Not Moving Clauses: Connectivity in Clausal Arguments

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Abstract. Novel reconstruction data is introduced which argues that clauses do not move leftward, thus contributing to a long-standing debate about sentential subjects and topics (Koster 1978, Alrenga 2005). Although fronted clauses appear to reconstruct for variable-binding purposes, I offer several arguments that these bound-variable interpretations are only apparent. First, left-dislocated CPs do not exhibit the kinds of reconstruction interactions that hold of other moved constituents, as discovered by Lebeaux (1991). Second, we find apparent bound variables in left-dislocated CPs that can be shown to have no movement source that would provide a site for reconstruction. I will then provide a detailed analysis that marshals the semantics of *de re* pronouns to explain why covariation without reconstruction is available in these dislocated CPs. Aside from offering a detailed syntax–semantics for clausal comple-mentation, I make the case that there must be syntactic derivations of sentential subjects and topics that do not involve movement and that a parsimonious theory rules out movement of clausal arguments altogether.

1. Introduction

According to a standard picture, the distribution of arguments is subject to syntactic requirements (licensing requirements, like case) and semantic requirements (on their merge position). In many cases, these two requirements compete: arguments can be interpreted in positions other than those in which they surface. It is movement, particularly as understood under the copy theory (Chomsky 1995, Fox 1999, Sauerland 1998, among others), that mediates between these requirements. This standard picture, however, is designed for nominal arguments. How clausal arguments fit this picture is currently unknown, principally because the exact syntactic licensing requirements of clauses are unknown. Although clauses clearly distribute differently than DPs, the debate persists about whether clausal arguments bear the same grammatical functions as DP arguments. For instance, some have interpreted data like those in (1) as suggesting that sentential subjects do not exist (Koster 1978).

(1) a. *?To what extent is that the moon is made of cheese a theory worth considering?
    b. To what extent is the theory that the moon is made of cheese worth considering?

Others point out that extragrammatical pressures may account for the judgments in (1), obscuring the positions in which the grammar places clauses (Delahunty 1983, Davies & Dubinsky 2010).

In this paper, I turn to interpretative properties to diagnose the syntactic derivations that distribute clausal arguments and ask whether movement is involved. Using reconstruction data I provide novel arguments that clausal arguments do not undergo leftward movement. First, clauses do not show the kinds of "reconstruction conflicts" that are found with other moved constituents. I will then show that this is a general property of clausal arguments: they can give rise to bound-variable interpretations for pronouns they contain without having to syntactically reconstruct below the pronouns' (apparent) binders. A substantial part of this paper is devoted to giving an explicit syntax–semantics for clausal arguments that derives covariation without binding, using the mechanisms that interpret *de se* and *de re* pronouns in attitude ascriptions. I then show that the proposal makes a number of correct predictions. These include the availability of sloppy interpretations for pronouns in CPs in a wider set of circumstances than pronouns in DPs and new reconstruction data involving complements to nouns. I then develop from these new facts an argument that the grammar simply does not move clausal arguments.

2. Movement, Connectivity, and Clauses

Connectivity effects are often used as diagnostics of movement. The availability of bound-variable interpretations for pronouns can track the positions from which their containing phrases move. A bound-variable interpretation is available for the pronoun in the raising construction in (2a) because the phrase *a student in his class* has moved from a position below the quantifier *any teacher*. A comparable bound-variable interpretation is unavailable in the control construction in (2b).

(2) a.   A student in his$_1$ class didn't seem to any teacher$_1$ to be paying attention.
    b.   *A student in his$_1$ class didn't tell any teacher$_1$ to pay attention.

On the copy theory of movement, (2a) has the representation in (3a), where there is an occurrence of the pronoun in the lower copy that puts it in the scope of the quantifier that binds it.[1] No such copy exists in the control construction (3b). (Copies are enclosed in angle brackets.)

(3) a.   ⟨A student in his$_1$ class⟩ didn't seem to any teacher$_1$ ⟨a student in his$_1$ class⟩ to be paying attention.
    b.   *⟨A student in his$_1$ class⟩ didn't tell any teacher$_1$ to pay attention.

Bound variable interpretations, then, can be diagnostic of movement.

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[1] Whether some kind of (modified) c-command is required for variable binding (Reinhart 1983) or just scope (Barker 2008) is a question I put aside because, either way, connectivity diagnoses reconstruction. However, we need to make sure that the good examples are not cases of grammatical weak crossover, which is known to exist. In all the following examples, the quantificational binder is an NPI, which keeps its scope low and thereby prevents a crossover possibility.

At first glance, left-dislocated clauses show evidence of movement because of similar reconstruction effects.[2] We get a bound-variable interpretation for pronouns in the sentential topic and sentential subject in (4).

(4)   a.   That he$_1$'ll end up looking like his father doesn't seem to any young man$_1$ to be very likely.
      b.   That he$_1$'ll end up looking like his father, every young man$_1$ expects.

The interpretation of the pronoun *he$_1$* varies according to the choice of men picked out by the quantifier *any*. The usual conclusion (see, e.g., Takahashi 2010) is that this interpretation corresponds to a bound-variable one and that this in turn implies that the clause moved from a position below the quantifier.

At the same time, dislocated CPs can bleed condition C of the binding theory. Here is a (contrastive) CP topic:[3]

(5)   That Texas would be a surprise was always possible, but …
      a.   that Ms. Brown$_1$ would lose Ohio, she$_1$ never expected.
      b.   that she$_1$ would lose Ohio, Ms. Brown$_1$ never expected.
      c.   *she$_1$ never expected that Ms. Brown$_1$ would lose Ohio.

Neither of these reconstruction effects is enough, however, to conclude that CPs *syntactically* reconstruct. Syntactic reconstruction is reconstruction that arises by interpreting a copy of the moved phrase in a trace position so that the c-command requirement on binding can be satisfied. But bound-variable interpretations for pronouns can arise in ways that do not necessarily implicate the mechanisms of syntactic movement, or even c-command of the bound variable. Various mechanisms, which we can group under the label *semantic reconstruction*, can give rise to bound-variable interpretations for pronouns without requiring a copy of the bound variable in a gap position (Chierchia 1995, Sharvit 1999, Jacobson 1999, Sternefeld 2000). These mechanisms leave open the possibility suggested by Koster (1978) that left-dislocated CPs are related to their gaps not by movement, but by a null operator.

In this paper, I give arguments that Koster's null-operator analysis is correct and I show that variable binding in fronted CPs is only apparent. The first piece of evidence comes from a diagnostic due to Lebeaux (1991) that involves creating "reconstruction conflicts." The second piece of evidence involves an undocumented kind of topicalized CP, one related to a gap which we can verify on independent grounds is

[2] Some notes on terminology: I describe sentential subjects and sentential topics as "left-dislocated" and "fronted" without implying that movement puts them there. I use the terms *connectivity* and *reconstruction* (for variable binding) interchangeably, as simply descriptions of the empirical observations. The substantive question is whether the effects diagnose *syntactic* reconstruction or simply *semantic* reconstruction, notions to be defined below.

[3] We expect sentential subjects to bleed condition C since A-movement in general can. Throughout the discussions that follow, I focus on A′-movement of clauses (topicalization) as the representative case. The topicalization that seems most natural is a contrastive one, and an antecedent sentence is given to support this information structure.

not one left by movement of the CP. Nonetheless bound-variable interpretations are available here, too.

2.1. *The Absence of Reconstruction Conflicts*

Lebeaux's (1991) strategy, furthered exploited by Romero (1998) and Fox (1999), was to create a conflict between different principles of the binding theory. If the familiar conditions of the binding theory are operative (at the same level of representation), we should expect various co-occurence conditions. Take, for instance, two familiar binding-theoretic principles: (i) bound-variable interpretations of pronouns arise only if those pronouns are c-commanded by their quantificational binders and (ii) referring expressions must not be c-commanded by covalued pronouns (condition C). Sentences that put these two requirements in conflict should be ungrammatical. The configurations that create "reconstruction conflicts" have the following shape (Fox 2000):

(6)   a. $[_{XP}\ldots$ pronoun$_1\ldots$ r-expression$_2\ldots$] $\ldots$ pronoun$_2\ldots$ $*t_{XP}\ldots$ QP$_1$ $*t_{XP}\ldots$
      b. $[_{XP}\ldots$ pronoun$_1\ldots$ r-expression$_2\ldots$] $\ldots$ QP$_1\ldots^{ok}t_{XP}\ldots$ pronoun$_2\ldots$ $*t_{XP}\ldots$
                                                                                          (Fox 2000:149, (9))

On these assumptions, there must be a copy of XP in the lower of the two reconstruction positions in (6a), indicated by t_{XP}, for variable-binding purposes. But interpreting a copy there puts the referring expression below a covalued pronoun and so feeds a condition C violation. Any higher reconstruction site in that same configuration fails to derive variable binding. In the configuration in (6b) on the other hand, XP can reconstruct to a higher position that allows for variable binding but does not induce a condition C violation.[4] Indeed, the facts support the prediction: reconstruction for variable binding feeds condition C (Lebeaux 1991, Fox 1999). The sentences in (7a) and (7b) are examples constructed following the design in (6a) and (6b), respectively.

(7)   a.   *Which part that he$_1$ played with Madonna$_2$ did she$_2$ think that every
           aspiring actor$_1$ had failed at?
      b.   Which part that he$_1$ played with Madonna$_2$ did every aspiring actor$_1$ wish
           that she$_2$ would support?   (Lebeaux 1991:223, (43))

In (7a), the only copy site that allows for variable binding is the low one. Interpreting the copy there would give rise to a condition C violation. In (7b), on the other hand, given the assumption (see fn. 4) that there is a landing site (and therefore a copy) of the moved phrase at the edge of the matrix VP, there is a copy above the pronoun but below the quantifier:

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[4] This, of course, relies on there being a position for such an intermediate copy at the edge of VP. For evidence, see Nissenbaum 2000.

(8) ⟨which part that he₁ played with Madonna₂⟩ did every aspiring actor₁ [VP ⟨which part that he₁ played with Madonna₂⟩ wish that she₂ would support ⟨which part that he₁ played with Madonna₂⟩]

In the intermediate position, the copy satisfies both condition C and variable binding. Further technology is needed, on the copy theory of movement, to explain why the lowest copy in (8) does not introduce a condition C effect. Lebeaux's (1988) solution is countercyclic merger. Updated as late-merger, it allows certain parts of a phrase, like modifiers, to be present in some copies but not others (Lebeaux 1988, Chomsky 1995, Fox 2002). In (7b), the relative can be late-merged to the intermediate copy, allowing for variable binding but bleeding condition C:

(9) ⟨which part⟩ did every aspiring actor₁ [VP⟨which part that he₁ played with Madonna₂⟩ wish that she₂ would support ⟨which part⟩]

The same effect carries over to other A′-movements, including topicalized DPs in (10) and (11).

(10) a. *… But the paper that he₁ gave to Mrs. Brown₂, I don't think she₂ would want any man₁ to read.
     b. … But the paper that he₁ gave to Mrs. Brown₂, I don't think any man₁ would want her₁ to read.

(11) a. *… But the part that he₁ played with Madonna₂, she₂ thinks that every aspiring actor₁ had failed at.
     b. … But the part that he₁ played with Madonna₂, every aspiring actor₁ wished that she₂ would support.

Neither (7a), (10a), nor (11a) put a copy of the moved phrases in a position to which the relative can adjoin and simultaneously allow variable binding and bleed condition C.

