Scrapping clauses with clausal anaphors*

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Abstract

Close examination of an understudied kind of clausal ellipsis in English, *scrapping*, points to the existence of clausal anaphors in the binding-theoretic sense: clausal elements that must be c-commanded by a coindexed antecedent. In particular, the gap in scrapping contains a null ModP-sized anaphor, demonstrating the necessity of anaphoric routes to ellipsis. I show that four core properties of scrapping fall out from this analysis: the obligatory presence of operator movement, the requirement that the gap be contained within its antecedent, the small size of the gap, and the requirement that the antecedent c-command the gap at LF.

Keywords: ellipsis, antecedent-contained deletion, anaphors, null complement anaphora

1 Introduction

This paper starts with a question: *are there clausal anaphors*? By "anaphor," I intend the binding-theoretic sense of the term (as in Chomsky 1981, a.m.o.): an expression that must be c-commanded by a coindexed antecedent. The reader may prefer the term "reflexive." In this paper, I will be distinguishing between anaphors, which have to be c-commanded by a coindexed antecedent, and pronouns/proforms, which do not.

Certainly there are nominal anaphors, and there is a large literature examining their distribution and properties across a wide range of languages. And certainly there are clausal proforms, like *so* (Stowell 1987), which can appear with verbs which do not select for DPs, like *seem*:

(1) a. It seems so.

   b. *It seems that.

   c. *That seems.

The phenomenon of Null Complement Anaphora (NCA) is another case where people have invoked clausal proforms, though here they are null (Hankamer and Sag 1976, Depiante, 2000, Depiante 2001).

(2) a. Sohla said that Chris made these sandwiches, but I'm not sure pro_{CP}.

   b. Gaby asked Brad to clean the counter, but he refused pro_{CP}.

   c. Priya says green peppers are delicious, and I agree pro_{CP}.

But are there clausal anaphors? What would such a thing look like?

A clausal anaphor would need to have another clause within the same sentence that is coindexed with it—in other words, it needs a clausal antecedent. I assume that the semantic correlate of the syntactic notion of coindexation is identity of reference. In the case of e type expressions, two e type expressions count as identical if they are associated with the same index in the assignment function. In the case of σt type expressions, with σ standing for any type, I assume two σt type expressions count as identical if they are characteristic functions of the same subset of D_σ—in other words, if they are extensionally equivalent.[1] So a clausal anaphor needs an antecedent clause, within the same sentence, that has the same denotation as the anaphor.[2]

Furthermore, there will be a syntactic condition on the distribution of the clausal anaphor and its antecedent: the antecedent needs to c-command the anaphor. This syntactic condition is quite hard to satisfy: there aren't too many places where we find a clause c-commanding another clause with the same denotation. In the case of clausal embedding, for instance, we don't have a clause c-commanding another, but rather a clause contained within another clause. Instead, the kind of configuration we're looking for might be one where we have a clausal anaphor contained within a constituent that's adjoined to the antecedent clause, as schematized below:

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[1]Note that this is a stricter identity condition than is typically found in the domain of clausal ellipsis; for instance, it's stricter than the identity condition on sluicing (Merchant 2001, a.o.). I'll return to this point later.

[2]Note that I'm being intentionally vague here about the semantic type of "clauses". This is because, while whole *sentences* are often taken to denote propositions—i.e. expressions of type st—there is a large literature that discusses different sizes of clauses, and these different sizes of clauses may very well have different semantic types.

(3)   S
       /\
  S_antecedent   XP
                /\
           ... S_anaphor ...
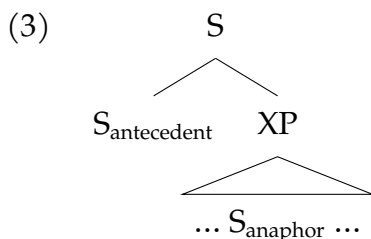
No back to the question: are there clausal anaphors? Or, putting it another way, are there expressions in natural language that behave as I outlined above? I argue that the answer is yes. In particular, I argue that we find clausal anaphors in the following kinds of elliptical constructions:[3]

(4) a. This building is bigger than I thought Δ!

  b. It started raining at the exact hour they predicted Δ.

  c. The shipwreck is located where the archaeologist claimed Δ.

  d. The queen arrived after we expected Δ.

These sentences feature the nonpronunciation of clausal complements to clause embedding verbs—there's a gap after *think*, *predict*, *claim*, and *expect*, marked by Δ, where we might expect some kind of overt complement clause. Some of the environments in which we find this kind of gap are comparatives (4a), relative clauses (4b-4c), and temporal adjunct clauses (4d). Close examination of sentences like these has largely escaped the literature, with the notable exceptions of Moltmann (1992a, 1992b), and Kennedy and Merchant (2000b).[4] I'll be calling this kind of construction *scrapping* (Sentential Complement Reduction in ACD Positions), for reasons that will soon become apparent. A particular instance of scrapping, as well as the gap left behind in scrapping, is a *scrap*.

My core thesis is this: scraps contain a null ModalP-sized (ModP) anaphor, which I'll call PRO_{ModP}. More specifically, the gap contains the following structure: $[_{ModP} \, Op \, PRO_{ModP}]$, with an operator adjoined to PRO_{ModP} that moves to create a degree, entity, or temporal abstract (as suggested by Patrick Elliott and Andrew Murphy, p.c.). In particular, I assume that this is a very low ModP that hosts root

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[3]Before I proceed any further, a quick disclaimer is in order: I've found that there's quite a lot of idiolectal variation here. The judgments presented in this paper are mine, and they have been cross-checked with native English speakers who accept the baseline sentences in (4). Further research will explore the source of this variation, analyzing what kinds of principled differences are found between speakers.

[4]As far as I'm aware, these are the only works that look at the properties of these constructions in any depth. Moltmann (1992a, 1992b) uses this as part of her argument that comparative deletion involves LF copying, and Kennedy and Merchant (2000b) focuses on the syntactic distribution of the gap, arguing that it's a DP denoting a proposition containing a free variable. Occasionally, one sees these constructions briefly mentioned in the literature: Bresnan and Grimshaw (1978), Napoli (1983), Wold (1992), and Kennedy and Merchant (2000a) cursorily mention these kinds of constructions, without closely examining their properties.

modals and first-merges *below* negation, in line with proposals like that of Iatridou and Zeijlstra (2013) regarding the underlying c-command relationship between deontic modality and negation.

The paper is organized as follows. In Section 2, I argue that scrapping cannot be reduced to NCA: they're licensed by different sets of predicates, and scrapping obligatorily involves moving an operator out of the scrap, whereas NCA categorically bans any kind of movement out of its gap. In Section 3, I argue that scrapping is limited to ACD contexts. Section 4 demonstrates that the size of the gap is smaller than one might think—it's smaller than CP or TP. I show that the gap hosts a low modality phrase (ModP) that immediately dominates *v*P. In Section 5, I show that scraps are only licensed when c-commanded by their antecedents post-QR—a crucial syntactic property that justifies the anaphoric analysis. Section 6 illustrates and discusses the proposed anaphoric analysis, showing how it captures all these facts. I also compare my analysis to that of Kennedy and Merchant (2000b), and discuss how they are similar and different. Finally, Section 7 concludes.

Some disclamatory notes: throughout this paper, I'll be talking about scrapping as if it's ellipsis, though I eventually settle on a non-PF-deletion analysis of it. And indeed, scrapping shares many of the same properties as ellipsis, such as the need for a linguistic antecedent, though ultimately it behaves differently from more canonical cases of ellipsis like VP ellipsis (VPE) and sluicing. Finally, I'll occasionally be providing striked-out paraphrases of the covert material. These should not be read as a proposal that the gap genuinely contains that material, but rather as a rough paraphrase of the intended interpretation of the scrap.

2 Scrapping is not NCA

At first glance, scrapping reminds one of Null Complement Anaphora (NCA). Both involved eliding the complement of a clause-embedding verb:

(5) *NCA*

    a.   Sasha knows who wrote the letter, and I know Δ too.

    b.   Borya thinks that this pizza is delicious, and I agree Δ.

    c.   Vasya wants to go home early today, and I understand Δ.

While this surface parallelism is initially tempting, scrapping cannot be reduced to NCA. Scrapping differs from NCA in several fundamental respects. In this section, I'll detail two of these differences. First, they're licensed by different sets of predicates, which would be surprising if scrapping and NCA are underlyingly the same phenomenon. Second, scrapping allows (and indeed requires) movement out of the gap, but NCA doesn't.

2.1 Licensing

The first thing to note is that the set of verbs compatible with scrapping is not the same as the set of predicates compatible with NCA. So far we've seen *claim*, *predict*, *expect*, and *think* license scrapping, none of which are NCA predicates:

(6) *Scrapping:* ***yes***
    a. This building is bigger than I **thought** Δ!
    b. It started raining at the exact hour they **predicted** Δ.
    c. The shipwreck is located where the archaeologist **claimed** Δ.
    d. The queen arrived after we **expected** Δ.

(7) *NCA:* ***no***
    a. *This building is big, and I **thought** Δ.
    b. *It started raining at six, and we **predicted** Δ.
    c. *The shipwreck is located on that island, and the archaeologist **claimed** Δ.
    d. *The queen arrived at noon, and we **expected** Δ.

In contrast, some predicates can both license scrapping and NCA, like *agree*, *guess*, and *insist*.

(8) *Scrapping:* ***yes***[5]
    a. Jade left exactly when we agreed ⟨she should leave *t*⟩.
    b. Julia got married exactly where we guessed ⟨she would get married *t*⟩.
    c. The queen arrived after we insisted ⟨she should arrive *t*⟩.

(9) *NCA:* ***yes***
    a. You said Jade should leave, and I agree Δ.
    b. **Q:** Did Julia get married? **A:** I guess Δ.
    c. Have some cake—I insist Δ!

So far, it might seem that scrapping predicates are merely a subset of NCA predicates. However, there are some predicates that are NCA predicates but crucially don't license scrapping, like *disagree*, *try*, and *be hopeful*:

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[5]Note that the surface string in the examples is actually ambiguous between a "low" parse and a "high" parse—the low parse being the scrapping reading, where an operator moves out from inside the gap, and the high parse being the NCA reading, where the operator is instead first merged outside of the gap, modifying the embedding verb. The fact, for these sentences, both readings are available, further indicating that *guess*, *agree*, and *insist* are both NCA and scrapping predicates.

(10) *Scrapping: **no***

    a. *Jade left when we tried ⟨~~to leave t~~⟩.

    b. *Julia got married exactly where we disagreed ⟨~~she would get married t~~⟩.

    c. *The queen arrived after we were hopeful ⟨~~she would arrive t~~⟩.

(11) *NCA: **yes***

    a. Carla isn't sure that this recipe will work, but I'll try Δ.

    b. Joe thinks Jade should leave, but I disagree Δ.

    c. Lucy doesn't think the basketball team will win, but I'm hopeful Δ.

