. (Chomsky, 1995, p.113)

26. <u>Extraordinary Binding Conditions</u>
An instance of binding is extraordinary if the NP in question is conjoined with some other NP.

This construction is admittedly awkward, but nonetheless it seems to work for all of our data (except (5)), which was the motivation for changing the rule in the first place. If we continue to follow this line of thought to its logical next step, we will be able to shift away from such arbitrary and unintuitive attempts and find a more sensible approach. With that thought in mind, let us try to decide what to do with 'extraordinary cases' once they are identified.

4.2 Semantic Binding Theory

Although it is not the dominant view, it has been argued that "issues of binding are issues of interpretation" and, consequently, that Binding Theory is "based on semantic notions" (Napoli, 1993, p. 521). According to this view, syntactic constructions like governing categories are replaced with semantic constructions like Complete Functional Complexes.

27. <u>Complete Functional Complex (CFC)</u>
A CFC is comprised of a theta-assigner and all its arguments

A semantic framework like this fits nicely with the concerns about ambiguity and interpretation that many people volunteered as motivating their selections about grammaticality (see Appendix 2).

Is there a way to take advantage of these "semantic notions" without recasting the whole Binding Theory in terms of them? Returning to the awkward construction (26), one idea is to revise it to include instructions dictating a shift to a semantic framework when analyzing sentences like (5-7). Isolating one difference between (5) and (6-7), we could invent a rule like (28).

28. <u>Extraordinary Binding Conditions</u>

> An instance of binding is extraordinary if the NP in question is conjoined with some other NP. In such an instance, the rules governing the choice of a reflexive, pronoun or r-expression are based on semantic rather than syntactic constraints.

As noted above, (26) seemed arbitrary and unintuitive. (28) appears to be even worse in these respects. Conjoined NPs occur in many types of sentences, very frequently, without causing anything extraordinary to happen.[4]   And what about sentences like (5a-b)? (28) still fails, because the pronoun is not conjoined with anything while the rigid rule yields the result, (5b), that matches the intuition of only about a quarter of those surveyed. Moreover, some of those speakers protested that the sentence still 'sounded funny' and noted that they only made the choice when forced. A slight majority chose (5a), yet even our revised rule fails to account for the discord among native speakers in a context like this. Singling out conjoined NPs for special treatment does not seem to yield very robust results. Moreover, even after (28) selects sentences with conjoined NPs to get special treatment, it fails to tell us what the special treatment should be. All (28) really accomplishes is to convince us to consider a Semantic Binding Theory approach toward sentences like (5-7).

Napoli (1993) proposes the following conditions under which Binding Condition A may be violated.

29.   I. A situation that we know from linguistic or nonlinguistic information involves identity of two of the role players in a single event.

II. A prevailing point of view or perception that makes us interpret an event through the eyes (or ears or any other cognitive mechanism) of a given person, which person serves as the antecedent for the anaphor. (p.517)

When either (I) or (II) is present, Binding Condition A may be violated and a Long-Distance anaphora is allowed to be grammatical without being bound in its GC.

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[4] For just a sampling, note the many conjoined NPs in the sentences found in this thesis and my classmates' theses.

The new rules must be tested to show that they account for common constructions as well as the problematic data in (5-7). Recall our original data set of common sentences like (1), where the dichotomy between pronominals and reflexives is clear.

1a. John$_i$ enjoyed himself$_i$ at the party.
1b. *John$_i$ enjoyed him$_i$ at the party.

We have no need to change the account of (1-4) given in sections 3.1 and 3.2. (5-7), however, provide an opportunity for (29I) to apply, since they clearly involve the identities of two role players in a single event. In fact, the involvement of the two identities intuitively seems to be the source of people's uncertainty about whether to use a pronominal or an anaphor. (29I) seems to provide a compelling account of the problematic data. Nevertheless, the total reframing of Binding Theory in terms of semantic constructions suggested by this maneuver would cause a cascade of far-reaching effects (for example, by disrupting the ECP). Such drastic measures do not seem to be warranted by the problem data examined here.