   Turning to left-dislocated CPs, we expect that if the bound-variable interpretations of pronouns they contain are achieved via syntactic reconstruction, then this will feed condition C. The following sentence in (12) is structurally identical to the scheme laid out in (6a). The result, however, is different compared to (7a)–(11a).

(12) … But that he₁ might be too old for Mrs. Brown₂, I don't think she₂ would want any man₁ to believe.

The pronoun can get a covarying interpretation without a disjoint-reference effect for the referring expression, in contrast to (10a). The controls for (12) are reported in (13): (13a) is a control where no binding-theoretic conflict would arise (we already saw that condition C is bled by CP fronting in the simple case); (13b) is the control in which no variable binding is required; and (13c) is a control where no condition C violation would arise. A variable interpretation is just as available for the pronoun in (12) as it is in these cases.

(13) a. … But that he$_1$ might be too old for Mrs. Brown$_2$, I don't think any man$_1$ would want her$_1$ to believe.

    b. … But that John$_1$ might be too old for Mrs. Brown$_2$, I don't think he$_1$ would want her$_1$ to believe.

    c. … But that he$_1$ might be too old for her$_2$, I don't think any man$_1$ would want Mrs. Brown$_1$ to believe.

The final relevant control for (12) is (14): the CP in situ gives rise to a disjoint-reference effect.

(14) *?I don't think she$_2$ would want any man$_1$ to believe that he$_1$ might be too old for Mrs. Brown$_2$.

Some speakers find that the presence of a dislocated resumptive, as in (15), improves (12). Koster (1978) notes that a similar construction is available in Dutch, where the construction (often called *Contrastive Left Dislocation* [CLD]) involves a left-dislocated *d*-series pronoun (Riemsdijk & Zwarts [1974] 1997).[5] I'll adopt that term for the English analogue. Notably, CP-CLD has the same reconstruction profile as CP topicalization.

(15) … But that he$_1$ might be too old for Mrs. Brown$_2$, *that* I don't think she$_2$ would want any man$_1$ to believe.

There remains a possible confound in the data that needs to be addressed—namely, the distance in (12) between the pronoun *she* and the referring expression *Mrs. Brown*, which may alleviate a condition C violation (Reinhart 1983). The following examples control for this problem. In (16), the referring expression is in the immediate complement of the matrix verb and we find a strong disjoint-reference effect:

(16) *He$_1$ didn't expect of any woman$_2$ that she$_2$ would actually ask John$_1$ out on a date.

When the clause is fronted, as in (17a), the condition C violation is alleviated, and yet a covarying interpretation for the pronoun remains possible Example (17b) is the control.

(17) a. That she$_2$ would actually ask John$_1$ out on a date, (that) he$_1$ didn't expect of any girl in his class$_2$.

    b. That she$_2$ would actually ask him$_1$ out on a date, (that) John$_1$ didn't expect of any girl in his class$_2$.

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[5] An example of the construction in Dutch:

(i) Dat hij komt (dat) is duidelijk.
   that he comes that is clear
   'That he will come, that is clear.'

Whereas DPs give rise to "reconstruction conflicts," such conflicts are absent for clauses. Two possibilities arise. Either clauses reconstruct syntactically but condition C effects do not obtain for independent reasons, or clauses are base-generated high, thereby bleeding condition C, and the bound-variable interpretations are achieved in a way that does not require c-command. In the next section, I show that the latter is the case: it is a general property of clausal arguments that they allow pronouns to covary without having to be c-commanded by their apparent quantificational binders.[6] This evidence will come from some overlooked instances of null complement anaphora with clausal antecedents.

2.2. CPs and Null Complement Anaphora

The pronouns in the left-dislocated clauses in (18) can covary as a function of quantifiers in the main clause. That is, they appear to be bound pronouns, and this would suggest that the CPs moved from a position c-commanded by the quantifiers.

(18) It was clear that something bad was going to happen …
    a. … but that he_1 was in real danger, no $banker_1$ had any clue.
    b. … but that he_1 was in real danger, every SEC $member_1$ was unaware.
    c. … but that her_1 company was in real danger, many $CEOs_1$ had no idea.

It can be shown, however, that these constructions are not derived by movement of the CP. Rather, we will see that they involve a null complement anaphor with a CP antecedent base-generated in topic position. Given that there is no movement of the CP, the bound-variable interpretations cannot be derived by reconstruction, and so we find yet another case where clauses can show apparent reconstruction effects without participating in a movement relation.

   The first indication that the fronted clauses in (18) are not derived by movement is the fact that they counterexemplify the well-known property of moved clauses: that they can only leave traces in position in which DPs are otherwise allowed (Williams 1981, Grimshaw 1982, Postal 1986). For example, there are a number of predicates that take CP but not DP complements (19a)/(19b)–(21a)/(21b) and yet do not allow those CPs to front (19c)–(21c). Examples of such predicates include adjectives (19), unaccusative verbs like *seem, appear*, and *turn out* (20) and the transitive verbs *boast* and *complain* (Postal 1994) in (21).

(19) a.   I am happy that it will finally rain.   CP complement
     b. *I am happy that.   *DP
     c. *That it will finally rain, I am happy.   *CP topic

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[6] Binding without c-command often suggests E- or D-type pronouns (Evans 1977, Elbourne 2005). However, because a covarying interpretation for the pronouns in sentences like (7a) is not available, a D-type approach—although perhaps not ruled out—would need to explain why it cannot apply in these cases.

(20) a.   It seems/turns outs/appears that John lost.   CP complement
     b. *Johns losing seems/turns out/appears.   *DP
     c. *That John lost seems/turns out/appears.   *CP subject

(21) a.   John complained/boasted that he could lift 100 pounds.   CP complement
     b. *John complained/boasted that.   *DP
     c. *That he could lift 100 pounds, John complained/boasted.   *CP topic

Adjectives *can* license a fronted CP as long as the gap is introduced by an epenthetic preposition, which serves to license a DP.

(22) a. *I am happy about that it will finally rain.
     b.   I am happy about that.

(22) a. *That it will rain, I am not happy.
     b.   That it will rain, I am not happy about.

I will register this requirement as the DP Requirement.

(24) The DP Requirement
      The gap of a fronted CP (sentential subject or topic) must be a DP.

It is surprising, then, that the adjective and nouns in (18) *clue*, *suspicion, idea*, and *aware*, allow fronted CPs. None take DP complements.

(25) a. *I had no clue/suspicion/idea that.
     b.   I had no clue/suspicion/idea that he left.

(26) a. *I was aware that fact.
     b.   I was aware that he left.

They should pattern like the cases in (19)–(21), but they do not. Moreover, an epenthetic preposition in the gap position in the sentences in (18) even degrades acceptability of a fronted CP—or at least changes the intended meaning—unlike the effect prepositions have in (23).[7]

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[7] The reason why epenthetic prepositions are not possible in (27) and (28) is explained, jumping ahead a little, by the fact that the gap positions in these constructions are occupied by null complement anaphors (NCA). And null complement anaphors can never be DPs (Depiante 2001, Haynie 2009) as in (ib). So it is unsurprising that prepositions cannot introduce them.

  (i) a.   The board considered the new proposal but half of the members objected.
                                                    (NCA = to the new proposal)
      b. *The board considered the new proposal but half of the members objected to. (Haynie 2009:(2))
           cf. Which/The new proposal (did) half of the members object to?

(27) a. ??… That he$_1$ was in danger, no boy$_1$ had a clue about.
   b. … That he$_1$ was in danger, no boy$_1$ had a clue.

(28) a. ??… But that he$_1$ was actually in danger, no boy$_1$ had any idea about.
   b. … But that he$_1$ was actually in danger, no boy$_1$ had any idea.

Of course, one could argue that the constructions in (18) just show that the DP Requirement is too strong. However, there is a systematic correlation that shows that these are only apparent counterexamples, and that they actually arise from a syntax slightly different from the structures that motivate the DP Requirement. It turns out that the CP-taking predicates in (18) that license fronted CPs are just those predicates that also license null complement anaphora (NCA).

   In NCA, the object position of a predicate is occupied by a null pro-form that can be of the category CP (Hankamer & Sag 1976, Grimshaw 1979). What is missing here is a CP whose meaning is related to the first conjunct.[8]

(29) Fred moved to Paris but Mary didn't know/was not aware/had no idea.

Just those nouns and adjectives that independently allow NCA also allow a left-dislocated CP to be construed as the complement (without a preposition) in apparent violation of the DP Requirement. This is demonstrated in (30)–(34). In the (a) examples, a topic CP is related to a gap after a noun or adjective. The (b) examples show the general availability of NCA with that noun or adjective, where the antecedent for NCA is a nontopicalized clause.[9]

(30) a. I knew that Rita didn't report all her income. But that she was stealing from the company, I was not aware.
   b. Rita was stealing from the company? Gosh, I was not aware.

(31) a. I knew they would try to repair the damages. But that they would offer to replace the whole product, I had no idea.
   b. They are going to replace the whole product? I had no idea.

(32) a. It was clear to the victims that something terrible was going to happen. But that they were in real danger, none of them had a clue.
   b. The victims were in real danger, but none of them had a clue.

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[8] In principle, the NCA could be a PP here (e.g., *no clue about that*). Nothing I have proposed requires the null pro-form to be of the same category as its antecedent.

[9] To license NCA, some of these nouns and adjectives seem to need to be part of a light-verb construction: *have no/a* N/Adj. For instance the example? *John was in danger, but I did not possess the clue* does not support NCA. I do not speculate on the source of this requirement but note that it does not impede the arguments made here, which is simply that these expressions do not take DPs. Fortunately, we do not need to know what allows a predicate to license NCA in order to use it for our purposes.

(33) a. I could see that the students were exchanging notes. And that they were
            cheating, I had a hunch.
       b. The students were cheating? I had a hunch.

(34) a. John did not know that he was being followed. But that his phone was being
            tapped, he had a suspicion.
       b. John's phone was being tapped? Yeah, I had a suspicion.

Those nouns and adjectives that do not independently allow NCA are just those that
prohibit topicalized *that* clauses to antecede the gap:

(35) a. *John did not know that he was being followed. But that his phone was
            being tapped, he had a belief.
       b. *John's phone was being tapped? Yeah, I had a belief.

(36) a. *I knew they were going to celebrate the promotion somehow. But that there
            might be a huge party, I read Joe's message.
       b. *There's going to be a huge party? Really? I read Joe's message.

(37) a. *The evidence didn't suggest that there was foul play involved. But that
            there was something fishy about things, the detective made claims.
       b. *The evidence didn't suggest that there was foul play involved, but the
            detective made claims.

(38) a. *It was pretty obvious to Sue that she was pregnant. But that she was going
            to have twins, she didn't have an intuition.
       b. *Sue was going to have twins, but she didn't have an intuition.

(39) a. *I knew that Nan was going to France. But that she was going to stay for a
            month, I didn't hear any rumor.
       b. *Nan is going to stay for a month in France? Gosh, I didn't hear any rumor.

It is true, as one reviewer has pointed out, that the (a) sentences in (30)–(34) are not
perfect. What is important, however, is that speakers perceive a relative difference in
acceptability between (30a)–(34a) and (35a)–(39a). This difference was tested in a
written questionnaire, completed by nine native speakers to determine the relative
acceptability of the sentences in (30)–(39). Participants rated the above sentences on a
scale of 1 through 4, with higher numbers indicating higher acceptability. Although
this a nonstandard scale, it was chosen to require participants to make a forced choice.
For the (a) examples in (30)–(34) (those that are predicted to be good) the average
rating was 3.00/4, and the (b) cases 3.60/4. As to the non-NCA predicates in (35)–
(39), the average rating for the (a) cases was 1.58/4 and for the (b) sentences, 2.00/4.
Two control sentences that contained sentential topics of an uncontroversial sort were
included as well, to determine if the participants accepted sentential topics in general.
They were judged on average at 3.50/4.