In particular, the predicates that do not license scrapping seem to come in at least three types: negative predicates (like *disagree* and *doubt*), aspectual and implicative predicates (like *try*, *manage*, *begin*), as well as adjectival predicates (like *be certain* and *be hopeful*). I leave deeper exploration of the typology of NCA and scrapping predicates for further research. In any event, the conclusion I draw here is that if one seeks to reduce scrapping to NCA, they would need to do some work to reconcile that with that fact that the set of predicates that license NCA is not the same as the set of predicates that license scrapping.

2.1.1 *Please* **and** *like*

Bresnan and Grimshaw (1978), in their paper on free relatives, provide the following examples of what they call *pseudo-free relatives*, which seem to contain instances of scrapping:

(12)   a. Eat what you please Δ.

    b. Go wherever you like Δ.   (Bresnan and Grimshaw 1978:340)

I'll straightforwardly assume that these are instances of scrapping, as they involve eliding a clausal complement and the movement of an operator out of that elided clause (here, a relative clause operator). These sentences have readings that can be paraphrased as follows:

(13)   a. Eat what you (currently) feel like eating.

    b. Go wherever you (currently) feel like going.

However, the puzzling thing about these sentences is that *please* and *like* don't have *feel like* readings outside of scrapping contexts:

(14)   a. *You pleased eating fish/to eat fish.

    b. #You like going to the art museum/to go to the art museum.[6]

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[6]Note that these strings are actually grammatical, but under a different interpretation. They seem to require that the subject have direct personal experience with the embedded event—here,

Where does this contrast come from?

I suggest that certain verbs, like *please* and *like*, are actually homophonous between two verbs: *please₁* and *please₂*, *like₁* and *like₂*. We can then say that *please₁* and *like₁* have the meaning and selectional requirements that "typical" *please* and *like* have. In contrast *please₂* and *like₂* have the *feel like* reading and select for PRO$_{ModP}$ in their complement.[7]

2.2 Extraction

The second thing to note is that NCA and scrapping differ in their extraction properties. NCA is known to disallow extraction out of the gap, as demonstrated by the following examples.

(15)   a. *Roger agreed to review the movie, but I don't remember when he agreed Δ.

b.   A doctor volunteered to visit every patient, and a nurse also volunteered.
     $\exists \gg \forall$, *$\forall \gg \exists$

c. *Juan las   quiere ver,   y   María también las   quiere Δ.
    Juan them.F wants to.see and María también them.F wants
    'Juan wants to see them, and María also wants (to see them).'

d. Juan quiere verlas,   y   María también quiere Δ.
    Juan wants   to.see.them.F and María también wants
    'Juan wants to see them, and María also wants (to see them).'

In (15a), we see that *wh*-extraction is not acceptable out of an NCA gap. In (15b), we see that QR/covert movement is also not allowed. Finally, (15c) reveals that clitic climbing is not allowed either, in languages that have NCA and clitic climbing, like Spanish. Note that (15d), which is a version of (15c) but without any clitic climbing, is in fact an acceptable sentence (Depiante 2001). This indicates that it is in fact the movement involved in clitic climbing[8] that is rendering (15c) unacceptable.

Fact likes these (among others) have been used as an argument to justify a non-PF-deletion account of NCA, analyzing the gap instead as some kind of null clausal proform with no internal structure (e.g. Hankamer and Sag 1976, Depiante 2000, Depiante 2001). The intuition is that if there is no underlying structure (whose phonological form would subsequently be deleted), then there is nothing to move out—hence the ungrammaticality of movement out of NCA.

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they require that the subject has been to the art museum before. However, the scrapping sentences with *like* do not give rise to this kind of inference—they're fully compatible with a context in which the subject has never gone to wherever they're being told to go.

[7]Alternatively, we could imagine an account based on contextual allosemy in the context of PRO$_{ModP}$.

[8]Or alternatively, the attempted (and failed) agreement into the gap, if one takes Romance pronominal clitics to be the reflex of (just) agreement rather than movement.

Scrapping behaves differently. We seem to get interpretations where something *has* moved out of the gap. Consider the initial examples from (4), which all involve the movement of some kind of Ā operator, as schematized below:

(16) a. This building is bigger *Op* than I thought ⟨~~it was t big~~⟩!

   b. It started raining at the hour *Op* they predicted ⟨~~it would rain t~~⟩.

   c. The shipwreck is located where she claimed ⟨~~it was located t~~⟩.

   d. The queen arrived before *Op* we expected ⟨~~she would arrive t~~⟩.

In (16a), we have the movement of a degree operator; in (16b), we have the movement of a relative clause operator; in (16c), we have the movement of a *wh* item; in (16d), we have the movement of a temporal operator (Geis 1970, Larson 1987, a.o.). If we take these sentences at face value as cases of NCA, then we are faced with a puzzle: why do they feature movement out of their gaps?

Even more puzzlingly, they *require* movement out of the gap—we can't interpret the moved element as originating outside the gap.

(17) a. *It started raining at the hour *Op* they predicted *t* ⟨~~it would rain~~⟩.

   b. *The shipwreck is located where she claimed *t* ⟨~~it was located~~⟩.

   c. *The queen arrived before *Op* we expected *t* ⟨~~she would arrive~~⟩.

In (17a), the interpretation where the relative clause operator originates outside the gap, modifying the prediction time rather than the raining time, is unavailable. In (17b), the interpretation where *where* originates as an adjunct to *claim* and not *locate* is similarly unavailable. Finally, in (17c), we cannot get an interpretation relating the arrival time and the expecting time—we can only get the interpretation relating both arrival times.

The conclusion we must draw from (17) that that scrapping *obligatorily* involves the movement of some kind of Ā operator from the scrap. This fact poses a severe challenge to any account that proposes that scrapping involves merging a simplex null proform as the complement to a clause-embedding predicate.

In sum: scrapping is not NCA.

3 The ACD generalization

In this section, I argue that scraps must be contained within their antecedents. Assuming that scrapping is clausal ellipsis, you need to ensure that the antecedent is a clause, and the only other clause in the sentence is the matrix clause that contains the ellipsis site. I illustrate this antecedent-containment in (18), where I mark the

ellipsis site with a superscript E and the antecedent with a superscript A. I also underline the antecedent.

(18) a. $^{\text{A}}$[John got married exactly where he claimed $^{\text{E}}$[⟨that he got married⟩]].

b. $^{\text{A}}$[Bill left exactly when we said $^{\text{E}}$[⟨that he would leave⟩]].

c. $^{\text{A}}$[Mary arrived after we predicted $^{\text{E}}$[⟨that she would arrive⟩]].

d. $^{\text{A}}$[John read fewer books than he claimed $^{\text{E}}$[⟨he would read⟩]].

Here, I'll show that scraps not only *may* be located inside of the constituents they seem to take as antecedents, but also *must*. Under the common-sense assumption that scrapping is ellipsis of a clausal constituent larger than a VP, then it should take a constituent of that same sizee as an antecedent—however, scraps are systematically dominated by the clausal nodes they might putatively take as antecedents. This is the *ACD generalization*: scrapping obligatorily involves antecedent-containment.

First, I will use various constituency tests to show that scraps are actually *dominated* by vP, forcing them to reside well within their putative antecedents. Next, I will construct various kinds of non-ACD examples of scrapping, to show that no matter what one does, scrapping is always ungrammatical in non-ACD environments.

3.1 Constituency tests

We can perform VP preposing, VP ellipsis (VPE), and *do-so* replacement to show that scraps are (or at least can be) merged somewhere around vP:

(19) *VP preposing*

a. John said he would get married exactly where he claimed Δ, and [$_{v\text{P}}$ get married exactly where he claimed Δ] he did.

b. Bill said he would leave exactly when we said Δ, and [$_{v\text{P}}$ leave exactly when we said Δ] he did.

c. Mary said she would arrive after we predicted Δ, and [$_{v\text{P}}$ arrive after we predicted Δ] she did.

d. Mary said that John read fewer books than he claimed Δ, and [$_{v\text{P}}$ read fewer books that he claimed Δ] John did.

(20) *VPE*

a. John got married exactly where he claimed Δ, and Bill did [$_{v\text{P}}$ Δ] too.

b. Bill left exactly when we said Δ, and John did [$_{v\text{P}}$ Δ] too.

c. Mary arrived after we predicted Δ, and Jill did [$_{v\text{P}}$ Δ] too.

d. John read fewer books than he claimed Δ, and Bill did [$_{v\text{P}}$ Δ] too.

(21) do-so *replacement*

    a. John got married exactly where he claimed Δ, and Bill did so too.

    b. Bill left exactly when we said Δ, and John did so too.

    c. Mary arrived after we predicted Δ, and Jill did so too.

    d. John read fewer books than he claimed Δ, and Bill did so too.

All these constituency tests demonstrate that scraps are part of a constituent that can be fronted in VP preposing, deleted in VPE, and replaced in *do-so* replacement—which I assuming is roughly vP-sized. Assuming that their antecedent is larger than vP, this forces scraps to be inside their antecedents—a case of antecedent-containment. Eventually, I'll argue that scraps are actually (low) ModP sized, and take a ModP as their antecedent. Assuming that ModP dominates vP, and assuming that these tests diagnose vP-hood, my analysis preserves the notion that scrapping is only licensed under ACD.

3.2 Non-ACD scrapping?

Is ACD really necessary for scrapping? To test this, we can take the scrap out of its antecedent—for instance, by putting the antecedent and the scrap in different conjuncts of a conjunction. The result is ungrammatical:

(22) a. *I know that ^{A}[John got married somewhere], but where did he claim ^{E}⟨he got married t⟩?

    b. *I know that ^{A}[Bill left sometime during the dinner], but when did you say ^{E}⟨he left t⟩?

    c. *I know that ^{A}[Mary read some number of books], but how many did she claim ^{E}⟨she read t⟩?

So, at least in the simple cases, such as trying to construction examples of scrapping that look like sluicing, it seems like scraps need to be contained within their antecedents.

However, someone arguing against the ACD generalization might look at this data and come to a different conclusion: what if there's a *movement requirement* on scrapping, not an ACD requirement, such that you just need to Ā move something out of the ellipsis site in order to license scrapping?[9] After all, it seems somewhat unexpected that this kind of grammatical process should be sensitive to global structural relationships in the clause, like the relationship between gap and antecedent, rather than more local properties like movement (which leaves a trace inside the gap). Let's see if this works out. (Spoiler: it doesn't.)