5 Optimality Theory applied to syntax

Unfortunately, there doesn't seem to be much we can do to modify our rules to account for (5a) without making major change(s) to more than one of our rules, which would then set off an unwanted chain of reactions affecting the analyses of many other sentences. Before we conclude that syntax is impotent in this situation, however, it is prudent to examine other syntactic theories to assess whether they are capable of handling ambiguous sentences like (5-7) better than government and binding theory. Optimality Theory is one such alternative theory, providing a framework especially adapted to handle ambiguity.[5]

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[5] For strenuous arguments for and against Functionality-Based Optimality-Theoretic Syntax, see Bresnan and Aissen (2002) and Newmeyer (2002), respectively.

5.1 A Brief OT background

Optimality Theory (OT) developed relatively recently, first gaining widespread usage in

phonology. Unlike generative grammar, OT does not have rules specifying grammatical

outputs, although it does use a "combinatorial engine" to generate the forms to be evaluated.

Rather, OT utilizes constraints to evaluate the candidates generated by the engine. The

constraints themselves are claimed to be universal, but their rank varies depending on the

language being studied. All constraints, no matter what their rank in a particular language,

are violable. However, violations of the most highly ranked constraints penalize candidates

the most. The optimal form is the candidate with the fewest, weakest violations. As Bresnan

and Aissen (2002) put it:

> Which structures are selected as the outputs of particular grammars is
> determined by the relative strength of very general but violable constraints
> external to [the combinatorial engine]. Given the language-particular
> constraint strengths, the selection process (the optimization function)
> minimizes the maximum constraint violation.

The main advantage of OT is that the optimal form may be permitted to violate one or more

constraints.

This violability contrasts sharply with the inviolability of the principles set forth in the

theories used in sections (2-4) above. X-bar Theory provides a framework of invariable

principles of phrase structure. According to this view, the principles stated are held to have

universal cores. Any form that violates one of these principles is automatically

ungrammatical. Within this consistent framework of principles, differences between

languages are the result of changes in the settings of certain variable parameters of the

principles.[6] In contrast, OT accounts for variation between languages by rearranging the ranking order of the universal constraints.

5.2 Syntactic OT

An OT approach to syntax employs two functions: GEN and EVAL. GEN takes a given input and generates the set of possible outputs. These outputs then become the candidates that are evaluated by EVAL. EVAL selects the optimal candidate(s) by testing all of the candidates using the constraint hierarchy, as explained in (5.1). The optimal form(s) are grammatical; all the other candidates are ungrammatical. (Speas, 1997)

Although Optimality Theory has been fruitful and productive in the field of phonology, it has not been widely applied to syntax. Different authors have their own theories about why syntacticians have been reluctant to embrace OT; a few potential reservations are explored in (5.4). Nevertheless, some linguists claim that OT better accounts for certain phenomena than rigid principles and variable parameters. Speas (1997) claims that the supposedly inviolable principles are in fact "formulated so as to contain their violability within a clause of the principle itself." (p. 185) She calls these clauses "hedges" and notes that they permit the principles to be violated when violation is necessary to obey one or more other principles.

For example, consider Binding Condition B, given in (15B) and reprinted below:

(15) B. A pronoun cannot be bound in its GC.

Speas lists this among the best-known principles of Principles and Parameters Theory (PPT) in a chart dividing familiar principles into their "Essences" and the "Hedges" that allow them

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[6] The only parameters the MP allows to vary are those involving grammatical features, for example, Case, Agreement and Tense. (Chomsky, 1995)

to be selectively violated. Like all the principles she lists, the familiar formulation of Binding

Condition B is its "Essence" and appears to be inviolable. However, Binding Condition B

turns out to make exceptions under the condition shown in (32).

(32) "…unless it occurs in an idiom like *lose her temper*" (p. 184).

This hedge allows Binding Condition B to be violated when the pronoun occurs in an idiom

so that other principles will not be violated. In effect, hedges allow the principles to be

ranked with respect to one another. Speas goes on to show how OT can account for Null

Pronouns in a more natural way, using violable constraints instead of principles weakened by

hedges. Moreover, she incorporates X-Bar Theory into her GEN, so the candidates that she

considers adhere to X-Bar Theory.

5.3 Optimality Theory and the problem data

We can recast Binding Conditions A and B into OT constraints (33) and (34) (adapted from

Speas 1997, p. 189).