There appear to be two main effects. First, for both the NCA and non-NCA predicates, having the antecedent as an independent clause was preferable, by 0.4–0.6 points, to a topicalized CP antecedent. The second effect—the one of importance here—is the difference between the NCA and non-NCA predicates in admitting of a topicalized CP antecedent: 3/4 versus 1.58/4. Whereas topicalized CP antecedents for NCA gaps may be less natural than independent clauses, their relative acceptability compared to the sentences in (35a)–(39a) shows that it is the availability of NCA that lets these construction get around, so to speak, the DP Requirement. Although the investigation requires a full-scale experiment, the results suggest a contrast.

I conclude, then, that these CPs have not moved from the gap position. If they did, there would be no explanation for why their distribution is limited to leaving gaps that just happen to correspond to positions where NCA is independently licensed. And, as noted at the outset of this section, pronouns in such CPs can covary as a function of quantifiers in the matrix clause. No movement of the CP, so no reconstruction, but bound-variable interpretations are available nonetheless.

Moreover, the availability of the bound-variable interpretation appears to be determined by whether the pronoun is in a topic clause. Pronouns in independent clauses that antecede NCA do not give rise to bound-variable interpretations.

(40) a. *He_1 was in real danger. But no banker$_1$ had any clue.
  b. *He_1 was in real danger. But every SEC member$_1$ was unaware.
  c. *Someone put her$_1$ company in real danger. But many CEOs$_1$ had no idea.

Backward pronominalization, however, *is* permitted in these configurations:

(41) a. He_1 was in real danger. But Roger$_1$ had no clue.
  b. He_1 was in real danger. But John$_1$ was unaware.
  d. Someone put her$_1$ company in real danger. But Mrs. Brown$_1$ had no idea.

So it is not generally possible for antecedents of NCA to give rise to variable binding. This difference will fall out from the account given below.

2.3. Summary

The data introduced so far show that we need a way to account for covarying interpretations of pronouns in CPs without syntactic reconstruction. Moreover, in section 2.1, we saw that this has to be sensitive to the distinction between CPs and DPs. To repeat, whereas variable binding is possible in (42b) without feeding a disjoint-reference effect, this is not true for (42a).

(42) a. *… But [$_{DP}$ the paper that he$_1$ gave to Mrs. Brown$_2$], I don't think she$_2$ would want any student$_1$ to worry about.
  b. … But [$_{CP}$ that he$_1$ gave the wrong answer to Mrs. Brown$_2$], I don't think she$_2$ would want any student$_1$ to believe/worry about.

I have further shown, in section 2.2, that variable binding into left-dislocated clauses is generally possible without reconstruction. We can conclude, then, that there must be derivations that base-generate CPs in a left-dislocated position.[10] This is, of course, part of the account famously offered by Koster (1978) for sentential subjects, and it directly accounts for the absence of Condition C violations. In section 5, I will address the syntactic consequences that follow here. First, however, in order to make good on the proposal, I need to show just how pronouns in base-generated CPs can covary without being reconstructed. Although this requires a long detour into the semantics of clausal arguments, it is important for the overall argument to provide a detailed analysis of this "apparent binding."

3. Covariation in Fronted CPs

To achieve covariation in fronted CPs, I will exploit a more general property of CP arguments—such as the complements of propositional attitude verbs—which is the following: pronouns they contain do not need to be directly bound by their quantificational binders. Rather, they can be bound from *within* the clausal argument. This is perhaps best appreciated by cases of *de se* pronouns, and reviewing these will provide an introduction to the ingredients of the general account for covariation in fronted CPs.

3.1. Background on the Semantics of Complement Clauses

We usually talk about the bound-variable pronoun in (43) as being bound by the quantifier.

(43) No student submitted his paper on time.

When it comes to pronouns in embedded clauses, however, this usual talk is not necessarily appropriate. Argument clauses are typically opaque contexts, and here the semantic issues of binding and coreference differ.

(44) No student thinks he submitted the paper on time.

What we learn from the semantic literature is that the bound-variable interpretation in (44) may not arise from the quantifier *directly* binding the pronoun. Rather, its covarying interpretation arises in a slightly more indirect way. *De se* attitude ascriptions provide the best evidence that what look like pronouns bound by quantifiers actually get their covarying interpretations from a more indirect source. So it is here we will begin. The upshot will be that there need not be a c-command relationship between the quantifier and the pronoun in (44) in order to give rise to the covarying interpretation.

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[10] I leave open for now whether that position can ever be the canonical subject position or must be somewhere higher.

De se attitudes report a belief (desire, hope, etc.) from a first-person perspective (Lewis 1979, Perry 1979). Take Perry's shopper, John, who thinks that the messy trail of food he is following is spilling from the cart of an oblivious shopper who is ahead of him but out of view. Of this person, John would say "This person is a messy shopper. He is rude." Suppose John then realizes that he *himself* is the oblivious messy shopper. He now has a new belief, which he might express to himself as "*I am the one making the mess.*" When it comes to the linguistic expressions that report John's attitudes, we can talk of the attitude ascribed when John is oblivious to his mess as a non–*de se* attitude (about himself). The attitude we ascribe to him after his realization is a *de se* attitude.

(45) a. John thought that he was a rude shopper.   non–*de se* belief
      b. Then John realized that he was the messy shopper.   *de se* belief

It is common to talk of the pronouns in the embedded clauses as being either *de se* or *de re*. I will use the terms *de se* and *non–de se*.[11] What is nonnegotiable about the semantics of *de se* pronouns (Chierchia 1989) is that they are neither bound by nor "coreferential" to the subject of the attitude verb. Rather, the *de se* pronoun refers to the individual the attitude holder takes to be himself, his *de se* counterpart. This notion, following Lewis (1979), is provided by centered propositions. Centred propositions are sets of pairs that consists of an individual and a world. In the case of belief, we have centered doxastic (Dox) alternatives.

(46) Centered doxastic alternatives
    $\mathrm{Dox}(x,w) = \{\langle x', w'\rangle$: it is compatible with what x believes in w that x is x' in $w'\}$

Believe and other attitude verbs express universal quantification (Hintikka 1969) over sets of such pairs. On Chierchia's (1989) proposal, a verb like *believe* takes a property complement (type $\langle e\langle s,t\rangle\rangle$). That property is predicated of the attitude holder's *de se* counterpart in each of her doxastic alternatives.

(47) $[\![\ believe\ ]\!] = \lambda P.\lambda x.\lambda w.\forall \langle x', w'\rangle \in \mathrm{Dox}(\langle x, w\rangle)[P(x')(w')]$

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[11] This is to avoid the direct comparison to the *de re–de dicto* ambiguity. There are certainly pronouns that are neither *de re* nor *de se*.

  (i) John wants to catch a fish. He plans to eat it for supper.

These are perhaps a kind of *de dicto* pronoun, although they are usually described as cases of modal subordination (Roberts 1987). Such cases certainly call for a nonsyntactic account. Clear cases of covariation of a "*de dicto*" pronoun are harder to find (this is modeled after Partee's telescoping example reported in Roberts 1987):

  (ii) Mary dreamt that every candidate crossed the stage. She imagined that he then took his diploma.

These too must call out for a nonsyntactic treatment (D-type pronouns, perhaps).

To derive this property from a complement proposition, Chierchia (1989) suggests that the complementizer houses a lambda binder that opens up the clause by abstracting over the pronoun.[12]

(48) $[\![[_{CP} \, C_{\lambda x} \, [he_x \text{ is messy}]]]\!]$
$= \lambda x.\lambda w.\text{messy}(x)(w)$

A *de se* report with a quantified attitude holder is formulated here. (Throughout, I often give formulas using w_0 as the evaluation world.)

(49) $[\![\text{Every shopper}_1 \text{ believes that he}_1 \text{ is messy}]\!]$
$= \forall x[\text{shopper}(x)(w_0) \rightarrow \forall \langle x', w' \rangle \in \text{Dox}(\langle x, w_0 \rangle)[\text{messy}(x')(w')]]$
$\approx$ Every shopper in the actual world w_0 believes in w_0 that his *de se* counterpart is messy.

The crucial piece to note is that the pronoun is not bound by the quantifier. For a subset of cases, it is now relatively easy to see how to get covariation without actually putting the pronoun in the c-command domain of the quantifier. For instance, the following can report a *de se* belief of *every shopper*.

(50) That he$_1$ is messy, every shopper$_1$ believes.

The topic CP (CP$_{TOP}$) is base-generated in its surface position, say adjoined to the matrix clause (CP$_{MA}$). Following Koster (1978) and Alrenga (2005), sentential topics are connected with the gap position by a null operator.[13] This null operator ranges over property-type variables/traces. I give (50) the representation in (51).

(51) CP$_{MA}$: every shopper believes [that$_{\lambda x}$ he$_x$ is messy]

CP$_{TOP}$ CP$_{MA}$: λP.every shopper believes P

that$_{\lambda x}$ he$_x$ is messy OP$_P$ C$'_{MA}$

every shopper believes t_P
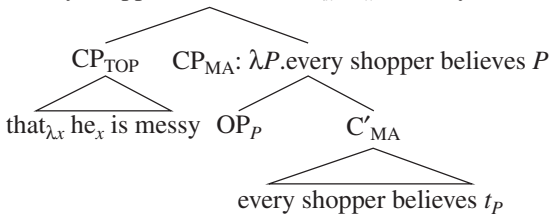
CP$_{TOP}$ is simply lambda'd into the object position and the result is equivalent to (49):

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[12] This is not to say that this is the definitive way to get *de se* pronouns, but it suffices for the present purposes. Those systems needed to handle more complex cases (see Percus & Sauerland 2003, Anand 2006) should carry over to the present account of pronouns in embedded contexts. The crucial component is that *de se* pronouns are bound from within their complements.

[13] Various factors, such as island sensitivity, motivate the null-operator analysis. See Alrenga 2005 for a review of evidence.

(52) $[\![[[\text{That he is messy}][\lambda P.\text{every shopper believes } P]]]\!]$
       $= \forall x[\text{shopper}(x)(w_0) \rightarrow \forall\langle x', w'\rangle \in \text{Dox}(\langle x, w_0\rangle)[\text{messy}(x')(w')]]$
       $\approx$ Every shopper in the actual world w_0 believes in w_0 that his *de se* counterpart
       is messy.

Covariation comes for free from the interpretation of *de se* pronouns. With these basic
tools in hand, next we turn to how this approach can more generally allow for binding
into fronted clauses.

3.2. *Generalized Binding by C*

Not all pronouns that covary in fronted CPs are *de se*. In the following examples, we
are reporting the attitudes of *any boy*'s mother, not *any boy*, and so the pronoun
cannot be *de se*.

(53)   a.   … But that he$_1$ is too old for Mrs. Brown$_2$, I don't think she$_2$ would want
             any boy$_1$'s mother to believe.
       b.   That he$_1$ is in trouble, I don't think any boy$_1$'s mother has a clue.

We know that syntactic reconstruction is not responsible for the covarying
interpretations of the pronouns in either case: (53a) bleeds condition C, and so the
CP must be base-generated higher than the quantifier; and (53b) is an example where
the gap position is occupied by a null complement anaphor, hence no movement of
the CP, either.