If we adopt the hypothesis that it's movement that licenses scrapping, and assume that scrapping involves ellipsis, then the moved element must leave a trace

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[9] I thank Danny Fox for pushing me to consider this suggestion.

in the ellipsis site that needs a corresponding trace in the antecedent, given a sufficiently strict parallelism condition. In order to get a trace in the right position in the antecedent, you thus end up QRing the constituent that contains the trace. And thus we "accidentally" license ACD, without any "ACD requirement" per se—that comes epiphenomenally out of the putative movement requirement. This line of thinking is illustrated below, with antecedents underlined, and a constituent containing the ellipsis site QRed to the left:

(23) a. [exactly where he claimed ⟨he got married *t*⟩] John got married *t*.

      b. [exactly when we said ⟨he would leave *t*⟩] Bill left *t*.

      c. [after *Op* we predicted ⟨she would arrive *t*⟩] Mary arrived *t*.

      d. [-er than *Op* he claimed ⟨he would read *t*-few books⟩] John read *t*-few books.

Here, we can see the ellipsis site contains the trace of a moved operator. In order to create a sufficiently parallel antecedent with a trace in the same place, we need to QR a constituent that occupies a corresponding position in the antecedent. In doing so, we "accidentally" license ACD.

If strict parallelism plus a movement requirement is the correct generalization for scrapping, then we predict that we should be able to get scrapping in non-ACD contexts, as long as we control the antecedent correctly to contain a trace in the correct position. As we'll see, this prediction is not borne out.

One way of ensuring strict parallelism is by ATB movement, moving out of both the antecedent and the ellipsis site at once. This is OK in VPE, but bad in scrapping:

(24) *ATB with VPE good, ATB with scrapping bad*

      a. How$_i$ did [Jo hope I would <u>cook the potatoes t_i</u>] and [Lily fear I would ⟨cook the potatoes t_i⟩]?

      b. *How$_i$ did [Jo hope <u>I would cook the potatoes t_i</u>] and [Lily fear ⟨I would cook the potatoes t_i⟩]?

By ATB moving a manner adverb *how* out of both conjuncts, we leave parallel structures inside both. Thus, one of the conjuncts could in principle license ellipsis in the other—and this is exactly what we see in the VPE case (24a). However, scrapping is not licensed in this exact same configuration (24b). This is left unexplained under the movement requirement analysis, but comes for free under the ACD requirement analysis: the gap is not contained inside its antecedent at any step in the derivation.

Another way of doing the same thing is by making the antecedent an embedded question. Again, we find that this is fine for VPE, but bad in scrapping:

(25) I wonder when$_i$ <u>Harry left for the theater</u> t_i.

    a.   Well, I asked Sally when$_i$ she claimed he did ⟨~~leave for the theater t_i~~⟩, but she didn't say.

    b.   *Well, I asked Sally when$_i$ she claimed ⟨~~he left for the theater t_i~~⟩, but she didn't say.

Thus, the simple movement generalization plus syntactic parallelism story doesn't work. No amount of isomorphism can save non-ACD scrapping. The ACD generalization remains: scrapping is only licensed under ACD.

3.2.1 A counterexample?

An anonymous reviewer pointed out that they found the following sentence grammatical, and that it constituted a violation of the ACD generalization (focusing *hoped* and *feared* sharpens the judgment).

(26) %I know what she hoped I would cook, but not what she feared Δ.

I have been able to replicate this judgment with a few native speakers (but not all). However, I believe this example is flawed—there is a possible parse where *what* is not moving out of an elided clausal complement, but rather *what* is itself the complement of *fear*, acting as a *wh*-item ranging over propositions. A sketch of this kind of analysis is provided in (27), with a sample Hamblin denotation for the *wh* question provided in (27b).

(27) a.   ...but not what she feared t.

    b.   ⟦what she$_3$ feared t⟧^{g} = { p | ∃p′ [p = **fear**(g_3)(p′)] }

Here, there is no unpronounced material, be it elided or a null proform of some sort—rather, *what* is simply a complement of *fear*, and it moves to create a *wh* question over propositions. In this particular context, it might then be possible to restrict the domain of the propositional *wh*-word to propositions of the form *I would cook* x, for all contextually relevant cookable entities x. The variation in judgments might come from whether different speakers can accommodate this kind of domain restriction or not.

    An indication that this kind of analysis for the putative counterexample in (26) is on the right track comes from the fact that if you replace *what* with another *wh* item that can't range over propositions, the sentence becomes infelicitous—even for those speakers that accept (26).

(28) #I know *which dish* she hoped I would cook, but not *which dish* she feared.

The infelicity here comes from the fact that you can only parse *which dish* as the complement of *fear*, rather than as the object of an elided *cook*, and that reading is judged to be nonsensical in context. This contrast comes for free under my analysis

of this counterexample—since *which dish* can't be read as a *wh*-item ranging over propositions, you aren't able to construct a contextually-sensible reading for (28). Additionally, since the complement of *fear* is not dominated by the complement of *hope*, the complement of *hope* cannot license scrapping of the complement of *fear*— so the sensible scrapping reading is also unavailable. In sum: while (26) looks to be a counterexample to the ACD generalization on the surface, it falls apart under closer inspection.

4 Small scraps

So far, we've seen that scrapping cannot be reduced to NCA, and also that scrapping seems to be subject to an ACD requirement. While these facts are puzzling enough on their own, here I add another piece to the puzzle: scraps are structurally reduced clauses, containing at most a low ModP that is merged below negation. I argue for this conclusion on the basis of four observations: i) scraps can occur in relative clauses headed by negative polarity items (NPIs), in which case they cannot QR above negation and thus must take as their antecedent a constituent smaller than NegP; ii) scraps show the same temporal orientation properties as infinitival clauses, suggesting that they do not contain independent tense; iii) scraps cannot contain sentential negation, suggesting they're smaller than NegP; and iv) scraps can contain root modals, indicating that they're at least as large at ModP. Taking all these facts together, I conclude that scraps do not have an independent tense projection, do not contain a projection hosting negation, but do contain a projection that hosts root modals, as illustrated by the boxed structure below.

(29)   *The size of the scrap*
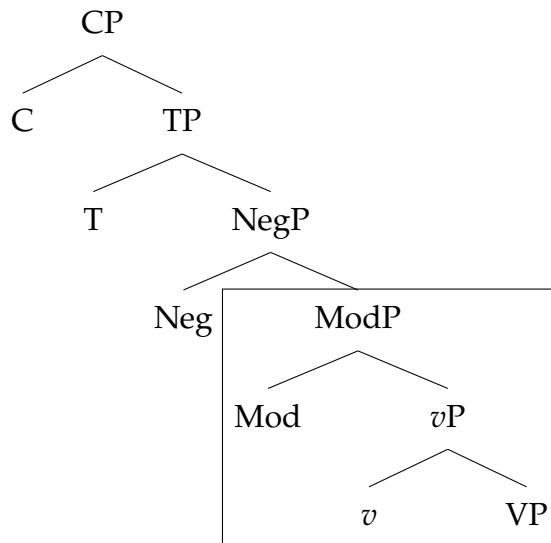
4.1 Scraps and NPIs

Since scrapping is clausal ellipsis in an ACD configuration, one might imagine that the scrap would need to QR quite high in order to escape antecedent-containment and create an adequate antecedent. Naively, one might assume that scrapping is ellipsis of a CP or TP projection, and thus requires QRing the scrap out of CP/TP. But not so—consider the following NPI data, where the scrap can't have QRed out of TP or CP:

(30) a. The storm didn't hit anywhere the weather report predicted ⟨the storm to hit⟩.[10]

     b. The church bells never ring at any time we expect ⟨the church bells to ring⟩.

Under standard assumptions, the NPIs *anywhere* and *any time* must remain below negation. This means that the scrap can't QR above negation—it can maximally QR to a position right below negation. However, if the gap is CP/TP-sized, then this would mean that the scrap couldn't escape its antecedent, and thus we shouldn't be able to license any kind of ellipsis here (under the standard assumption that negation in English is below TP). This suggests that scraps must (or at least can be) be smaller than TP, in order to be able to be licensed in configurations such as these.

Another important thing to observe is that the only available interpretation of the unpronounced material is *positive*: *the storm to hit* and *the church bells to ring*, rather than *the stom to not hit* and *the church bells to not ring*. This polarity mismatch suggests that the scrap really is taking as its antecedent a constituent that's smaller than NegP—providing further support for the idea that scraps are smaller than NegP.

Of course, this argument only goes through if we assume that the antecedent and ellipsis site must be the same size. This isn't a trivial assumption. For instance, Yoshida (2010) and Rudin (2019) argue that sluicing can be licensed under identity with a *v*P-sized antecedent, suggesting that, at least some of the time, the antecedent for ellipsis can be smaller than the ellipsis site. However, in the next three sections I provide further evidence that scraps really *must* be small.

4.2 Scraps and infinitives

Another argument for the reduced size of scraps comes from the kinds of temporal interpretations they give rise to under predicates that can embed infinitives. In particular, scraps behave as if they're infinitival clauses, sharing the same restrictions

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[10]Note also that you can't have negation in the scrap—you're forced into a "mismatched" reading. This could plausibly be due to an inner island effect, though I argue later that this is due to an independent constraint against negation inside scraps.

on temporal interpretation that are found with overt infinitival complements when they are embedded under certain predicates.

For instance, verbs like *expect*, when they take an infinitival complement with an eventive predicate, force a future oriented interpretation of the infinitive:

(31) *Obligatory future orientation with infinitive complements*

    a. I expect him to run tomorrow.

    b. *I expect him to run yesterday.

Contrast this to finite complements, where there isn't any futurity requirement:[11]

(32) *No obligatory future orientation with finite complements*

    a. I expect that he will run tomorrow.

    b. I expect that he ran yesterday.

With this pattern in mind, we can ask which interpretations can be found in scrapping: can scrapping obtain both future and past interpretations, or is it similarly restricted to future-oriented ones?

As we can see, scrapping imposes a similar future-orientation requirement on the ellipsis site:

(33) *Obligatory future orientation with scrapping*

    a. Harry <u>will arrive</u> earlier than Sally expects ⟨he will arrive⟩.

    b. *Harry <u>arrived</u> earlier than Sally expects ⟨he arrives⟩.

Here, in order to modulate the tense in the scrap, we can change the tense in the antecedent (marked by the underline). As we can see, if the antecedent is future and *expect* is present, the sentence is acceptable. However, if the antecedent is past and *expect* is present, then the sentence becomes unacceptable. This demonstrates that the scrapped complement of *expect* must be interpreted in the future of the expectation time—that is, scraps are subject to the same future orientation requirement under *expect* that infinitival clauses are subject to.

It has been argued (e.g. by Wurmbrand 2014, a.o.) that this future orientation arises in part due to the the absence of a TP layer in the infinitival complements of verbs like *expect*. In other words, the restricted temporal properties of certain infinitival complements arises due to *restructuring*. If we accept these proposals, then the fact that scraps show future-orientation under *expect* suggest that they too are TP-less, reduced/restructured clauses. These facts, taken together with the NPI facts, strongly suggest that scraps must be smaller than TP.

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[11]There is also a difference in modal flavor, but I leave this distinction aside in this paper. Though for what it's worth, the modal interpretation of *expect* when it embeds an infinitive is the same as when it embeds a scrap.