33. GOVERN ANAPHOR: An anaphor must be governed in its GC
34. FREE PRONOUN: A pronoun must be free in its GC.

The constraints do not appear to differ much from the Binding Conditions. Using these

constraints to evaluate (1a-b) and (4a-b) results in the Optimality Theory tableaux shown in

(35-36).

35.

John$_i$ enjoyed [NP$_i$]at the party	GOVERN ANAPHOR	FREE PRONOUN
John$_i$ enjoyed himself$_i$ at the party.		—
*John$_i$ enjoyed him$_i$ at the party.	—	*!

36.

John$_i$ believed that [NP$_i$] would succeed.	GOVERN ANAPHOR	FREE PRONOUN
*John$_i$ believed that himself$_i$ would succeed.	*!	
John$_i$ believed that he$_i$ would succeed.	—	

Moreover, the optimal forms that result from the application of these constraints to sentences

(1-4) are the same grammatical sentences that the grammar from 2.3-2.4 generates. Now that

we have established that the data that pose no problem for Binding Theory can also be

accounted for using Optimality Theory, we are ready to see how OT accounts for the data that

Binding Theory struggles with.

5.4 Syntax, OT and Semantics

OT distinguishes itself when we turn to the problem data. With just the two constraints

described above, OT falls into the same trap as Binding Theory. As we add more constraints,

however, OT shows its strength. Instead of forcing us to choose between a syntactic approach

and a semantic approach, as Binding Theory does, OT lends itself to integrating semantic

constraints with syntactic constraints.

The semantic factors in (29) from section 4.2 can be expressed as the semantic

constraints shown in (37) and (38).

37. DUAL IDENTITY: Use an anaphor when the identities of two of the role players
are known (via linguistic or nonlinguistic information) to be involved in a single event

38. VIEWPOINT: Use an anaphor to interpret an event through the cognitive mechanism of a given person, who serves as the antecedent for the anaphor

Only DUAL IDENTITY bears on the problematic sentences considered in this paper, so further exploration of the VIEWPOINT constraint is left to the reader. Adding the DUAL IDENTITY constraint to our tableaux enables us to handle sentences like (5-7) by rearranging the ranking order of the constraints. For example, if DUAL IDENTITY >> GOVERN ANAPHORA/FREE PRONOUN, then the tableau in (39) results.

39.

Sally talked to John$_i$ about [NP]$_i$.	DUAL IDENTITY	GOVERN ANAPHOR	FREE PRONOUN
☞ Sally talked to John$_i$ about himself$_i$.		*	—
Sally talked to John$_i$ about him$_i$.	*!		

Conversely, if GOVERN ANAPHOR/FREE PRONOUN >> DUAL IDENTITY, then (40) results.

40.

Sally talked to John$_i$ about [NP]$_i$.	GOVERN ANAPHOR	FREE PRONOUN	DUAL IDENTITY
Sally talked to John$_i$ about himself$_i$.	*!		
☞ Sally talked to John$_i$ about him$_i$.	—		*!

In this way, Optimality Theory can account for variation between speakers by attributing their differences to different rankings of the constraints. The question still remains, however, of how to account for variation in the rankings *between* speakers. Since semantic constraints play such an active role, perhaps their relative rankings vary according to discourse constraints or are effected by the presences or lack of common ground between speakers.

Exploring these effects in greater detail seems a likely next step along the path to truly integrating the study of syntax with that of semantics.

7 Conclusion

Binding Theory and generative syntax are very powerful tools that account for a wide range of data. Nevertheless, the rules they employ do not seem to have room to accommodate sentences like (5-7). These types of sentences engender confusion even among native speakers and seem to be strongly affected by semantic context. In order to account for data like these without abandoning the generative rules that are otherwise so useful, OT can help to integrate syntax and semantics and explain the problematic nature of ambiguous sentences.

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Appendix A: Survey

I wrote up the following e-mail survey as part of my final paper for Intermediate Syntax with Kari Swingle. I sent it to 80 students from Swarthmore college. 50 people replied; the responses are summarized in Appendix B. This is not, nor was it intended to be, a scientific poll. It is merely intended to illustrate the true lack of consensus over whether to use a reflexive or a pronominal in sentences of this type.