   Pronouns such as these also involve indirect binding even though they are not *de
se*. I argue that there is a hidden argument of the embedding predicate. This argument
can be overtly expressed in a PP as a "proleptic" object:

(54)   a.   … But that he$_1$ is too old for Mrs. Brown$_2$, I don't think she would want any
             boy$_1$'s mother to believe **about him**$_1$.
       b.   That he$_1$ is in trouble, I don't think any boy$_1$'s mother$_1$ has heard a rumor
             about him$_1$.

Proleptic objects can express what is called the *res* argument of attitude ascriptions
(Quine 1956, Cresswell & von Stechow 1982). The *res* argument is interpreted as the
the external object that the attitude is *de re* of.

(55)   a.   They say *of John* that he is in trouble.
       b.   What we suspected *about Mary* was that she would leave early.
       c.   The only thing we know *about this guy* is that someone's been bothering
             him.

Following Quine (1956) and Kaplan (1968), and adopting in part formalizations
in Stechow 1982 among others, I construe a *de re* attitude as a three-place

predicate with the following arguments: the attitude holder subject (x), a res argument (y), and a property argument (*P*).[14] The verb *believe* is given here:[15]

(56) *De re believe*
$$[\![believe]\!] = \lambda P.\lambda y.\lambda x.\lambda w.\forall \langle x', w' \rangle \in \text{Dox}(\langle x, w \rangle)[P(y)(w')]$$
$\approx x$ believes *P de re* of *y* (in *w*)

In support of this view of *de re* belief, we note that the clausal complement often contains a pronoun that corresponds to the *res* (Landau 2009).[16]

(57) a. We thought about John that something terrible had happened *(to him).
  b. *We believed about Mary that there's nothing hard work and good faith can't solve. (Landau 2009:(6))

(58) a. John believed of the building that there was something in it.
  b. *John believed of the building that there was someone trapped inside.

(59) a. What I suspected about the cake was that someone ate it.
  b. *What I suspected about the cake was that someone ate.

(60) a. We believed about John that he was too old for Mrs. Brown.
  b. *We believed about John that Mrs. Brown would be too old.

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[14] Whether the DP in the PP *is* the *res* argument itself or whether the PP spells it out in some indirect way (much as a *by*-phrase spells out agents in passives) is an interesting question. Although I implement an analysis that treats the preposition as semantically vacuous and lets its DP complement saturate the *res* argument of the verb directly, alternatives could be accommodated while achieving the results about binding reported here.

[15] Two points: How the *de se* and *de re* denotations of *believe* are related is left unanswered; so is the question of whether a purely *de dicto believe* needs to be given as well. Second, (56) hides a crucial semantic component of *de re* belief. To define *de re* attitudes, we need the more sufficient formulation in (i), which requires that a suitable "Acquaintance Relation" hold between the subject and the *res* (Lewis 1979).

(i) a. $[\![believe(P)(y)(x)(w)]\!]=1$ iff
  b. $\exists$ R such that $R(y)(x)(w)$
  c. R is a suitable Acquaintance Relation
  d. $\forall \langle x', w' \rangle \in \text{Dox}(x, w)[P(\imath z.R(x')(z)(w'))(w')]$

With that in mind, (56) is a shorthand usable for our purposes.

[16] This is not always true, as pointed out by one reviewer, who offers the following sentences culled from the internet:

(i) a. The myth about outsourcing is that you lose control.
  b. The fear about encryption is that people are shut off from access to information.
  c. My personal belief about dentistry is that everyone deserves the best quality care possible.

Proleptic objects may take in a larger set of roles than that of a *res* argument. All that is crucial at this point is the existence argument: pronouns *can* be associated with overt expressions of the *res* arguments as in (57)–(60).

This requirement is consistent with the analysis of *de re* attitudes given above, assuming that deriving the property complement involves abstracting over the pronoun. Suppose that the complementizer performs this function just as with *de se* pronouns.[17] An example is given here:

(61) $[\![_{CP}\ C_{\lambda x}\ [he_x\ \text{is too old for Mrs. Brown}]]\!]$
  $= \lambda x.\lambda w.\text{too-old-for-Mrs.Brown}(x)(w)$

The *res* can be a quantifier. Such a case is interpreted as follows:

(62) a. We believed about every boy$_1$ that he$_1$ was too old for Mrs. Brown.
  b. $\forall y[\text{boy}(y)(w_0) \rightarrow \forall \langle x', w' \rangle \in \text{Dox}(we)(w_0)[\text{too-old-for-Mrs.Brown}(y)(w')]]$

And the *res* can be bound by a quantifier. Such a case is interpreted as follows:

(63) a. Every boy$_1$'s father believed about him$_1$ that he$_1$ was too old for Mrs. Brown.
  b. $\forall x[\text{boy}(x)(w_0) \rightarrow \forall \langle x', w' \rangle \in \text{Dox}(x's\text{father})(w_0)[\text{too-old-for-Mrs.Brown}(x)(w')]]$

We now can apply this same strategy to the cases in (53), where the *res* argument is not pronounced. We understand (64) as having the structure in (65), where null *pro* is the *res*.

(64) … But that he$_1$ is too old for Mrs. Brown$_2$, I don't think she would want any boy$_1$'s father to believe.

(65) … But that he$_1$ is too old for Mrs. Brown$_2$, I don't think she would want any boy$_1$'s father to believe **pro$_1$**.

The *res* is itself bound by the possessor of the subject of *believe*.[18] Just as with *de se*–construed pronouns, the location of the clausal argument—a property—does not matter. As before, the topic CP is base-generated high and linked to its argument position by a null operator, which will derive the absence of a condition C effect. The following tree shows the derivation of the matrix clause in (65) without the topic CP. (In order to keep the representation legible, only the relevant embedded clause of (65) is shown.)

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[17] This is by no means to suggests that *de re* construals of nouns, or transparent interpretations in general, are subject to binding by C in this way. *De re* construals/transparent interpretations of whole DPs are not subsumed under this approach.

[18] A theory of binding out of DP in this way, is of course, needed. See Büring 2004.

(66) a. (That he is too old for Mrs. Brown) everyboy's father believes.

b. $\lambda P.\lambda w.\forall x[\text{boy}(x)(w) \rightarrow \text{believe}(P)(pro_x)(x\text{'s father})(w)]$
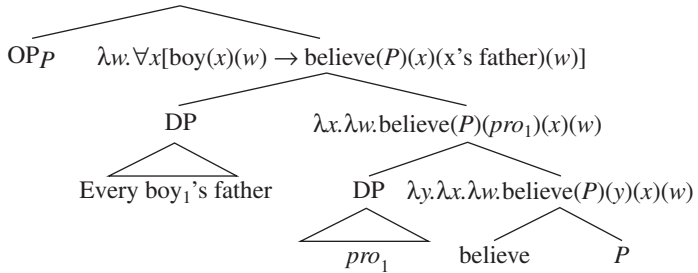
The matrix clause then combines with the topic CP (see (61)):

(67) a. $\lambda w.\forall x[\text{boy}(x)(w) \rightarrow \forall w' \in \text{Dox}(\langle x\text{'s father}, w\rangle)[\text{too-old-for-Mrs. Brown}(pro_x)$
$(w')]]$

b. $\approx$ Every boy x's father believes in w *de re* of x that x has the property of being too old for Mrs. Brown.

Covariation is achieved indirectly. The pronoun in the topic clause is bound by a binder within the fronted CP; it merely serves to create a property. It is the *res* argument that is bound by the quantifier.[19] I turn next to accounting for the cases of null complement anaphora introduced in section 2.2.

3.3. Analysis of Null Complement Anaphor Cases

Recall the cases of apparent binding into the left-dislocated CPs:

(68) a. That he$_1$ was in danger, no boy$_1$ had any clue.

b. That he$_1$ was putting the entire economy at risk, I don't think any stock broker$_1$ was aware.

c. That she$_1$ was being intimidated, I don't think any doctor$_1$ had any suspicion.

d. That he$_1$ lost, every boy$_1$ had some idea.

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[19] Stechow (1982) and Heim (1998:220) show that in a system like that used here we will have to accommodate multiple *res* arguments. I predict, then, that we should allow multiple bound pronouns in the topic CP without syntactic reconstruction. This prediction is borne out (note the use of an NCA example in (ib), which precludes a reconstruction analysis).

(i) a. That she$_1$ would agree to marry him$_2$, I don't think any boy$_2$'s parents expected of any girl$_1$.

b. That she$_1$ would agree to marry him$_2$, I don't think any boy$_2$'s parents had a clue about any girl$_1$.

The semantics of *de re* attitudes will need to be suitably extended to cover multiple *res* arguments. See Heim 1998 and Anand 2006 for a recent discussion.

We discovered in section 2.2. that these gaps had the distribution of null complement anaphors, not the distribution of the traces of CPs or DP null operators. The semantic relationship between the CP and the null complement anaphor position still needs to be elucidated. Unlike the usual dependency between a null complement anaphor and its (nontopicalized) antecedent, the constructions under investigation here are constrained by islands. In the (a) examples, root clauses successfully antecede a null complement anaphor across various islands. The (b) examples show that a topicalized CP cannot be related to a NCA across islands.

(69) *Wh*-island
    a.   There is a storm coming. So we should go and find out which people don't know yet.
    b.   *That there is a storm coming, we should go and find out which people don't know yet.

(70) Subject island
    a.   There was a storm coming, and the people who had any clue whatsoever had all left.
    b.   *That there was a storm coming, the people who had any clue whatsoever had all left.

(71) Complex-NP island
    a.   There was a storm coming, but I met lost of people who didn't have a clue.
    b.   *That there was a storm coming, I met lots of people who didn't have a clue.

Left-dislocated CPs related to null complement anaphors show island effects just as left-dislocated CPs associated with DP gaps. In the case of the DP-related CPs, I followed Alrenga (2005) and Koster (1978) in positing a null operator, which moves and gives rise to the island effects (Chomsky 1977). In the NCA cases, it must be the null complement anaphor that moves, and this induces the island violations. Although moved null complement anaphors have hitherto been unknown to my knowledge, their existence parallels overt anaphors that can appear in left-dislocation structures (CLD structures; see fn. 5).

(72) a.   That he was in danger, *that* no boy would ever believe.
    b.   That he was in danger, *NCA* no boy had a clue.

And, as I noted in section 2.1, the presence of such dislocated resumptive pronouns does not affect the binding possibilities—in particular, the ability of fronted CPs to obviate reconstruction conflicts. Example (73) is repeated from (15).

(73) … But that he_1 might be too old for Mrs. $Brown_2$, *that* I don't think she_2 would want any man_1 to believe.

The semantic composition of CLD constructions must be sufficiently similar to topicalization structures without the moved pronoun. That is, the matrix clause denotes a property, an abstract created by movement of the resumptive pronoun.

(74) That he_1 might be too old for Mrs. $Brown_2$, that I don't think she_2 would want any man_1 to believe *t*.
[$That_{\lambda 1}$ he_1 might be too old for Mrs. $Brown_2$]$_{\langle e,st \rangle}$, $\lambda P_{\langle e,st \rangle}$ I don't think she_2 would want any man_1 to believe *P*.

I propose that null complement anaphors can do the same thing, moving to create an abstraction over the object position.

(75) That he_1 might be in danger, NCA no boy_1 had a clue *t*.
[$That_{\lambda 1}$ he_1 might be in danger]$_{\langle e,st \rangle}$ $\lambda P_{\langle e,st \rangle}$ no boy_1 had a clue *P*.