4.3 Scraps and sentential negation

Not only are scraps smaller than TP, they're also smaller than sentential negation. In order to look at the relationship between scrapping and negation, we have to be wary of inner/negative island effects. If there's negation inside a scrap, the Ā operator that moves out of the scrap will end up crossing over negation, which could in principle result in an inner island violation (Ross 1984, Rizzi 1990, Szabolsci and Zwarts 1993, a.o.). Thus, we need to be careful to construct examples that do not independently show inner island effects.

Example (34) provides a case of a relative clause that's not subject to inner islands—the relative clause operator can move across negation both in the embedded clause and the matrix clause. This holds even in the case of scrapping.

(34) ***Context:*** *Tanya's friend Anton is planning a move. Tanya knows that Anton is a cheapskate, so she expects that he will not move to Boston or Cambridge, because rent is rather expensive in those cities. She predicts he will move to Medford. However, unexpectedly, it turns out that Anton moved to Boston. So...*

    a. Anton moved to one of the cities *Op* that Tanya **didn't** expect he would ⟨move to *t*⟩.

    b. ? Anton moved to one of the cities *Op* that Tanya expected he **wouldn't** ⟨move to *t*⟩.

    c. Anton moved to one of the cities *Op* that Tanya **didn't** expect ⟨he would move to *t*⟩.

Example (34a) demonstrates that the relative clause operator can move across negation in the matrix clause; example (34b) demonstrates that the relative clause operator can move across negation in the embedded clause; and example (34c) demonstrates that the relative clause operator can move out of a scrap and across matrix negation. What about the fourth case: can there be negation inside the embedded clause that goes missing in scrapping?

Example (35) tells us the answer is no—there can be no negation within the scrap.

(35) ***Context:*** *Tanya's friend Anton is planning a move. Tanya knows that Anton is a cheapskate, so she expects that he will not move to Boston or Cambridge, because rent is rather expensive in those cities. She predicts he will move to Medford. And, exactly as Tanya predicted, it turns out that Anton didn't move to either Boston or Cambridge, but rather to Medford. So...*

    a. ? Anton didn't move to one of the cities *Op* that Tanya expected he wouldn't ⟨move to *t*⟩.

    b. # Anton didn't move to one of the cities *Op* (that) Tanya expected ⟨he wouldn't move to *t*⟩.

In (35a), we see that it is (marginally) possible to have negation inside the embedded clause in this context. However, in (35b), we can see that once we scrap the embedded clause, then suddenly the interpretation available in (35a) is entirely unavailable. In fact, the only interpretation available for that sentence is one in which the scrap is positive, not negative: *Tanya expected Anton would move to a city* x, *and Anton didn't move to* x. And that reading is false in this context.

From (34) and (35a), we know that the infelicity of (35b) can't be due to an inner island—so it must be due to independent properties of scrapping. A straightforward way to understand this restriction is to say that the elided material in scrapping is smaller than NegP. Since scraps are smaller than NegP, they cannot contain sentential negation, correctly accounting for the infelicity of (35b).

4.3.1 Constituent negation

Note that my analysis only predicts that *sentential* negation—that is, negation that occupies NegP on the clausal spine—can't be inside a scrap, since a scrap is too small. But what about *constituent* negation? My analysis predicts that consituent negation merged low enough (for instance, directly negating a VP) should be able to survive in scrapping. One could imagine an alternative theory, which is that the inability of scraps to host sentential negation derives from some sort of inability to host *any* kind of negation. This alternative approach would predict that constituent negation shouldn't be allowed inside a scrap. But as we'll see, the data points in the direction of the clause size based analysis.

Strikingly, constituent negation *is* in fact able to be interpreted inside a scrap, in sharp contrast to sentential negation. Consider the following example:

(36)　**Context:** *Your friend Mary has had digestive issues for several years now, and she finally went to the doctor to figure out what's going on. The doctor recommended that she not eat wheat, dairy, and beans. You know that Mary always follows the doctor's orders, so you expect that she's going to stop eating those foods. And later, sure enough…*

　　a.　#Mary has **not** been eating the foods I expected ⟨her to not eat⟩.

　　b.　Mary has been **not** eating the foods I expected ⟨her to not eat⟩.

By the position of *not* in the antecedent, we can tell whether we have sentential negation (36a) that follows the first auxiliary that has raised to T, or constituent VP negation (36b) that directly merges with and negates the VP. In this context, the sentential negation sentence (36a) is infelicitous, precisely because the only reading available is one without negation in the scrap: *Mary has not been eating the foods I expected her to eat*. In contrast, the constituent negation sentence is acceptable (36b), revealing that negation that's merged low enough can survive scrapping. This indicates that the unavailability of sentential negation in scraps really is due to the *size* of the scrap (i.e. it being smaller than NegP), rather than some independent

constraint that bans negation altogether inside the scrap. In sum, scraps must be smaller than NegP.

4.4 Scraps and modals

Here, I demonstrate that it's possible to interpret deontic and circumstantial modals inside scraps, suggesting that scraps are at least large enough to contain root modals.

Deontic modals are able to be interpreted in the gap. For instance, we can have strong deontic modals:

(37)   *Recently, the department changed the requirements for getting a PhD. Before, the requirement was to write two qualifying papers. Now, the requirement is only to write one. However, the students haven't realized this yet, and they still think they need to write two. One of the professors, noting this fact, says to another:*

The students have to write fewer qualifying papers than they think.

In this context, the interpretation of the sentence is as follows: the students think that, in view of their obligations as PhD students, they must write n-many generals papers; however, they actually must write fewer than n-many generals papers. In other words, the number of papers they have to write in the actual world is less than the number of papers they have to write in their belief worlds. We can represent this reading with a simple basic maximality-based semantics for comparatives,[12] as in (38), where **s** is the plural individual picked out by *the students*.

(38)   a. $\mathbf{max}(\lambda n.\Box\mathbf{write}(n\text{-many papers})(\mathbf{s})) <$
            $\mathbf{max}(\lambda m.\mathbf{think}(\mathbf{s})(\Box\mathbf{write}(m\text{-many papers})(\mathbf{s})))$

        b.   *The maximal number n such that the students must write n-many papers is less than the maximal number m such that the students think they must write m-many papers.*

This is an interpretation where a deontic modal is interpreted inside the scrap, and the degree phrase *than they think* scopes above matrix *have to*.[13] This tells us two things: i) scraps are large enough to contain deontic modals; and ii) when the DegP with a scrap inside contains a deontic modal, it has to QR out of the ModP it's contained in, resulting in the DegP scoping over the matrix modal. This

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[12]I don't think anything crucial hinges on this assumption, and it should be possible to adapt this to other theories of the semantics of comparatives.

[13]If the degree phrase scoped below the matrix modal, we would get the following (unattested) reading:

(i)   (a) $\Box[\mathbf{max}(\lambda n.\mathbf{write}(n\text{-many papers})(\mathbf{s})) <$
            $\mathbf{max}(\lambda m.\mathbf{think}(\mathbf{s})(\mathbf{write}(m\text{-many papers})(\mathbf{s})))]$

        (b)   *It is necessary that the maximal number n such that the students write n-many papers is less than the maximal number m such that the students think they write m-many papers.*

behavior is entirely expected if a scrap is ModP-sized—it's a ModP contained inside its antecedent ModP, so it needs to QR out of its antecedent, in which case it ends up scoping higher than the matrix modal.

Weak deontic modals are also able to be interpreted inside scraps:

(39) *There's a very exclusive VIP party happening at a club, with very strict entry times. Molly thinks they're only letting people in at 10:30. However, unbeknownst to her, they're also letting people in at 10:45.*

Molly can get in 15 minutes later than she thinks.

The interpretation is that Molly can get into the club 15 minutes later than 10:30, which is the only time she thinks she can get in. Here, the interpretation of the scrap has to be something like *than the time Molly thinks she can get in*, showing that a weak deontic modal is indeed able to be interpreted inside a scrap. Again, note that the DegP here scopes above the matrix modal.

So far, we've seen that both strong and weak deontic modals are available inside scraps. In addition, circumstantial/ability modals are also available.

(40) *Colin has a low opinion of his candy-eating abilities, and thinks he can only eat a few candies in a single sitting. However, I have greater faith in his candy-eating abilities, and think he can eat many candies in a single sitting. I say to him:*

You can eat more candies than you think!

Here, the interpretation is something like *the maximum amount of candies Colin can eat is greater than the maximum amount of candies Colin thinks he can eat*. Again, this is an interpretation where there is a deontic modal in the scrap, and the DegP containing the scrap scopes above the matrix modal.

In summary, since both deontic and circumstantial modals are interpretable inside scraps, scraps must at least be ModP sized. Under the assumption that root modals are merged immediately below sentential negation, they must furthermore be *maximally* ModP sized, given that they do not host independent tense or sentential negation.

4.4.1 Epistemic modals?

Given that epistemic modals are first-merged quite high in the clausal spine (Cinque 1999, Hacquard 2006, 2010, a.o.), my proposal predicts that epistemic modals should not be able to be interpreted inside scraps, since they're higher than root ModP. This is actually quite difficult to test, given that sentences seem to be interpreted as epistemic/doxastic modalized propositions relative to the speaker's/attitude-holder's beliefs. It is thus difficult to tell whether a scrap contains a "real" epistemic modal, or are merely interpreted as modalized for independent (perhaps pragmatic) reasons.

However, I think it is possible to test this, if we ensure that we're testing an epistemic *possibility* modal, preferably in a context where the prejacent is viewed by the attitude holder as possible but quite unlikely. And, once we carefully construct such a context, it seems like this prediction is verified: epistemic modals cannot be interpreted inside scraps.

(41)   ***Context***: *María and Juan are at an art auction. María knows that Juan has expensive taste, and usually always buys very expensive paintings. However, Juan has expressed the opinion that he thinks all the paintings on auction, except the cheapest painting, are unbearably ugly, and he won't purchase them. María thinks that there's a small chance that Juan will end up getting the cheap painting, because Juan hates leaving an auction empty-handed. But she suspects, more likely than not, that he'll leave empty-handed and disappointed.*

    a.   Juan might purchase the painting María expected he might Δ.

    b. #Juan might purchase the painting María expected Δ.

Here, we find a contrast between (41a) and (41b), indicating that the weak epistemic modal *might* isn't able to be interpreted in the scrap. The sentence in (41b) is infelicitous precisely because it only gets the epistemic/doxastic *necessity* interpretation we'd expect from a non-overtly-modalized sentence: the only reading available for (41b) is one that can be paraphrased *Juan might purchase the painting María expected he will*.

4.4.2   Where does the modality come from?

The careful reader may have noticed that many of the paraphrases I've provided for scraps contain modals, like *would* and *should*, as illustrated in (42).