Survey
Hi guys,
Please take 2 minutes and fill out this survey. The results are for a paper I'm writing. Thank you thank you thank you in advance!
~Krista

For each sentences, please indicate which pronoun you would choose to take the place of the second "John" by placing an "X" next to your choice. There are no right or wrong answers, just go with what "sounds best" to you.

1. Sue talked to John about <u>John</u>.
   a.him
   b.himself
   c.other (please explain)_____

2. Sue talked to John about <u>John</u> and his family.
   a.him
   b.himself
   c.other (please explain)_____

3. Sue talked to John about <u>John</u> and his work ethic.
   a.him
   b.himself
   c.other (please explain)_____

Other comments on these sentences:

Gender:

Native language:

Thank you!

Appendix B: Results of Survey

Frequency table of responses

Question #↓ Response →	A	B	C
1	13	30	7
2	35	10	5
3	27	17	6

Frequency table for 3-response combinations

Question 1	Question 2	Question 3	# respondents whose answers fit the pattern ↓
A	A	A	7
A	A	B	1
A	B	A	2
A	B	B	1
A	B	C	1
A	C	A	1

B	A	A	15
B	A	B	9
B	B	B	6

C	A	A	2
C	A	C	1
C	C	C	4

Demographics

33 female, 27 male

45 native American English speakers, 5 other (all are fluent in American English)

Free Responses

Reasons given by those who selected "C" for their answer(s) (question # given in parentheses):

wouldn't use a pronoun (1&3)

he (2)

herself (1)

Sue talked to John about his work ethic (3)

john spoke to sue about himself---john spoke to sue about himself and his family---john talked to sue about himself and his work ethic (1, 2, 3)

"the latter" or even just "John." (1)

 both just sound odd; i would say "herself" or "her problems" or some other phrase---i like the way it is---i would take out "john" altogether (1, 2, 3)

Sue talked to John about his work ethic. (3)

Responses to the final question:

I would replace them all with some more descriptive reference to the subject of the conversation - i.e., Sue talked to John about various aspects of his personality; Sue talked to John about his family and their relationship to him; Sue talked to John about his work ethic and other personal traits. I guess of any single pronoun, "him" would be correct, but in each of these sentences "him" would sound like a reference to a third person. I would think that "himself" means that Sue is male and talking about himself. I hope this helps!

These are sentences that I'd question myself saying, so if I wrote them I'd figure out a totally different way to configure them. I don't know if this applies more to sociology or linguistics, but if I were to say those sentences in conversation, I'd probably qualify them with another sentence afterward. For example, I'd probably say, "Sue talked to John about him. About John, I mean."

There seems to be something fishy about all of them...I would most likely (if given the choice) avoid saying them at all.....

i feel 100% retarded because i dont really care about syntax and none of the sentences sound very good to me. i would never use the sentence "sue talked to John about anything..." so it doesnt actually really matter to me, however i would like to know what the real answer is.... please get back to me with that. thanks.. wait, that means i must care about syntax!! haha

if you put himself in the first one it sounds like sue is a man.

In 1) and 2), in conversation I think I'd probably avoid using the pronoun at all. Even the clumsy "John about John" is clearer in my mind than using either pronoun.

Yeah Krista! An English grammar test! Yupie! I left what I thought sounded best.
P.S. Of course there are right answers!

I am only taking this if you promise not to laugh at how bad my grammer is!

I don't think anyone would actually phrase a sentence like these are phrased... They just seem kind of weird.

If I screwed up a sentence, it's cause I don't do weird sentences like this :-P

Final thoughts
Note the confusion expressed by many of those surveyed, as well as the astute observations of some. Their comments indicate that many individuals do not have a clear conception what sounds best to their own ears; the ambiguity exits within individuals as well as across the group.

In informal discussions, a rather large number of speakers appear to change their responses from pronominal to reflexive when the sentence is changed from third to first person. That is, they would select (1a) but (4b).
        1a. ?Sue talked to $John_i$ about him_i.
        1b. ?Sue talked to $John_i$ about $himself_i$.
        4a. ?Sue talked to me_i about me_i.
        4b. ?Sue talked to me_i about $mymself_i$.
I suggest that further investigation should include parallel sets of sentences in first, second and third person to isolate any differences between them.