Again the semantics of *de re* and *de se* attitude ascription will derive the covariation. The nouns and adjectives that independently license NCA do, like the attitude verbs we looked at, show evidence of having overt *res* arguments:

(76) I had no clue/idea *about any boy* that he was in danger.

The *res* allows for covariation even if the *res* is not expressed overtly in PP.

(77) No boy_1's mother had any clue/idea (about him_1) that he_1 was in danger.

And note that when the CP is in topic position, the overt res is somewhat possible:[20]

(78) ?That he_1 was in danger, no boy_1's mother had any clue/idea (about him).

In sum, like overt pronouns that serve to create topicalization structures of the CLD sort, null complement anaphors can too. We have thus resolved the puzzle posed by the topicalization structures with non DP gaps: they involve null complement anaphors that move. And, further more, with the strategies for binding in intensional contexts reviewed in this paper, we see why covariation is possible without syntactic reconstruction. Before turning to the predictions of the

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[20] A reviewer points out, however, that in other NCA cases, overt expression of the *res* argument is not at all permitted. Take an uncontroversial case of NCA with *know*:

(i) John was once arrested for possession. Did you know …	
(i) Yeah, I know that about him.	Pronoun + *res*
(i) Yeah I know.	NCA
(i) *Yeah I know about him.	NCA + *res*

This is, independently of the present claims, a genuine and interesting mystery that I must leave for future research. Certainly the semantics of these constructions requires *res* arguments (Kratzer 2002).

account, one more matter concerning reconstruction effects needs addressing: NPIs.

3.4. NPI Licensing

We have seen evidence that clauses need not undergo syntactic reconstruction to give pronouns bound-variable interpretations. The licensing of negative polarity items (NPIs) is, of course, another common test for reconstruction. And, just as with the binding data, the surface facts make it appear as though CPs reconstruct. The NPIs *anyone* and *ever* are licensed in left-dislocated CPs below, in just those cases where the gap associated with the CP is in the scope of negation.

(79) a.   That anyone would take offense, I did not expect.
     b. *That anyone would take offense, I expected.

(80) a.   That he had ever been to France, (that) I did know.
     b. *That he had ever been to France, (that) I knew.

Moreover, as pointed out by a reviewer, NPIs are licensed even inside those CPs that are related to an NCA gap (see sect. 2.2).

(81) a.   But that anyone would take offense, I had no clue.
     b. *But that anyone would take offense, I was sure.

(82) a.   But that John had ever been arrested, none of us were aware.
     b. *But that John had ever been arrested, we were all aware.

Recall that these CPs are not related to such gaps by movement of the CP, which precludes syntactic reconstruction. Nonetheless, the NPIs are licensed by a lower negation. The question to ask at this point is whether NPI licensing requires syntactic reconstruction. If not, these data do not constitute counterevidence.

In the most basic cases, NPI licensing is subject to a surface c-command requirement (Ladusaw 1979):

(83) a.   Phil did not give anything to me.
     b. *Anything was not given to me.

Clearly, though, the surface constraint does not apply in the cases of fronted CPs. But data like these have long been known. That is, are certain cases where surface c-command is not required—specifically, cases where the NPI is contained in phrase that itself is interpreted in the scope of the (lower) negation. Swart (1998) collects some relevant cases. Note particularly Ross's example in (84a), the earliest instance of the relevant data point with fronted CPs:

(84) a. That he had stolen anything was never proved.

(Ross 1967)

    b. A doctor who knew anything about acupuncture was not available.

(Linebarger 1980)

    c. An article with any convincing examples of NPIs in subject relative clauses has never appeared in any linguistics journal so far. (Attributed to Partee)

One view (see Swart 1998) is that NPIs need only be in the semantic scope of the licensor, which need not require syntactic reconstruction. This is exactly what the analysis proposed here does: it puts the fronted CP in the scope of the licensing negation semantically via a null operator. Now, it remains an open question as to whether NPI licensing also requires *syntactic* reconstruction (see Hoeksema 2000 for a recent discussion). That syntactic reconstruction is not alone sufficient is demonstrated by (83). The question is whether it is necessary. Although this a larger issue than can be addressed within the scope of this paper, some initial probing suggests that syntactic reconstruction is not necessary for NPI licensing. My strategy, once again, is to create a "reconstruction" conflict of the Lebeaux–Fox–Romero sort —pitting NPI licensing against condition C. The following examples contrast cases where an NPI requires licensing (the (a) cases) and those where it does not (the (b) cases). In both, a referring expression is contained in the fronted CP. Nonetheless, there appears to be no difference: no disjoint-reference effect is detected, regardless of the presence of an NPI.

(85) a. That anyone would take offense to the reporter$_1$'s comments, he$_1$ never expected.

    b. That people wold take offense to the reporter$_1$'s comments, he$_1$ never expected.

(86) a. That John$_1$ would ever lose a race, he$_1$ never expected.

    b. That John$_1$ would lose a race, he$_1$ never expected.

I conclude, then, that in the case of fronted CPs, NPIs are licensed without syntactic reconstruction. This further supports the view that NPI licensing requires merely semantic reconstruction.

   In the next section, some positive predictions of the analyses are shown to be borne out.

4. Predictions: No *Res*, No Covariation

One of the clearest predictions of this analysis is that in cases where a *res* argument is not available, fronted CPs will not show exceptional binding behavior. I will show two cases where this is borne out. The first case involves clausal complements of nouns. The second, some interesting asymmetries between the *de re* attitude ascriptions and psych constructions.

4.1. Predictions for the Complements of Nouns

Certain nouns, like *idea*, *rumor*, and *belief*, can take *res* arguments:

(87) a. The belief about John that he is crazy …
      b. The suspicion about John that he stole the car …
      c. Any rumor about Mary that she has escaped …

We might expect, then, that the semantic mechanisms that deliver covariation via *res* arguments in the verbal domain will apply for complements to nouns as well. That this is true is demonstrated by the following:

(88) a. … But the idea/claim/notion/suspicion that he$_1$ might be too old for Mrs. Brown$_2$, I don't think she$_2$ would want any man$_1$ to believe.
      b. … But the idea/claim/notion/suspicion that he$_1$ might be too old for Mrs. Brown$_2$, I don't think any man$_1$ would want her$_1$ to believe.

Just as with sentential topics, the fronted DP in (88a) allows covariation for the pronoun and yet no disjoint-reference effect is observed. Example (88b) is a control case for which we would not expect a reconstruction conflict in any case. Two more controls are necessary to establish the conclusion that (88a) shows no sign of a reconstruction conflict. First, when the noun and its complement are in situ, we find a disjoint-reference effect for both of the sentences in (88):

(89) a. *I don't think she$_2$ would want any man$_1$ to believe the idea/claim/notion/ suspicion that he$_1$ might be too old for Mrs. Brown$_2$.
      b. *I don't think any man$_1$ would want her$_1$ to believe the idea/claim/notion/ ssuspicion that he$_1$ might be too old for Mrs. Brown$_2$.

Further, (88a) contrasts with those sentences originally developed by Lebeaux (1991) and Fox (1999), which do show a reconstruction conflict. A near-minimal pair is given, comparing a head noun like *idea* with a noun like *article*.

(90) a. … But the idea that he$_1$ might be too old for Mrs. Brown$_2$, I don't think she$_2$ would want any man$_1$ to believe.
      b. *… But the article that he$_1$ read for Mrs. Brown$_2$, I don't think she$_2$ would want any man$_1$ to believe.

The difference, I suggest, is that nouns like *idea*, but not *article*, have *res* arguments that can be marshaled to mimic binding in just the way suggested for verbs. There are several ingredients that we need in order to flesh out an analysis of the contrast in (90a,b). One is an analysis of the *res* argument of nouns like *idea*. Another is a semantics for the complement clause of such nouns. Together, these pieces will allow us to get covariation without reconstruction. Finally, it is necessary to account for the absence of a condition C violation in (88a) and (90a). Although reports in the literature vary, it turns out that CP complements to nouns can bleed condition C.

4.1.1 *Clausal complements of nouns late merge*

There is an asymmetry between arguments and modifiers in their sensitivity to connectivity effects (Riemsdijk & Williams 1981, Freidin 1986). When a referring expression is contained in an argument of a moved expression, reconstruction gives rise to a disjoint-reference effect. If the referring expression is contained in a modifier, however, the disjoint-reference effect is lifted.

(91) a. *Which investigation of Nixon$_1$ did he$_1$ resent?   Argument
      b.   Which investigation near Nixon's$_1$ house did he$_1$ resent?   Modifier

(92) a. *Which book about John's$_1$ library did he$_1$ read?   Argument
      b.   Which book from John's$_1$ library did he$_1$ read?   Modifier
                                      (Fox & Nissenbaum 1999:6, (6))

Freidin (1986) and Lebeaux (1988) claim that the same asymmetry distinguishes clausal complements from relative clauses, the former patterning with arguments in feeding condition C (judgments are those from this literature).

(93) a. *Which claim that Mary had offended John$_1$ did he$_1$ repeat?
      b.   Which claim that offended John$_1$ did he$_1$ repeat?

Notoriously, though, these sentences are confounded by a number of interfering factors.[21] Perfectly good examples of complement clauses obviating condition C can be constructed (Lasnik 1998, McCarthy 2003, Kuno 2004). Several well-controlled examples from Kuno are reported in (94).

(94) a. The fact that John$_1$ has been arrested he$_1$ generally fails to mention.
      b. Whose allegation that Lee$_1$ was less than truthful did he$_1$ refute vehemently?
      c. Which psychiatrist's view that John$_1$ was schizophrenic did he$_1$ try to get
         expunged from the trial records?   (Kuno 2004:335, (72))

Clausal complements to nouns must be able to late merge, given their clear ability to bleed condition C. Current assumptions about late merger (see Fox 2002) is that its application is regulated by the semantics. Late-mergeable items are those phrases that can be in some copies but not in others, and that is not something that is possible of arguments. So, the clausal complements of nouns must not be arguments.

  Stowell (1981), in fact, already proposed that CP complements of nouns are not true arguments but phrases in apposition. And our intuitions about the semantics of

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[21] Among the factors that confound the early examples are: (i) problems associated with using proper names to refer to the attitude holder from her own perspective in attitude reports (Kuno 2004), and (ii) the fact that *which* in (93) requires individuating claims with the same content, something that is difficult in the first place as shown by the oddness of the sentence without any condition C violation (Jacobson 2004:n. 10).

(i) a. ??Which claim that Mary had offended him did he repeat?
    b. ?Whose claim/which of the claims that Mary had offended him did he repeat?

Chomsky (1995:216, n. 44) points out that topicalized CPs are more natural, perhaps for just these reasons.

the relationship between a noun and its CP complement, as in (95), suggest the same thing: the complement identifies the content of the head noun:

(95) a. the rumor that Mary offended him
    b. the claim that he offended Mary

Higgins (1972) and Stowell (1981) supported this intuition by noting that when these CPs appear in postcopular position they explicitly identify the content of the noun:[22,23]

(96) a. The rumor that Edna was stealing (is false).
    b. The rumor is that Edna was stealing.

(97) a. The fact that Edna was stealing (is apparent).
    b. The fact is that Edna was stealing.

(98) a. The belief that Edna was stealing (is false).
    b. The belief is that Edna was stealing.

(99) a. Andrea's guess that Bill was lying
    b. Andrea's guess was that Bill was lying.

(100) a. John's claim that he would go
    b. John's claim was that he would go.