(42)   a.   The queen arrived after we expected ⟨she ~~would arrive~~⟩.

    b.   Bill left exactly when we agreed ⟨he ~~should leave~~⟩.

Indeed, these paraphrases seem to be an accurate representation of the attested interpretation of the scrap. A natural question arises at this point: there is no modal in the antecedent for the scrap, so where does this modal interpretation come from?[14]

One might imagine a response of the following shape: scraps contain a ModP projection, and the hearer might employ some kind of pragmatic principles (that need to be spelled out in full) to "fill in" the missing modal, or perhaps the embedded predicate imposes certain selectional restrictions on the embedded modal (e.g. Wurmbrand 2014). The core intuition here might be that, in principle, the modal interpreted inside the scrap can freely vary, subject to some kind of scrapping-external factors that restrict the possible modals that can appear.

However, my analysis makes such an intuition quite difficult to pursue, and I will be forced to commit to saying that such unanteceded modals actually *cannot*

[14]I thank Roger Schwarzschild (p.c.) for raising this important point.

appear in a scrap—the modal reading must come entirely from some other source, like the embedding verb. However, I will delay discussion of this point until Section 6.3.1, after I introduce my analysis.

5 C-command

Now that we have examined the size of scraps, we can now turn to another question: given that scrapping is an instance of ACD, it needs to QR out of its antecedent— so where can it QR to? Here, I show that scraps must QR to a position that's c-commanded by their antecedents, and no higher—that is, they must QR to adjoin directly to their antecedent. I argue for this on the basis of the fact that scraps cannot QR above negation, and by examining the interaction between scrapping and intensional predicates. In each case, I'll show that the only interpretations available are those generated by QRing the scrap to directly adjoin to its antecedent, and no others.

5.1 Scope and negation

In the previous section, we saw that scraps are smaller than NegP, and thus they take as their antecedents constituents smaller than NegP. In this section, I ask the following question: can scraps QR above negation? Which of (43) and (44) are possible LF configurations? I've boxed the antecedent ModP$_A$, underlined the scrap ModP$_S$, and indicated the base position of the moved XP containing the scrap with t_{XP}.

(43), (44)
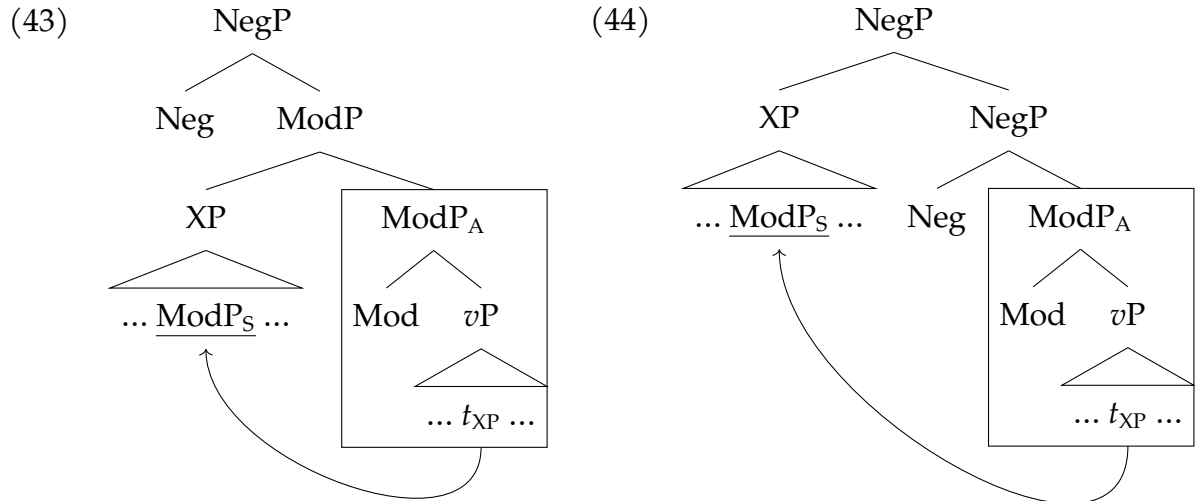
I'll show that, while (43) is possible—the scrap QRing below negation, adjoining directly to its antecedent—the configuration where the scrap QRs above negation (44) is impossible.

In order to test this, I will embed the scrap inside a relative clause modifying an existential, and then test to see whether that existential can scope above or below matrix negation. I'll be assuming that existentials (at least $a(n)$) take scope by QR.[15] In order to do so, I will construct contexts that either only felicitously accept the surface scope reading or the inverse scope reading. As we'll see, only the surface scope reading ($\neg \gg \exists$) is available.

In (45), I construct a context that accepts a surface scope interpretation of the sentence *Anton didn't move to a city Tanya expected*:

(45) **Context:** *Tanya's friend Anton is planning a move. Tanya knows that Anton is a cheapskate, so she expects that he will move to either Brighton, Medford, or Somerville, since rent is relatively cheaper in those cities. Later, it so turns out that Anton ended up moving to Watertown. So…*

  a. Anton didn't move to a city Tanya expected ⟨him to move to⟩.

  b. $\neg \gg \exists$

We can paraphrase this meaning with the following: *it is not the case that Anton moved to a city Tanya expected him to move to.* As is evident, this is a felicitous description of the context scenario.

Next, in (46), I construct a context that only accepts the inverse scope reading:

(46) **Context:** *Tanya's friend Anton is planning a move. Tanya knows that Anton is a cheapskate, so she expects that he will move to either Brighton, Medford, or Somerville, since rent is relatively cheaper in those cities. Later, it so turns out that Anton ended up moving to Medford. So…*

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[15]There are problems with this, given the empirical possibility of exceptional wide-scope indefinites and the theoretical possibility of choice functional analyses (Fodor and Sag 1982, Abusch 1993, Kratzer 1998, Matthewson 1999, Schwarzschild 2002, a.m.o.). For the purposes of this paper, I'll be assuming that existential quantifiers headed by $a(n)$ take scope by QR, and we'll see that indeed, they will not be able to scope above negation in scrapping. Unfortunately, it won't be very helpful to test universal quantifiers, since $\forall \gg \neg$ entails $\neg \gg \forall$, and thus low scope of the universal is compatible with high scope contexts.

In fact, certain existential quantifiers embedding a scrap *do* seem to be able to take scope above sentential negation, as pointed out to me by Roger Schwarzschild (p.c.):

(i) *Wide-scope $\exists \gg \neg$ reading available*

  (a) Anton didn't move to **a certain** city that Tanya predicted Δ (but he moved to another that she predicted).

  (b) ?Anton didn't move to **(at least) one of the** cities Tanya expected Δ (but he moved to another that she predicted).

For the purposes of this paper, I will assume that these quantifiers do not take scope by QR, in contrast to $a(n)$—maybe they are interpreted as choice functions, for instance. As should be apparent, this issue deserves much more thought than I have room to devote here.

    a. *Anton didn't move to a city Tanya expected ⟨him to move to⟩.

    b. *∃ ≫ ¬

We can paraphrase this meaning with the following: *there exists a city that Tanya expected Anton to move to, such that Anton didn't move to that city*. This is in principle a felicitous description of the context scenario—Tanya predicted that Anton would move to Brighton (among other places), and Anton did not move to Brighton. However, despite this, the sentence cannot get this interpretation. The conclusion I draw from this is that the constituent containing the scrap can't QR above negation. Evidently, the configuration in (43) is available, but the configuration in (44) is not.

The unavailability of the inverse scope reading in scrapping isn't due to independent properties of the sentence—the full sentence, without any missing material, allows both scope possibilities. You can test this by reading (47) against both contexts, and you'll find that it's acceptable in both cases.

(47)   *Anton didn't move to a city Tanya expected he would move to.*

    a. ✓¬ ≫ ∃

    b. ✓∃ ≫ ¬

So what's going wrong in scrapping? I suggest the following generalization:

(48)   *The c-command generalization*

    Scraps must be interpreted in a position where they are c-commanded by their antecedents.

As you can see, the boxed antecedent ModP c-commands the scrap ModP in the surface scope configuration (43), but it doesn't in the inverse scope configuration (44). The c-command generalization acts as a "wall" for how far a scrap can QR. Is there any evidence for this wall in other domains?

5.2 Scope and intensional predicates

The answer is yes: we can find similar effects when we look at intensional predicates, and see if scraps can be read *de re* or *de dicto*. I'll be assuming a scope theory of *de re*/*de dicto*, with *de dicto* phrases remaining below the scope of the intensional operator, and *de re* phrases QRing above the intensional operator (for instance, my conclusions here should be compatible with Demirok 2019 and Elliott 2020).

What we find is that there seems to be a relationship between the size of the gap's antecedent, and the position that the constituent containing the gap QRs to. If we have an attitude predicate embedding a clause, and a scrap in that embedded clause, the antecedent for the scrap could in principle either be the embedded clause (a low antecedent) or the matrix clause (a high antecedent). The scrap could also in principle either QR to a position inside the embedded clause (and get a *de*

dicto interpretation), or to a position in the matrix clause (and get a *de re* interpretation). Taking all these possiblities together, I'll show that the following scope and antecedent size possiblities are available with scrapping:

(49)

	low antecedent	high antecedent
low QR	✓	∗
high QR	∗	✓

The size of the antecedent correlates with the position to which the scrap QRs: low QR, low antecedent; high QR, high antecedent.[16] I will demonstrate that this pattern falls out of the c-command generalization.

Let's go through each case. Low QR and low antecedent is possible:

(50) *Carla has the mistaken belief that Andy thinks I will arrive late today. Unbeknownst to Carla, Andy knows that I'm a very punctual person. As he (actually) expected, I arrived on time.*

Carla believes that I arrived earlier than Andy thought ⟨I would arrive⟩ (but Andy actually knew I would arrive on time).

Here, we must read the DegP *than Andy thought* relative to Carla's beliefs, and not the speaker's beliefs, because it's only the case that Andy arrived earlier than the time that Carla *thought* Andy believed I would arrive, not the time that Andy *actually* believed I would arrive. Thus, we have a *de dicto* reading: low QR. We also have a low antecedent: just the embedded clause.

High QR and high antecedent is also possible:

(51) **Context:** *Brad believes that Molly wants to own a chihuahua, but Molly actually wants to own a Great Dane.*

   a. Molly wants to have a bigger dog than Brad thinks ⟨Molly wants to have a d-big dog.⟩

   b. DegP ≫ want

In this context, Molly doesn't have any relevant desires or beliefs about what Brad thinks, so the DegP is scoping above *want*.

However, low QR and high antecedent is impossible—which is entirely expected, given that this would result in unavoidable antecedent-containment:

(52) **Context:** *Molly and Brad are in a rivalry, and Molly wants Brad to always be wrong. Brad knows that Molly is planning on getting a dog, and he has been guessing about what kind of dog and how big it'll be. Molly doesn't actually really care about the size of the dog that she gets, as long as it's bigger than what Brad thinks she wants.*

   a. #Molly wants to have a bigger dog than Brad thinks ⟨Molly wants to have a d-big dog.⟩

   b. *want ≫ DegP

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[16] A similar pattern has been noted in the domain of stripping in temporal adverbials—sentences like *Whiskers woke up before Fido*—by Overfelt (2019). It remains to be seen whether his cases can be subsumed under my analysis of scrapping, or vice-versa.