(101) a. Paul's explanation that he was temporarily insane
    b. Paul's explanation was that he was temporarily insane.

<div align="right">(Stowell 1981:199, (154))</div>

As Grimshaw (1990) shows, true arguments cannot be separated from their governing nouns like this, across a copula. To make this point, Grimshaw contrasts genitives in two roles. In (102), the genitive is possessive (hence, in Grimshaw's system, a modifier). It can be in the postcopular position.

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[22] The copular relation here is specificational—or "equative" as Potts (2002) terms it—not predicational. And this same specificational relation can be detected in the complex nominal cases. This suggests that CPs identify the (content of) the nouns in both kinds of constructions.

[23] There are several apparent counterexamples to this claim. One is nouns like *proof*, which are taken up in footnote 26. Another counterexample involves the noun *knowledge*, which Grimshaw (1990) claims does not allow the CP in postcopular position:

  (i) *The knowledge was that Dukakis was ahead.   (Grimshaw 1990:98, (122a))

Some naturally occurring examples, however, suggest that *knowledge* is not a counterexample:

  (ii) a. Our current knowledge is that light exhibits a dual nature or behavior.
      b. My limited knowledge of returning missionaries was that they were basically hands off until they were "debriefed"; is this unusual?
      c. My only knowledge of it was that there was an image of it on a punt coin at some stage. The first thing that struck me was how modern it was.

(102) a. John's dog
     b. The dog is John's.   (Grimshaw 1990:97, (118a))

The genitive in (103), on the other hand, is an argument—this construction being a passive nominal. This genitive cannot occur in postcopular position.

(103) a.   The building's construction
     b. *The construction was the building's.   (Grimshaw 1990:97, (121b))

We conclude, then, that arguments cannot appear in postcopular position. Because clausal complements of nouns *can* appear in postcopular position, they are not arguments.

   The fact that the relationship between the noun and CP is not a predicate–argument one is further demonstrated by properties of those nouns derived from verbs, as shown in (98)–(101). Nouns like *guess, claim, belief*, and *explanation* denote just what their objects do (Stowell 1981). That is, they are not event nominals but are rather "object nominals."[24] Grimshaw (1990) argues that object nominals do not take arguments and so concludes that CP complements of nouns are not syntactic arguments. In fact, there is a simple way to demonstrate that Grimshaw's suggestion is correct for object nominals. Nouns can, in general, take DP arguments as long as case is made available, with *of*. This can be seen for deverbal nouns in (104) and relational nouns in (105):

(104) a. John's repetition of his claim
     b. the Romans' destruction of the city

(105) a. The niece of one of my friends (is nice).
     b. The capital of Wisconsin (is a friendly place).

It is not possible, however, to replace the CP complements of nouns with a DP—even with the help of a preposition. This is true for nonderived nouns, as in (106a).[25]

(106) a. *I don't believe the idea, story, notion, theory, scoop, myth of that.
     b. I don't believe the idea, story, notion, theory, scoop, myth that Edna left.

And it is true of many derived nominals: the verbs in (107)–(109) take DP internal arguments but their object nominalizations cannot.

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[24] Grimshaw (1990) distinguishes between complex event nominals and result and simplex event nominals, the latter two not taking arguments syntactically. I prefer the term "object nominal" for these cases because it makes clearer what the noun denotes in relation to the verb.

[25] To the extent that speakers allow such PPs to surface, the DPs inside them do not correspond to the propositional argument of the predicate but often the *res* as shown here:

 (i) The myth/claim/story of that/his birth/that event is that it was a hoax.

(107) a. *John's belief of that idea
      b.   John believed that idea.

(108) a. *John's claim of something
      b.   John claimed something.

(109) a. *Her thought of that
      b.   She thought that.

Object nominals are not internal argument-takers because they denote the same thing that their internal argument does.[26]

It is worthwhile to sketch what the relationship between the noun and CP is in order to flesh out our understanding of the bleeding of condition C. Following a proposal in Kratzer 2006, pursued in Moulton 2009, we can think of CPs as predicates that identify the content of some noun. As a first step, Kratzer treats nouns like *rumor* and derived nouns like *belief* as properties of individuals that have propositional content.

(110) a. $[\![rumor]\!] = \lambda x.\lambda w.\text{rumor}(x)(w)$
      b. $[\![belief]\!] = \lambda x.\lambda w.\text{belief}(x)(w)$

Second, we define a function that allows us to talk about the content of a particular rumor or belief as a set of possible worlds compatible with these information-bearing individuals.

(111) $\text{fcont}(x)(w) = \{w' : w' \text{ is compatible with } x \text{ in } w\}$

The next step in Kratzer's proposal captures how the CP complement identifies the content of these nouns. Kratzer proposes that a functional head, say a complementizer, does this job. This head, Comp,[27] has a propositional argument (type <s,t>), an individual argument (x) that is something that has propositional content, and the usual world argument.

(112) $[\![\text{Comp}]\!] = \lambda p.\lambda x.\lambda w[\text{fcont}(x)(w)=p]$ (After Kratzer 2006)
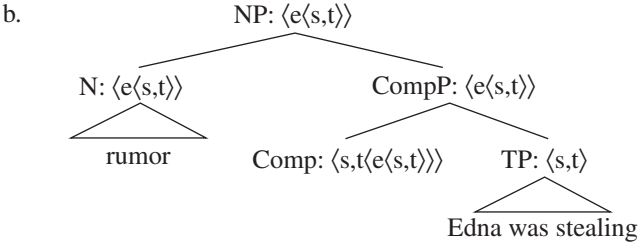
---

[26] Note that we are forced to conclude that verbs like *believe* can *only* form object nominals. Why this is true remains a mystery. The nominalization of *prove* is often cited as a counterexample to the claim that CP complements of nouns are not arguments, given the inability of the CP to appear in the postcopular position (ia). What goes wrong here, however, has nothing to do with the status of CP Complement but merely that *proof* is a "subject" nominal. It is the thing that does the proving that can be identified with the noun *proof*, not the conclusion (ib).

   (i) That John's coat is gone proves that he left.
       a. $\neq$ The proof is that he left.
       b. $\approx$ The proof is that John's coat is gone.
[27] I will remain agnostic as to whether Comp is the complementizer *that* or some other functional head.

Comp says that the content of some individual is the proposition that Comp embeds. This accords with our intuitions that in (113a) the content of the rumor is just the proposition that Edna was stealing.[28] The composition is given here. The way that the CP combines with the noun is by predication modification.

(113)   a.   rumor that Edna was stealing
        b.

NP: $\langle e\langle s,t\rangle\rangle$

N: $\langle e\langle s,t\rangle\rangle$ CompP: $\langle e\langle s,t\rangle\rangle$

rumor   Comp: $\langle s,t\langle e\langle s,t\rangle\rangle\rangle$ TP: $\langle s,t\rangle$

Edna was stealing

(114)   a. $[\![TP]\!] = \lambda w'.\text{stealing}(\text{Edna})(w')$
        b. $[\![CompP]\!] = \lambda x.\lambda w[\text{fcont}(x)(w) = \lambda w'.\text{stealing}(\text{Edna})(w')]$
        c. $[\![N]\!] = \lambda x.\lambda w.\text{rumor}(x)(w)$
        d. $[\![NP]\!] = \lambda x.\lambda w[\text{rumor}(x)(w) \,\&\, [\text{fcont}(x)(w) = \lambda w'.\text{stealing}(\text{Edna})(w')]]$

What is crucial about Kratzer's proposal for my purposes is that the CP and the head noun are put together by predicate modification. Modification does not affect the semantic type of the noun (something that is not true of a predicate and its argument combined by, say, functional application) and this means that in a movement scenario, there can be a copy of a noun with a CP complement and one without and the composition can proceed successfully. This allows us to late merge the CP in (115) to the higher copy, which explains the bleeding of condition C.

(115)   Which psychiatrist's view that John₁ was schizophrenic did he₁ try to get expunged from the trial records?
        a.   Merge of *wh*-phrase: he₁ try to get ⟨which psychiatrist's view⟩ expunged
        b.   Movement of *wh*-phrase leaving a copy: ⟨Which psychiatrist's view⟩ did he₁ try to get ⟨which psychiatrist's view⟩ expunged
        c.   Late merger of complement CP: ⟨Which psychiatrist's view [that John₁ was schizophrenic]⟩ did he₁ try to get ⟨which psychiatrist's view⟩ expunged

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[28] The content of the noun is identified, uniquely, with the proposition because otherwise we would expect recursive addition of propositions, giving rise to "stacked" CPs after content nouns (which is not possible, and hence why most people have considered them arguments). The present formulation requires that the content of noun *is* the associated proposition, which ensures that further adjoined propositions would be identified with any other proposition. Outside of mathematical statements, for which a possible worlds semantics has difficulty with anyway, this correctly prevents "stacking" CP complements to nouns. That is, *the rumor that Edna was stealing, that Edna left* would identify the two CP propositions, which is impossible, given that they are not the same proposition.

This gets us part of the way to explaining the contrast between fronted nouns in (90), repeated here.[29]

(116) a.   … But the idea that he$_1$ might be too old for Mrs. Brown$_2$, I don't think
         she$_2$ would want any man$_1$ to believe.
    b. *… But the article that he$_1$ read for Mrs. Brown$_2$, I don't think she$_2$ would
         want any man$_1$ to believe.

Now we need to get binding of the variable without syntactic reconstruction. This involves fitting to nouns the solution from the verbal domain that used the *res* argument. We have seen that these nouns have *res* arguments:

(117) a. The rumor about John that he is crazy …
    b. The suspicion about John that he was the murderer …
    c. A belief about Mary that she has escaped …

Rest assured these are *res* arguments: when they are present, the complement clause likes to have an associated pronoun, just as the complements of verbal *de re* attitude ascriptions do (see (57)–(60)).

(118) a.   John's suspicion about the building is that there was something in it.
    b. *John's suspicion about the building is that there was someone trapped.

(119) a.   The rumor about John is that the police were around him.
    b. *The rumor about John is that the police were around.

(120) a.   The belief about John is that he was too old for Mrs. Brown.
    b. *The belief about John is that Mrs. Brown would be too old.

Although it is true that a noun like *article* can combine with a PP that describes what the paper is about, that is not sufficient to count as a *res*: *article* does not take a complement clause.

(121) a.   the article about binding
    b. *the article about binding that it is not syntactic

And this is why, we will see, a head noun like *article* cannot deliver a covarying interpretation for pronouns in a relative clause as in (116b) without syntactic reconstruction.

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[29] A reviewer points out that the clausal complements of verbal gerunds—which do not show any evidence of being nonarguments—should fail to bleed condition C. Here, I use a verbal gerund with an ECM complement (just to be extra sure it is not a nominal gerund).

  (i) a. *Whose believing John$_1$ to be a fool do you think he$_1$ would be most upset by?
     b. *Whose wanting John$_1$ to be hanged do you think he$_1$ would be most upset by?
  (ii) a. Whose belief that John$_1$ is a fool do you think he$_1$ would be most upset by?
     b. Whose desire for John$_1$ to be hanged do you think he$_1$ would be most upset by?

The prediction is that there is a greater disjoint-reference effect in (i) than (ii).

I extend the notion of a *res* argument from attitude verbs to nouns.[30]

(122) $\llbracket rumor \rrbracket = \lambda y_{res}.\lambda x.\lambda w.\text{rumor}(x)(y)(w)$
 $\approx x$ is a rumor about y in w

We must now amend Comp (cf. (112)) so that it accommodates property complements and can combine with nouns that have *res* arguments. A means for doing this is suggested in (123). Comp now has a *res* argument, a property argument, and a "content" argument and requires that the proposition that identifies the content of the argument x is just that proposition formed by applying the property complement to the *res*.

(123) $\llbracket Comp \rrbracket = \lambda P.\lambda y_{res}.\lambda x.\lambda w.\text{fcont}(x)(w) = P(y)$

To see how these pieces come together, consider the following noun phrase with the parse-tree in (124b). I adopt a shell structure for noun phrases, putting the PP argument high, and then head moving the N to a higher nP projection.[31]

(124) a. the rumor about John that he is Canadian
    b.

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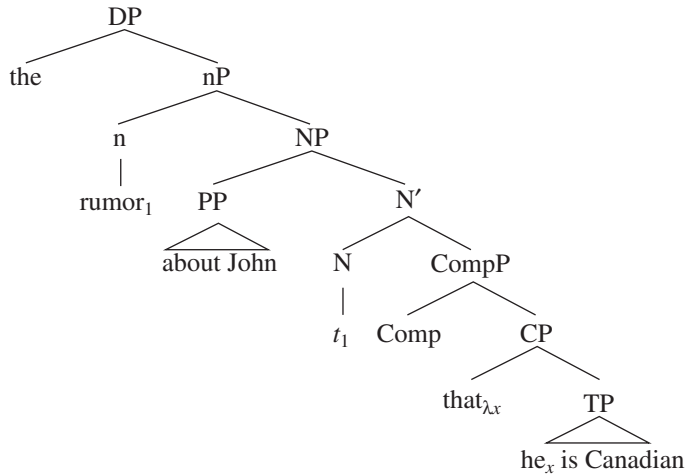
[30] The extension of *res* arguments to nouns is not trivial because of differences between attitude verbs and content nouns. In propositional attitude ascriptions, an attitude holder bears some causal relation to the *res* and has an attitude about the *res* under some description (Kaplan 1968, Lewis 1979) derived from that causal relation. In the case of content nouns, there is not always an attitude holder and there is thereby no "acquaintance relation" to pick out the *res*.

[31] As evidence that this is the location of the PP *about John* in (124b), I note that PP may bind into the complement clause:

  (i) a. I heard a rumor about the victims that each other's testimonies incriminated other suspects.
    b. I had a suspicion about every account that it was fraudulent.

This suggests the structure given in (124b).

CompPs property argument is derived, as with the verbal cases, by abstracting over a pronoun in the complement clause. (I assume a dedicated complementizer for this function, although it could be bundled with Comp itself.) Comp combines with this property complement, delivering:

(125) $[\![\text{CompP}]\!] = \lambda y_{res}.\lambda x.\lambda w[\text{fcont}(x)(w) = [\lambda x.\lambda w'.\text{Canadian}(x)(w')](y)]$

In (126) *rumor* and CompP combine via wholesale predicate modification, which identifies their content arguments (x), *res* arguments (y), and world arguments (w).

(126) $[\![N']\!] = \lambda y_{res}.\lambda x.\lambda w[\text{rumor}(x)(y)(w) \,\&\, [\text{fcont}(x)(w) = \lambda w'.\text{Canadian}(y)(w')]]$

I treat the preposition *about* as contentless (see fn. 14, in which case *John* saturates the *res* argument of N', as in (127a). Apply a definite and evaluate in w_0, and we arrive at (127b).

(127) a. $[\![\text{NP}]\!] = \lambda x.\lambda w[\text{rumor}(x)(\text{John})(w) \,\&\, [\text{fcont}(x)(w) = \lambda w'.\text{Canadian}(\text{John})(w')]]$
   b. $[\![\text{DP}]\!] = \iota x[\text{rumor}(x)(\text{John})(w_0) \,\&\, [\text{fcont}(x)(w_0) = \lambda w'.\text{Canadian}(\text{John})(w')]]$
   c. $\approx$ the unique thing x in the actual world which is a rumor about John and whose content is the proposition that John is Canadian.

And we can get the effect of a covarying interpretation for the pronoun in the complement CP as long as the *res* covaries. The pronoun in (128) serves to create a property that is applied to each contestant about which there was a rumor.

(128) Every contestant$_1$ heard the rumor about himself$_1$ [that$_{\lambda 2}$ he$_2$ won].

We now have all the pieces to get binding into fronted DPs as in (129).

(129) … But the rumor that he$_1$ might be too old for Mrs. Brown$_2$, I don't think she$_2$ would want any man$_1$ to believe.

As with the verbal cases, I countenance a silent *res* argument for *rumor*, which I indicate as the null PP, [P *pro*].

(130) … But the rumor [P *pro*$_1$] that he$_1$ might be too old for Mrs. Brown$_2$, I don't think she$_2$ would want any man$_1$ to believe.

The *res* argument can be present in the lower copy, where *the rumor* merges, and thereby be bound by *any man*. This is followed by movement in (131b) and late merger of the CP complement in (131c).

(131) I don't think she$_2$ would want any man$_1$ to believe [$_{DP}$ the rumor P *pro*$_1$]
    a. Merge of *wh*-phrase: I don't think she$_2$ would want any man$_1$ to believe ⟨the rumor P *pro*$_1$⟩
    b. Movement of *wh*-phrase leaving a copy: ⟨the rumor P *pro*$_1$⟩ I don't think she$_2$ would want any man$_1$ to believe ⟨the rumor P *pro*$_1$⟩
    c. Late merger of Complement CP: ⟨the rumor P *pro*$_1$ [$_{CP}$ that he might be too old for Mrs. Brown$_2$]⟩ I don't think she$_2$ would want any man$_1$ to believe ⟨the rumor P *pro*$_1$⟩

Crucially, the pronoun *he* is not bound by the quantifier *any man* but is abstracted over by the complementizer of its clause. The covariation is of the *res*: for every man there is a rumor about him.[32]

In conclusion, the *res* strategy is not limited to the verbal domain. We can see that it is independently available for nouns with CP complements, and as expected, these CPs do not give rise to reconstruction conflicts, either.

4.2. Psych Constructions

In addition to the contrasts in the nominal domain that track the presence of a *res* argument, there are instances of CP arguments to verbs that do not have *res* arguments. These involve psych constructions. What is unique about psych constructions is that they allow a kind of exceptional binding themselves, as is well known (Belletti & Rizzi 1988). One instance of a psych construction involves sentential subjects of causative verbs with psych predicate complements. As demonstrated in (132), these allow pronouns to covary in the CP by non-(surface-) c-commanding quantifiers (Pesetsky 1995):

(132) a. That her$_1$ paper was accepted made every student$_1$ jubilant.
    b. That he$_1$ has a little crush on Mrs. Brown shouldn't make any boy$_1$ embarrassed.

Although I will not explain the ultimate source of this variable binding (apparent or otherwise), it is possible to use its existence to test the hypothesis advanced in

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[32] A further complication arises in these cases because the higher copy must not contain the bound pronoun, and so we cannot interpret the PP *P pro* in the higher copy. This is not entirely innocuous, because as an argument, that PP should be present in all copies. This issue, however, must be handled in the general case. For instance, in (i) a relative can late-merge (given the bleeding of Condition C) to a noun whose argument (*of his*) must be present only in the lower copy for variable binding.

  (i) Which picture of his$_1$ mother that Mary$_2$ liked best should she$_2$ tell every boy$_1$ to bring to the scrapbook party.

Whatever allows the argument of *picture* to be absent in the higher copy but lets the CP late merge to it should be extended to our *res* arguments. See Sauerland 1998 on some of the issues involved. In the present case, the complication arises because the complement CP of *rumor*, unlike a relative that modifies a noun like *picture*, is of type ⟨e,st⟩, which cannot by itself combine with a determiner if the head noun *rumor* itself is entirely absent in the higher position, which is one way of eliminating the bound pronoun from the higher position.

this paper about binding via *res* arguments.[33] Psych constructions do not have *res* arguments:[34]

(133) a. *That her paper was accepted made every student jubilant about herself.
  b. *That he has a little crush on Mrs. Brown should make any boy's mother embarrassed about him.

For that reason, we do not expect that these constructions will obviate reconstruction conflicts like *de re* CPs did. The following sentences indeed suggest a contrast between these psych constructions (134a) and the kinds of CP complements to *de re* attitude verbs, like *believe*, which we have already seen.

(134) Backward binding vs. *de re* attitudes
  a. *?That he$_1$ has a sad little crush on Mrs. Brown$_2$, I don't think she$_2$ would want to make any boy$_1$'s mother embarrassed.
  b. That he$_1$ has a sad little crush on Mrs. Brown$_2$, I don't think she$_2$ would want to make any boy$_1$'s mother to believe___.

Whereas (134b) successfully allows variable binding and obviates condition C, in (134a) this is difficult. And this is what we expect, given that we cannot use the *res* strategy to get binding into the fronted CP in (134a).[35] Surprisingly, then, psych constructions—which are typically thought to allow a wider set of (nonsyntactic) binding possibilities—are constrained. See Moulton 2011 for more data and a proposal.

4.3. Predictions for Sloppy Interpretations

The analysis makes a further prediction about sloppy interpretations for pronouns in CPs that are arguments of *de se* and *de re* attitude predicates. Given that, on this account, we derive a property-type meaning for the CP—where the pronoun is bound from within the CP—those pronouns should be interpreted sloppily in a wider range of contexts than pronouns in DPs.

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[33] These kinds of backwards binding cases are thought to have a logophoric source (Pollard & Sag 1992, Zribi-Hertz 1989), perhaps relating to the perspective of the psych experiencer. But even if backward binding involves logophoricity, it gives rise to covarying logophors, and that necessarily implicates semantic binding of something at some level. This means the "backward" problem remains.

[34] Although psych constructions and psych predicates often characterize mental states, their nonexperiencer argument is not semantically opaque, unlike the clausal complement of *de re* attitude verbs.

 (i) a. A unicorn made Mary afraid. #But there was no unicorn.
   b. A unicorn scared Mary. #But there was no unicorn.
 (ii) a. That a unicorn would arrive Mary had always expected. (But there was no unicorn, of course.)

[35] The fact the we find reconstruction conflicts with backwards binding in (134a) has an additional implication: it suggests that these covarying readings are achieved by syntactic means. The implication is that these external argument CPs may actually be DPs, and this is what forces a movement analysis.

The relevant environment that tests this prediction is parasitic gaps. The first thing to know about parasitic gaps with DP antecedents is that they do not license "sloppy" readings for anaphora. Haïk showed this with reflexives, as in (135).

(135) Which picture of himself did John destroy after Bill criticized?

The answer to (135) cannot be *Which picture of himself$_1$ did John$_1$ destroy after Bill$_2$ criticized this picture of himself$_2$*. Munn (2001) relates this observation to functional readings of questions (Engdahl 1986, Chierchia 1995). A functional reading of the question in (136) invites the answer below:

(136) Which poem did every poet throw out?
       Her first one.

As such, the poems covary with poets. And a pronoun can be interpreted as bound.

(137) Which of her$_1$ poems did every poet$_1$ throw out?
       Her first one.

A functional reading is not available, however, in a parasitic-gap construction:

(138) Which poem did every poet throw out before her agent read?
       a. Every poet threw out her first poem before her agent could read it.
       b. *Every poet threw out her first poem before her agent read his first poem.

       (Munn 2001:11, (33))

Nor are sloppily interpreted pronouns:

(139) Which poem of hers did every poet throw out before her mother read?
       a. Every poet threw out her first poem before her mother could read it.
       b. *Every poet threw out her first poem before her mother read her first poem.