Here, Molly has a desire about how big her dog is relative to what Brad thinks she wants, so the DegP should be scoping below *want*. However, this sentence is infelicitous in this context, indicating that the *de dicto* reading of the DegP is unavailable. We can understand the unavailability of this reading as a case of irreconcilable antecedent-containment: the the DegP containing the scrap has failed to QR out of the scrap's antecedent.

Perhaps unexpectedly, high QR and low antecedent is not possible, even though this configuration successfully gets the ellipsis site out of its antecedent. Consider the following case:

(53)   *Brad has just moved in to a new house in the neighborhood. He knows his neighbor is named Molly, but they haven't properly met yet. Molly doesn't know who Brad is. One day, Brad hears some dog yapping in a high-pitched voice in Molly's house. He forms the belief that Molly owns a very small dog. However, in actuality, Molly doesn't own any dog—she was just taking care of her friend's chihuahua. Molly is a dog lover, and wants to own a dog—in particular, she wants to have a great dane.*

    a. *Molly wants to have a bigger dog than Brad thinks ⟨she has a d-big dog.⟩

    b. *DegP ≫ want

In this context, since Molly has no beliefs whatsoever about Brad (they haven't even met yet), the DegP must necessarily be read *de re*. Additionally, Brad doesn't have any beliefs about what Molly wants—he doesn't believe that Molly wants any particular sized dog—he only have beliefs about whether or not she owns a dog, and what size dog she putatively owns. Thus, in this context, the only sensible reading that should be available is the low antecedent, high QR reading. However, this sentence is unacceptable in this context, indicating that the low antecedent, high QR reading is unavailable in scrapping.

This is somewhat unexpected, under a naive view—after all, the gap has escaped antecedent-containment, so we should be able to license ellipsis. Indeed, the high QR, low antecedent reading becomes available with VPE:

(54)   *Brad has just moved in to a new house in the neighborhood. He knows his neighbor is named Molly, but they haven't properly met yet. One day, Brad hears some dog yapping in a high-pitched voice in Molly's house. He forms the belief that Molly owns a very small dog. However, in actuality, Molly doesn't own any dog—she was just taking care of her friend's chihuahua. Molly is a dog lover, and wants to own a dog—in particular she wants to have a great dane.*

    a. Molly wants to have a bigger dog than Brad thinks she does ⟨she has a d-big dog.⟩

    b. √DegP ≫ want

Thus, the unavailability of this reading in scrapping must derive from some independent source—it is not a properly of ellipsis generally. In particular, I suggest

that this pattern derives from the c-command generalization: the low antecedent, high QR configuration is one in which the antecedent cannot c-command the scrap. The scrap has QRed too high to be c-commanded by its antecedent. Thus, the c-command generalization correctly predicts the ungrammaticality of this example.[17]

But why should scrapping be sensitive to the c-command relationship between scrap and antecedent? In the next section, I suggest a simple answer: the scrap is an anaphor. Like other anaphors, it must be c-commanded by its antecedent.

6   The PRO$_{\text{ModP}}$ analysis

Now that we've discussed some of the core properties of scrapping, I'll present an analysis of scraps as ModP-sized bound anaphors, and show how this analysis accounts for all the generalizations introduced above. In this section, I'll first provide a brief recap of the discussion so far, introduce the core proposal, and then show how it accounts for all the facts we've seen.

6.1   Recap

I've introduced four main properties of scrapping. First, the interpretation a scrap receives is one in which some kind of operator moves out of it—be it a degree operator, a relative clause operator, or a temporal operator. Second, the ACD generalization: scraps are restricted to appearing inside their antecedents, and cannot appear in any other environment—even when we control to ensure a fully parallel antecedent. Third, the size of the scrap is quite small: it must be able to contain root modals, which I assume are merged below sentential negation, but it cannot contain sentential negation. Finally, scraps must be c-commanded by their antecedents post-QR, as can be shown from close investigation of the relative scope of negation

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[17]Roger Schwarzschild (p.c.) provides the following example that seems to be a counterexample to the generalizations presented in this section. In particular, here we have a small antecedent, but high scope:

(i)   Carla needs it to <u>be warmer tomorrow than the weather report predicted</u> Δ.

Here, a reading is available where the antecedent is small, but the DegP can scope above the intensional predicate *need*. However, it's not entirely obvious that a scope theory is necessarily always the right way to model *de re*/*de dicto* readings (e.g. Percus 2000 a.o.), and it might even be possible that there are both scope and non-scope paths to *de re* (Deal 2018). Perhaps this sentence is one in which such a non-scope path to *de re* is available, in contrast to the other examples I provided. But at this point I cannot provide any more than pure speculation, and leave this issue aside for further research.

Another contrast between this example and the previous ones is that here we're getting a *de re* reading out of an *infinitival* clause, rather than a fully-finite CP—this may well be relevant for accounting for the differences here, though I leave this issue aside for now.

and scraps, as well as the correlation between *de re* and *de dicto* readings with the size of the antecedent for a scrap.

6.2 Enter: PRO$_{ModP}$

I argue that these facts all fall out of an analysis where the silent material in scrapping is a ModP-sized clausal anaphor, which I call PRO$_{ModP}$, to which an operator is adjoined: [$_{ModP}$ Op PRO$_{ModP}$]. What is PRO$_{ModP}$? It's an anaphor, much like *himself*, *herself*, and *each other*, meaning that it must be bound by a c-commanding antecedent. However, when I say "bind" in this case, I mean that it must copy its denotation from a c-commanding antecedent. Thinking of it a different way, PRO$_{ModP}$ must "refer" to the same semantic object as its antecedent. Note that this is not the standard notion of binding in semantics.[18]

To illustrate how this system works, I provide the derivation in (55). I'm assuming a very simple extensional semantics augmented with the Montague up operator ˆ.[19] I've boxed PRO$_{ModP}$ and its antecedent. PM stands for *Predicate Modification*, and IFA stands for *Intensional Function Application*.

In this derivation, the object *every painting Masha expected* starts out as the complement of *saw*, and then QRs to adjoin to the antecedent ModP, getting the scrap out of its antecedent ModP and leaving behind a lambda binder $\lambda 3$. After this step of QR, the antecedent ModP c-commands PRO$_{ModP}$, and the denotation of the antecedent is copied over to PRO$_{ModP}$. However, the node that c-commands PRO$_{ModP}$ is the node newly-created by QR that immediately dominates $\lambda 3$ and the original ModP—the node with the denotation $\lambda x.\textbf{saw}(x)(g_1)$. The resulting denotation of the sentence is as desired: for all x, if x is a painting and Masha expected Jen to see x, then Jen saw x.
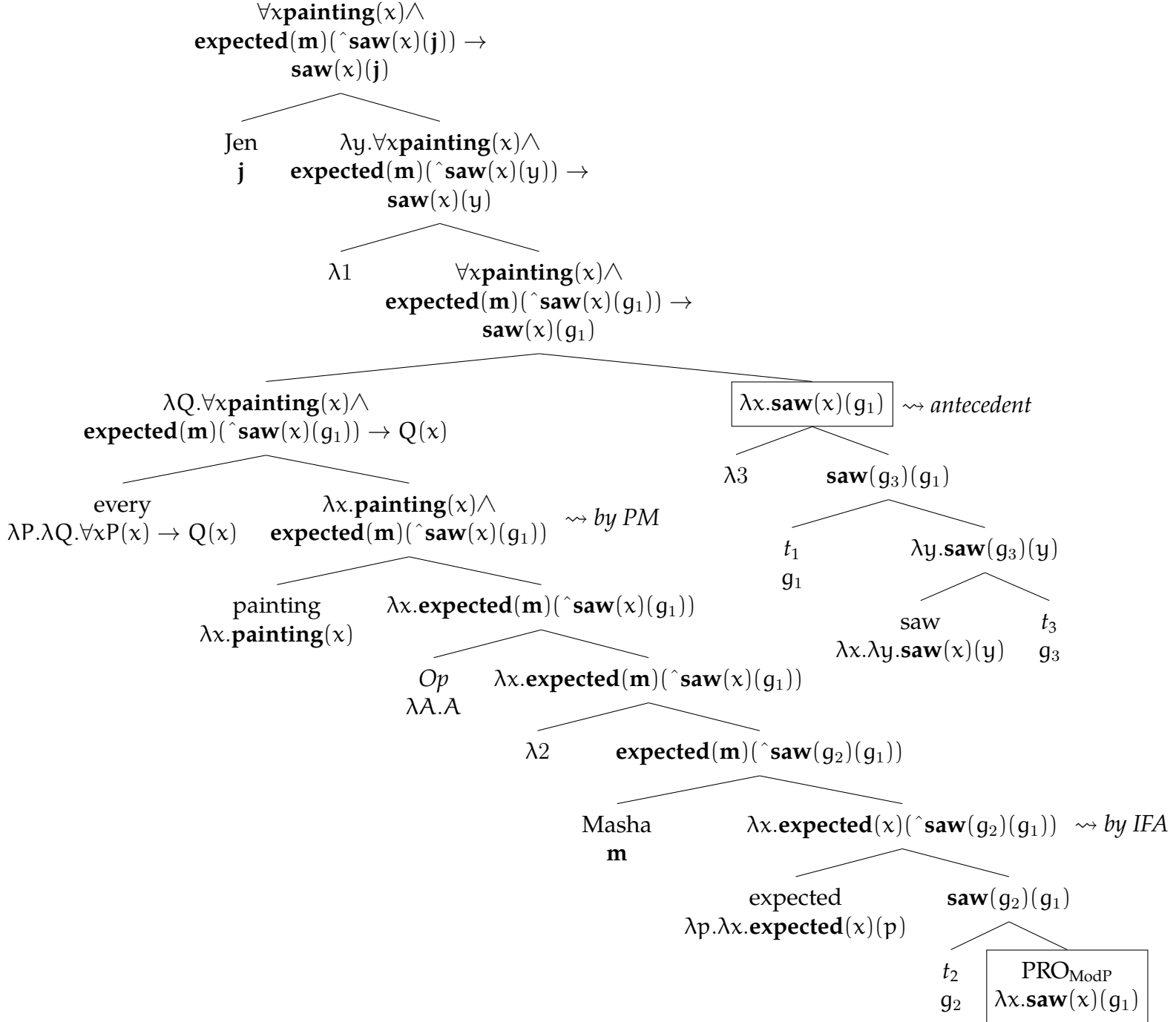
An important thing to note about this derivation is that the node that acts as the antecedent for PRO$_{ModP}$ actually includes within it a lambda binder. Since the quantifier *every painting Masha expected* has to QR in order to take scope, it creates a binder right below its landing site. Since this binder is included within the antecedent, the antecedent for PRO$_{ModP}$ necessarily has a predicate denotation, whose type depends on the type of the QRed quantifier—in this case, it's an et predicate, but in the cases of comparative and temporal scrapping, it would be a dt and an it predicate, respectively.