Similarly, topicalized DPs—to the extent that topicalization structures license parasitic gaps naturally—do not very easily admit of sloppily interpreted pronouns contained in the antecedent to the gaps:[36]

(140) Pictures of her wedding dress you should give Mary only after giving Sue.
       = You should give Mary$_1$ pictures of her$_1$ wedding dress only after giving Sue$_2$ pictures of her$_1$ wedding dress.
       ?≠ You should give Mary$_1$ pictures of her$_1$ wedding dress only after giving Sue$_2$ pictures of her$_2$ wedding dress.

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[36] Because I want to test parasitic-gap constructions with fronted CPs, I need to use the topicalization strategy, since CPs, unlike DPs, do not have *wh*-variants.

In contrast, CPs that license parasitic gaps (see Postal 1994 on the conditions that allow CPs to do this) more easily give rise to sloppy readings for pronouns they contain.[37]

(141) a. That you like her wedding dress, you should tell Mary only after also
         telling Sue.
       b. That he was a sinner, Roger confessed only after Bill confessed.
       c. That he was a crook, I only believed of John after learning of Fred.

To see that this is predicted, take any good account of parasitic gaps (say, Nissenbaum 2000). There will be a null operator that binds two occurrences of a property-type variable.

(142) [That$_{\lambda 1}$ he$_1$ was a sinner] op_2 Roger confessed P$_2$ only after Bill confessed pg_2

The CP antecedent merely denotes the property of being a sinner, and it is understood as the content of what both Bill and Roger confessed about themselves.

4.4. Summary

The empirical contribution of this paper has been the following: "reconstruction conflicts," of the sort diagnosed by Lebeaux (1991) and others, are absent with certain clausal arguments. I took a long detour to provide an explanation for this, which required examining the semantics of clausal arguments, to both nouns and verbs. In the process, I put forth the proposal that covariation of *res* arguments could make it appear as though their associated pronouns in complement CPs were bound. This followed from the mechanisms of *de re* attitude ascription and the formation of property-type complements. We saw, crucially, that this strategy did not necessary distinguish nouns from clauses, but rather it distinguished those kinds of phrases that have *res* arguments from those that do not.

   One of the cautionary tales this paper tells is about the utility of binding diagnostics for reconstruction (and, hence, movement). In attitude contexts,

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[37] I thank an anonymous reviewer for suggesting sloppy readings as a way to test the proposal. The reviewer suggested right-node raising and across-the-board structures:

(i) a. Every Democrat claimed, and every Republican will also argue, that he is the best candidate for
        the job.
     b. Mary believes of no Democrat, and Susan believes of no Republican, that he is the best candidate
        for the job.
(ii) a. That he is the best candidate for the job, every Democrat claimed, and every Republican will also
         argue.
      b. That he is the best candidate for the job, Mary believes of no Democrat, and Susan believes of no
         Republican.

These indeed allow sloppy interpretations, and this is directly predicted by the analysis. However, pronouns in DPs may also allow sloppy reading in these configurations. In particular, Ha (2008) claims that sloppy readings are available in right-node raising of DPs.

variable-binding effects are not reliable. However, the semantic account given here applies to a subset of cases of bound-variable interpretations, those that occur in the complement of *de re* predicates. The clausal arguments in psych constructions showed reconstruction effects that suggested some syntactic constraints on variable binding are necessary, as did the contrasts between nouns with a *de re* attitude semantics and those without (see sect. 4.1).

So I have given an argument, in a way, that syntactic reconstruction is the correct way to account for those cases where these special mechanisms are not at play— namely, those cases that led Fox (1999), Romero (1998), and others to conclude that syntactic reconstruction is needed. Further work is needed to delineate where binding diagnostics are reliable and where they are not.

So far, this discussion has been about reconstruction and the interpretation of pronouns. This was in the service of establishing a syntactic fact: that there are instances in which dislocated clausal arguments do not achieve their surface position by movement. What is yet to be shown however, is that clausal arguments never move. It is to this stronger claim we now turn.

5. Clauses Do Not Move Leftward

Although there must be parses in which clausal arguments are merged only in their surface position, we could imagine that, in the absence of other factors, fronted clauses *could* have moved to their surface position. That is, in principle those sentences where no disjoint-reference effect would arise (see, e.g., (4)) could involve movement.

There is one deciding factor here, however. If clauses *did* have the option of moving, there is still the DP requirement to be accounted for. Recall that the DP Requirement is that left-dislocated clauses leave only DP gaps (see (19)–(23)).[38] I have followed Alrenga (2005) in attributing the DP Requirement to the nature of the null operator. On that story, CPs are base generated high and a DP null operator A' moves to the edge of the matrix clause:

(143)   [That he is too old] Op_1 no man believes t_1

The competing account for the DP Requirement, advanced by a number of authors (Davies & Dubinsky 2002, 2010; Takahashi 2010), argues that CPs that move are embedded in a DP shell, which is why moved CPs show the properties of DPs.

(144) $[_{DP} [_{CP}$ That he is too old$]]_1$ no man believes t_1

[38] Note that the DP Requirement holds of sentential topics just as it does of sentential subjects. This means that the DP Requirement has nothing to do with subjecthood but leftward movement.

This parse is consistent with a subset of the data we have seen so far, because for those cases where no disjoint-reference effect would arise (see (4)), or where the gap is not occupied by a null complement anaphor (see (18)), movement has yet to be ruled out. The question is whether we have reason to believe that both (143) and (144) are available parses. Both these accounts rely on the assumption that CPs cannot themselves move: for the null-operator analysis, it is a DP that goes proxy for the CP that moves; in the DP-shell account, the CP is pulled up by a host DP. The DP-shell account, however, raises an issue that the null-operator analysis does not: the DP analysis of CPs must be constrained so that it is only available when the CP moves. That is, if the DP-shell analysis were generally available to complements then we would predict that CPs in situ might also have the distribution of DPs. The fact that this is false is demonstrated by the the fact that English CPs cannot be objects of prepositions.

(145) a.   I spoke about *(the fact) that he left.
      b.   *There is no indication of that she arrived yet.

Further more, there is a class of verbs, the "*capture* class," whose members select only DPs (146a) and, for many speakers, not CPs (146b) and yet do allow sentential subjects (146c) (Kuno 1973:370, Grimshaw 1982:sect. 4, and Jacobson 1992:284). Members of this class include *express, reflect, capture, bring out, contemplate, attribute*, and *give*.

(146) a.   This formulation of the rule expresses/captures/reflects/brings out the fact that these nouns behave differently.
      b.   *This formulation of the rule expresses/captures/reflects/brings out that these nouns behave differently.
      c.   That these nouns behave differently is expressed/captured/reflected/ brought out by this formulation of the rule.

(Alrenga 2005:184, (30a)–(32a))

If CPs could be embedded in DPs, we would expect a "*capture*" class verb to take a CP wrapped in a covert DP. A recent and well-worked-out proposal for the DP-shell account, Takahashi 2010, has to postulate that the null determiner that heads clauses is one that must move. The null-operator analysis requires no such null determiner, covers the data (crucially, with the proposals for variable binding made in this paper), and it is independently needed (given the NCA cases and bleeding of Condition C).[39]

[39] It may be that CPs that are external arguments are actually part of DP shells. This would be consistent with the facts about reconstruction we saw with psych predicates in section 4.2, where a reconstruction conflict arose. This is consistent with the intuitive semantics: these external arguments can always be paraphrased by DPs:

(i) a. That something happened surprised/amused/annoyed/embarrassed all those people there.
    b. The fact that something happened surprised/amused/annoyed/embarrassed all the people there.

Moreover, as noted in footnote 34, these CPs are never opaque (they refer to facts or events, not propositions). So we might expect their syntax to be more nominal as well.

Both approaches, however, implicate the same thing: CPs do not move leftward.[40] This was an implication of Koster 1978 as well, but it was confounded with his other conclusion about the grammatical function of clauses—that they could not be subjects. These two questions—where clauses sit and whether they move to get there —ought to be separated. However the sentential subject debate is resolved, we now can see that sentential subjects must be base generated. This is because they too fail to exhibit "reconstruction" conflicts predicted of movement:

(147) … But that he$_1$ might be too old for Mary$_2$ didn't appear to her$_2$ to enter any man$_1$'s mind.

If sentential subjects exist, these must be genuinely base-generated subjects.

Why don't clauses move leftward? Most ideas on this issue look to differences between CPs and DPs. Early approaches often tied differences between CPs and DPs to case (e.g., Stowell 1981). Although that might bear on the question of where sentential subjects sit, it cannot explain why clauses cannot move to left-dislocated positions. (In fact, for Stowell, case resistance was what forced CPs to move.) But we have now seen at least one case where something of category CP can move: the null complement anaphors that were anteceded by CPs in topic position as in (148).
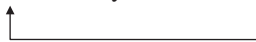
(148) That he was in danger, no boy had a clue.

Recall, that these constructions exhibited island effects. We took this as evidence that the null complement anaphor acted like the overt *that* visible in left-dislocation structures like (149).

(149) That he was in danger, *that* no boy would ever believe *t*.

(150) That he was in danger, *NCA* no boy had a clue *t*.

Furthermore, we know independently that things of category CP can move. The clausal pro-form *so* is one such item, appearing with verbs like *seem*, which do not select DPs (Stowell 1987).

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[40] Whether extraposed CPs are derived by movement is a somewhat different issue. Certainly, extraposed CPs appear low, judging by binding diagnostics:

(i) a. *He$_1$ said to Mary yesterday that someone had sent John$_1$ a letter.
    b. No woman$_1$ told any man$_2$ during their date that she$_1$ approved of his$_2$ haircut.

These facts have inspired antisymmetry-style analyses that derive the rightward position of CPs by the fronting of VP material—stranding the CP in situ (Zwart 1993). So, on these analyses CPs do not rightward, either. Alternatively, the rightward movement of CPs might be seen as a purely PF phenomenon (see, e.g., Truckenbrodt 1995 and Chomsky 2005 for the more general claim that such movements are outside narrow syntax). Either way, the binding facts suggest this movement is different than leftward movement.

(151) a.   It seems so.
  b.   *That seems.
  c.   So it seems.

Additionally, *as* parentheticals have gaps with CP, and not DP, distribution. Postal (1994:72) shows that *as*-clause extraction is grammatical with verbs like *boast* and *comment*. The verbs do not allow DP objects but rather CP complements.

(152) a.   Albert boasted/commented/complained that the results were fantastic.
  b.   *Albert boasted/commented/complained that/it/a belief that the results were fantastic.
  c.   The results were fantastic, as Albert {boasted/commented/ complained}.

This extends to *seem*-type verbs (Stowell 1987):[41]

(153) a.   It appears (*a fact) that the earth really is round.
  b.   The earth is round, as it appears.

The facts suggest the following generalization:

(154) CPs with internal structure do not move.

What we are searching for, then, is a theory that ties the immobility of clauses not to their category (and therefore not to case or agreement) but to the presence of internal structure, perhaps the presence of a complementizer. The search is on.

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[41] What moves in *as* parentheticals may likely be a null operator (Stowell 1987). If so, a null CP operator moves. This raises further questions about the DP Requirement. Crucially, the explanation for the DP Requirement cannot simply be that there exist only DP-category null operators. If there exist both CP- and DP-type null operators, the environment (*as* clauses vs. all other frontings) must determine the admissible categories. This is a genuine problem that, to my knowledge, has not been addressed.

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