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[18]For those uncomfortable with the notion of "binding" here, it's possible to get PRO$_{ModP}$ to receive its denotation via regular semantic binding (though it'll need to be binding of a *predicate* variable) if you're willing to play a few compositional tricks, like base-generating lambda binders, or QRing PRO$_{ModP}$itself, etc. It's worth noting that, if you adopt the LF copying approach, scrapping would be an instance where *syntactic* and *semantic* binding come apart.

[19]This will need to be augmented later with a theory of how world and time variables get introduced and manipulated in order to derive the facts about temporal orientation, modality, and intensionality I discussed above. I leave this for further research.

(55)   *Jen saw every painting Masha expected Op* PRO$_{ModP}$.

$\forall x\textbf{painting}(x)\wedge$
$\textbf{expected}(\textbf{m})(\hat{}\textbf{saw}(x)(\textbf{j})) \rightarrow$
$\textbf{saw}(x)(\textbf{j})$

Jen
j

$\lambda y.\forall x\textbf{painting}(x)\wedge$
$\textbf{expected}(\textbf{m})(\hat{}\textbf{saw}(x)(y)) \rightarrow$
$\textbf{saw}(x)(y)$

$\lambda 1$

$\forall x\textbf{painting}(x)\wedge$
$\textbf{expected}(\textbf{m})(\hat{}\textbf{saw}(x)(g_1)) \rightarrow$
$\textbf{saw}(x)(g_1)$

$\lambda Q.\forall x\textbf{painting}(x)\wedge$
$\textbf{expected}(\textbf{m})(\hat{}\textbf{saw}(x)(g_1)) \rightarrow Q(x)$

$\boxed{\lambda x.\textbf{saw}(x)(g_1)}$ $\rightsquigarrow$ *antecedent*

$\lambda 3$ $\textbf{saw}(g_3)(g_1)$

every
$\lambda P.\lambda Q.\forall x P(x) \rightarrow Q(x)$

$\lambda x.\textbf{painting}(x)\wedge$
$\textbf{expected}(\textbf{m})(\hat{}\textbf{saw}(x)(g_1))$ $\rightsquigarrow$ *by PM*

t_1
g_1

$\lambda y.\textbf{saw}(g_3)(y)$

painting
$\lambda x.\textbf{painting}(x)$

$\lambda x.\textbf{expected}(\textbf{m})(\hat{}\textbf{saw}(x)(g_1))$

saw
$\lambda x.\lambda y.\textbf{saw}(x)(y)$

t_3
g_3

Op
$\lambda A.A$

$\lambda x.\textbf{expected}(\textbf{m})(\hat{}\textbf{saw}(x)(g_1))$

$\lambda 2$ $\textbf{expected}(\textbf{m})(\hat{}\textbf{saw}(g_2)(g_1))$

Masha
m

$\lambda x.\textbf{expected}(x)(\hat{}\textbf{saw}(g_2)(g_1))$ $\rightsquigarrow$ *by IFA*

expected
$\lambda p.\lambda x.\textbf{expected}(x)(p)$

$\textbf{saw}(g_2)(g_1)$

t_2
g_2

$\boxed{\begin{array}{c}\text{PRO}_{ModP}\\ \lambda x.\textbf{saw}(x)(g_1)\end{array}}$

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Because the antecedent for PRO_{ModP} is necessarily a predicate, PRO_{ModP} must then also receive a predicate denotation, given that it copies its denotation from its antecedent. However, this predicate denotation won't compose straightforwardly with an attitude predicate like *expect*—we need to convert it into a propositional type. In order to do so, I propose that an operator (of the correct type) adjoins to PRO_{ModP}, saturating its open argument slot, resulting in a type that can be then fed to an attitude predicate (via IFA). One could think of this operator-adjoining process as a Last Resort operation that's triggered in order to allow PRO_{ModP} to compose, though in this paper I won't pursue this Last Resort hypothesis in any depth. For the purposes of the paper, I just stipulate that an operator must be adjoined to PRO_{ModP}, and this operator does crucial work not only in allowing PRO_{ModP} to compose, but also itself later moving to create a relative clause (of entities, or degrees, or times).

This proposal straightforwardly accounts for the fact that scrapping maximally involves a ModP, and can maximally be anteceded by a ModP. Since PRO_{ModP} is of category ModP, it must be antecedent by another ModP. I also straightforwardly account for the c-command facts, since, being an anaphor, PRO_{ModP} must be bound by a c-commanding antecedent.

The obligatory operator movement fact requires more work to explain, but as I have discussed above, the movement involved in raising the scrap out of its antecedent results in the antecedent containing a lambda binder, thus receiving a predicate denotation. Once copied to PRO_{ModP}, this predicate needs to be saturated in order for PRO_{ModP} to compose with the rest of the derivation, and so we have to adjoin an operator to PRO_{ModP}.

The last fact that this analysis needs to account for is the ACD generalization. The astute reader might note at this point that my analysis doesn't by itself predict that scraps must be contained within their antecedents. Rather, it just predicts that scraps must be interpreted as sisters to their antecedent ModP, in order to be bound. If a scrap so happens to originate below ModP, then it must QR out of it. Thus, I only predict the ACD generalization in the case where scraps are first merged below ModP—they must move in order to be bound and escape antecedent-containment.

My analysis predicts that, in principle, if a scrap could be base-generated as a sister to matrix ModP, then scrapping should be licensed. However, in all the cases I'm aware of, constituents that could potentially license scrapping are always merged below ModP—for instance, *v*P adjuncts and arguments of the verbal predicate—and as such they will inevitably be forced to move in order to be bound. Thus, my analysis accounts for the ACD generalization for adjuncts and arguments that are first-merged below ModP. It rules out scrapping in adjuncts that are first-merged above their antecedent ModP (or ones that must obligatorily QR higher than ModP), as there is no way for PRO_{ModP} to get bound. My analysis also predicts that scrapping should be licensed in adjuncts that are first-merged directly adjoined to ModP. It remains to be seen whether this last prediction is verified.

6.3 Discussion

Here I'll provide some discussion about two broader issues raised by my analysis. The first has to do with modalized interpretations of scraps, in the absence of a modal in the antecedent, and the second has to do with why scraps are ModP sized in particular. This section is necessarily speculative, and should be read with the perspective of future investigation and research in mind.

6.3.1 Unanteceded modals?

As mentioned above, scraps often get readings that seem like the scrap must contain a modal of some sort:

(56) a. The queen arrived after we expected ⟨she ~~would arrive~~⟩.

   b. Bill left exactly when we agreed ⟨he ~~should leave~~⟩.

However, I've proposed that the scrap only contains a modal anaphor PRO_{ModP} and an operator, so where does this modal come from? There is no modal in the antecedent, so it can't be copied over onto PRO_{ModP}. I think there are two analytical options to pursue at this point.

   The first is that the appearance of an unanteceded modal is an illusion—there is no (semantically contentful) modal in the scrap, and the modalized reading comes from somewhere else. In particular, the modalized reading might be contributed entirely by the embedding predicate (Ogihara 1996, Katz 2001, 2004, a.o.). Thus, the future-shifting under *expect* is due to the semantics of the verb *expect*, rather than a future-shifting modal operator (i.e. *woll*, Abusch 1985, 1988, Wurmbrand 2014), and the deontic interpretation under *agree* should similarly be due to properties of *agree*, rather than the presence of a covert deontic modal inside the scrap.

   Alternatively, there *is* a covert modal in the scrap, and it is merged above PRO_{ModP} and the operator: [Mod [*Op* PRO_{ModP}]]. This syntax requires us to be able to have root ModP recursion, as well as the ability to have covert versions of all the kinds of modals attested in scraps. We could then account for the restriction on possible modal meanings in the gap using either pragmatic principles, or selectional restrictions imposed by the embedding verb. Adopting this kind of analysis would require us to carefully spell out exactly when and how ModPs can stack in order to avoid overgenerating unattested "multiply-modalized" readings.

   It remains to be seen which option is the most fruitful one to pursue. I leave this issue aside for further research.

6.3.2 Why ModP?

Though I haven't done any corpus work on this point, I suspect that scrapping is quite rarely attested in actual speech (especially noncomparative scrapping), much less in child-directed speech. There's probably not a lot of the relevant data for

learners to realize that scraps are ModP sized. This raises an important poverty of the stimulus question: how are learners able to learn that scraps are ModPs?[20] Ideally, we would like a theory that makes the learner positing a ModP-sized scrap epiphenomal on other, independent, more easily-acquireable principles and/or parameters. Another related question is whether there are other sizes of clausal anaphors.

Hardt (1999) and Schwarz (2000) argue that there is evidence that there are VP-sized null anaphors. One piece of evidence they put forth for this comes from the phenomenon of "ellipsis-containing antecedents" with VPE, where the antecedent for an ellipsis site itself contains an ellipsis site, and the "doubly-elided" VP can get a sloppy reading:

(57)   a.   When John had to cook, he didn't want to ⟨cook⟩.

       b.   When he had to clean, he didn't ⟨want to clean⟩ either.

                                                               (Schwarz 2000:162)

In (57a), it seems like we're eliding the VP ⟨cook⟩ under parallelism with the antecedent *cook*. That much is straighforward. However, this raises an issue for (57b). There, it seems like we're eliding ⟨want to clean⟩, but there is no antecedent anywhere in (57) that contains *want to clean*! To solve this puzzle, Hardt and Schwarz argue that the antecedent is *want to*, and the elided VP is interpreted as an anaphor bound by *cook*, which we can call PRO_{VP}.[21] This anaphor can then obtain a sloppy reading in (57b), being bound by *clean*, to result in the relevant reading. This analysis is schematized below in (58).

(58)   a.   When John had to cook$_1$, he didn't <u>want to PRO_{VP1}</u>.

       b.   When he had to clean$_2$, he didn't ⟨want to PRO_{VP2}⟩ either.

If we accept the argument that there must be a VP-sized null anaphor, then we've discoverd at least two kinds of clausal anaphors in English: PRO_{VP}, which can be found (if you look closely enough) in the domain of VPE, where it usually competes with an alternative derivation which involves PF-deletion of the elided VP; and PRO_{ModP}, which is found in scrapping, and doesn't compete with a alternative PF-deletion derivation, since there is no CP/ModP deletion in English that could result in the same surface strings as found in scrapping. So there might be a whole family of null clausal anaphors, containing at least PRO_{ModP} and PRO_{VP}. But why these, and not others? I can only offer speculation at this point.

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[20]I thank David Pesetsky (p.c.) for raising this important point.

[21]Though there is a c-command/locality issue here, as discussed by Hardt (1999), Schwarz (2000), and Elbourne (2008). Indeed, scrapping isn't actually licensed in this configuration:

(i)   (a)   *When John had to cook, he didn't want Δ.

      (b)   When he had to clean, he didn't Δ either.

I'll ignore this complicating issue here, though it does impact some of the speculative discussion in this section. In particular, it might suggest that there are no VP anaphors after all. But the core question still remains: why ModP, of all things?

One possibility is that there are syntactic restrictions on what can be a null clausal anaphor. David Pesetsky (p.c.) suggests that perhaps the family of null clausal anaphors is restricted to phrases that are "verb-like" enough in some relevant sense, and that modals are "verb-like" enough in English (e.g. they are part of the class of auxiliary verbs). There might be crosslinguistic variation in the set of projections that count as verb-like. For instance, some languages like Finnish employ an auxiliary verb construction in negation (Dryer 2005):

(59) a. *Sö-i-n   omena-a.*
          eat-PST-1SG apple-PART
          'I ate apples.'

      b. *E-n   syö-nyt   omena-a.*
          NEG-1SG eat-PTCP apple-PART
          'I didn't eat an apple.'

We might then predict that sentential negation could count as verb-like in the relevant sense, and maybe Finnish could have scrapping of NegPs.

Alternatively, we might try to derive the restrictions on the familty of null clausal anaphors from semantic properties of the relevant projections. One intuition that might be worth pursuing is that the clausal projections that can have null anaphor counterparts are those that interact with the VP event variable, in some relevant sense. For instance, in a (neo-)Davidsonian event semantics, the verb directly introduces an event variable. Additionally, following Hacquard (2006, 2010), root modals are anchored to the VP event, whereas epistemic modals are anchored to the *event of evaluation*. This could derive the fact that only root ModP can participate in scrapping, rather than a higher modal projection that hosts epistemic modals. In another way of thinking about things, null clausal anaphors can only be projections within the "event domain" of the clause. It remains to be seen how exactly we could cash out this intuition, and whether this even is the right kind of intuition to pursue.

6.4   Comparison with Kennedy and Merchant (2000b)

In this section, I compare my analysis of scrapping with the analysis of (comparative) scrapping put forth by Kennedy and Merchant (2000b), which is, as far as I know, the fullest analysis of this particular construction.

Our analyses are quite similar in a number of respects. Kennedy and Merchant (2000b) also argue that scrapping doesn't involves ellipsis *qua* PF-deletion, and they also show that scrapping cannot be reduced to NCA.

However, in contrast to what I argue for above, they propose that the missing complement involved in scrapping is a DP that ranges over propositions. The core data they use to motivate this analysis is the observation that passivizing the em-

bedding verb and inserting an expletive in subject position results in ungrammaticality:

(60) a. *The committee took much longer to decide than it was expected Δ.

b. *The mission turned out to be more expensive than it was originally predicted Δ.

c. *The storm inflicted an even greater amount of damage than it was first reported Δ.

d. *Jones published more papers than it was necessary Δ.

e. *Sally had a more serious problem than it was evident/apparent Δ.

As they note, this ungrammaticality is surprising, given that the unreduced counterparts of the examples in (60) are perfectly acceptable.

(61) a. The committee took much longer to decide than it was expected [that they would (take to decide)].

b. The mission turned out to be more expensive than it was originally predicted [that it would be].

c. The storm inflicted an even greater amount of damage than it was first reported [that it would (inflict)].

d. Jones published more papers than it was necessary [for him to (publish)].

e. Sally had a more serious problem than it was evident/apparent [that she had].

The final observation is that, when you remove the expletive subjects from (60), the sentences suddenly become grammatical:

(62) a. The committee took much longer to decide than was expected Δ.

b. The mission turned out to be more expensive than was originally predicted Δ.

c. The storm inflicted an even greater amount of damage than was first reported Δ.

d. Jones published more papers than was necessary Δ.

e. Sally had a more serious problem than it was evident/apparent Δ.

For Kennedy and Merchant (2000b), this data indicates that the gap in these constructions is nominal, and requires Case-licensing. They derive the ungrammaticality of (60) from the inability of this null complement DP to receive Case—since the embedding predicate is passive/adjectival, it cannot assign accusative to its complement, and since the subject position is occupied by expletive *it*, the null DP can't receive nominative either. Thus, it can't get Case-licenced, and that results

in ungrammaticality. The sentences in (61) are grammatical because there is no DP in the complement position of the embedding predicates, and the expletive-less sentences in (62) are grammatical because the null DP is free to receive nominative case. They suggest that this null propositional DP the silent counterpart of the *what* that can appear in similar environments, which seems to show a similar sensitivity to Case-licensing:

(63)   a.   What was (*it) necessary/expected/predicted/reported?

     b.   The committee took much longer to decide than what (*it) was expected.

In terms of the semantics of this null counterpart of *what*, they are somewhat vague, writing the following:

> [T]he semantic value of ~~what~~...must be a propositional expression that contains a free variable over degrees (or amounts)...the value of [~~what~~] must be contextually determined, anaphoric to the open degree term given by the main clause...we leave open here the mechanism by which this anaphoric dependency should be resolved...
>
> <div align="right">Kennedy and Merchant (2000b)</div>

To illustrate the intuition, they provide the following abbreviated derivation of a sample degree phrase:[22]

(64)   Jones published more papers [than ~~what~~ Smith thought t].

     a. $[\![$than ~~what~~ Smith thought $t]\!]^g = \iota d.\mathbf{thought}(\text{Smith}, [\![\text{what}]\!]^g)$

     b. $[\![\text{what}]\!]^g = \exists x\,[\mathbf{paper}(x) \wedge |x| = d \wedge \mathbf{published}(\text{Jones}, x)]$

     c. $[\![64a]\!]^g = \iota d.\mathbf{thought}(\text{Smith}, \exists x\,[\mathbf{paper}(x) \wedge |x| = d \wedge \mathbf{published}(\text{Jones}, x)])$

In this sentence, they assume that ~~what~~ is able to contextually receive the denotation in (64b), though they do not spell out how this works in detail.

This is the core issue I have with their analysis. As I've shown above, there are very specific restrictions on the antecedent and the scrap: they must be maximally be a ModP sized, the scrap must be contained within its antecedent, and the scrap must QR to be adjoined to and c-commanded by its antecedent. In a way, my analysis is a way of spelling out exactly how a scrap receives its denotation: the gap is a ModP that denotes a predicate, anteceded by another ModP that must c-command it at LF, with an operator adjoined to it.

In order to spell out how scraps receive their denotations, I've had to assume that scraps are ModPs, rather than DPs, in order to get them to be anteceded by the right category. In doing so, I don't have a straightforward account of Kennedy and Merchant's observations about passivization and expletive *it* in (60-62). In

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[22]They assume that *than*-phrases denote degrees, rather than predicates over degrees, but it's straightforward to convert their denotations to whatever theory you prefer.

principle, you could imagine an alternative version of my analysis where PRO$_{ModP}$ is a DP, but you would have to somehow ensure that this DP can only be anteceded by a ModP, rather than any other kind of propositional node. It's unclear to me at this point how this could be achieved except by mere stipulation. Though perhaps, if one is able to spell out a principled theory of why this DP can only be antecedent by a ModP, this might go some way in trying to solve the poverty of the stimulus problem described above. I leave this for further research.

It's also unclear to me whether their analysis can be extended to non-comparative scrapping, which shows certain distinct behaviors from comparative scrapping. For instance, overt *what* cannot appear in non-comparative scrapping:

(65) a. The treasure was found where (*what) I expected.

  b. Akshay turned in his homework when (*what) I expected.

  c. The dance began after (??what) I expected.

If scrapping is only the null counterpart of propositional *what*, how do we account for the contrasts in (65)?

Additionally, while inserting an expletive subject and passivizing the embedding verb or having the embedding predicate be an adjective are also unacceptable in non-comparative scrapping, removing the expletive subject doesn't make the resulting sentences any more acceptable:

(66) *Expletive subject*

  a. *The treasure was found where it was expected/certain.

  b. *Akshay turned in his homework when it was expected/certain.

  c. *The dance began after it was expected/certain.

(67) *No expletive subject*

  a. *The treasure was found where was expected/certain.

  b. *Akshay turned in his homework when was expected/certain.

  c. *The dance began after was expected/certain.

The DP analysis would derive the ungrammaticality of (66) from the inability of ~~what~~ to get Case—however, that predicts that (67) should be grammatical, counter to fact.

One way of reconciling Kennedy and Merchant's observations about comparative scrapping with these observations about non-comparative scrapping is to say that there are two paths to scrapping: one of them is Kennedy and Merchant's ~~what~~, found only in comparatives, and the other is PRO$_{ModP}$, found in a broader range of ACD contexts (which includes comparatives). Some preliminary evidence for this conclusion comes from the fact that the acceptability of non-comparative scrapping seems to vary idiolectally—there are people who simply do not accept non-

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comparative scrapping, but, as far as I am aware, there isn't anyone who doesn't accept comparative scrapping. While this dialectal variation deserves further study, both qualitative and quantitative, I think it suggests that all English varieties have a null version of propositional *what*, whereas only some have PRO$_{ModP}$. Those whose grammars don't contain PRO$_{ModP}$ thus accept comparative scrapping, but do not accept non-comparative scrapping.

7   Conclusion

This paper has investigated an understudied elliptical construction that I call scrapping. I've introduced some of the core empirical facts that any analysis of the phenomenon needs to address: the fact that scrapping obligatorily involves operator moement; the ACD generalization; the fact that scraps are interpreted as if they were structurally-reduced, without independent tense and also without negation (but potentially containing root modals); and the c-command generalization. I've argued that these facts point to a particular analysis of scrapping: it involves a null clausal anaphor that I've named PRO$_{ModP}$ which syntactically and semantically behaves like a (reduced) clause.

Taken more broadly, this study of scrapping can be taken as an argument that ellipsis/surface anaphora can't always be reduced to a mechanism of PF-deletion—rather, the grammar also has available anaphoric ways of getting the same surface result, where the gap contains a null anaphor that must be bound by a local linguistic antecedent. Previous work arguing for a similar conclusion, such as Chao (1987) and Schwarz (2000), examines the case of VPE. However, VPE has the complicating issue of there being available an independently-necessary PF-deletion derivation, and alternative analyses can be found for the VPE facts that motivate a bound anaphor analysis (e.g. Hardt 1999, Elbourne 2008). The striking thing about scrapping is that *there is no alternate PF-deletion analysis*—there is no CP (or ModP) ellipsis in English. Thus, the case of scrapping presents a strong argument for the necessity of bound-anaphor derivations for (certain kinds of) ellipsis, as well as more broadly for the existence of clausal anaphors.

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