Copies

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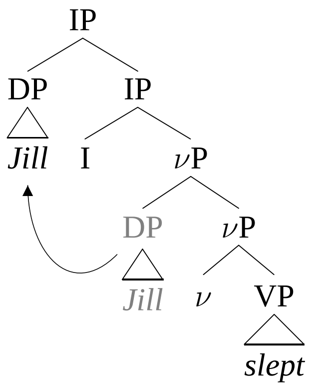
After offering a slight modification of the version of the copy theory of movement in Fox (2002), I investigate how that theory would deal with semantically vacuous movement. It can't. I conclude that semantically vacuous movement cannot involve the same operation that produces copies. Instead, I propose that it is a perversion of the linearization algorithm that translates syntactic representations into strings, and I formulate that perversion.

1. *Introduction*

Let's start with the assumption that the movement relation in syntax creates copies of the term that is moved. There are a variety of ways to work how how this is achieved. I don't think it will matter for what follows which of those is chosen. I will express the copy theory of movement with the use of shading. Movement of the subject DP in (1) from Specifier of νP to Specifier of IP will create the representation shown in (1b), where the shaded *Jill* is an unspoken copy.

(1) a. Jill slept.

b. 

Expressing movement in terms of copies allows for an articulated control over how movement interacts with the semantic interpretation. It provides for the possibility of "reconstruction" effects, in which the item that is moved is either partly or wholly interpreted in its pre-moved

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position. At the same time it allows moved phrases to be semantically interpreted in their post-moved position. It does so, however, by producing syntactic representations in which a moved item is present in all of the positions it moves to or from and this leads to the expectation that a moved item will be interpreted in the same way in all of these positions. This is not what happens, however, and so the copy theory of movement must be wedded to a view of the syntax/semantics interface that allows for slight differences in how copies are interpreted.

The goal of this paper is to investigate the methods now in the literature for achieving this. I'll divide the cases we look at on the basis of where the copy that is spoken sits relative to the other copies. We'll begin by looking at those cases in which the lower copy is spoken. These are instances of "covert movement," where the term that is moved does not result in a change in the position that term is pronounced. Then we will look at those cases in which the copy that is spoken is higher than other copies. These are the classic examples of movement, in which the item that moves has had its spoken position changed thereby. I will argue that the first set of cases demand a way of thinking about the semantic interpretation of copies that the second set of cases cannot coexist with. We'll need a new theory of copies, I think, and so I'll sketch one to account for the second set of cases.

2. *First Case: a lower copy is pronounced*

The classic examples of this are instances of Quantifier Raising (QR)[1] and *wh*-in-situ[2]. I'll focus on the QR cases here. QR has several interesting features. It allows a quantifier to be interpreted in a position higher than where it is pronounced, as in (2), and it also allows a relative clause associated with a quantifier to be interpreted higher than where it is pronounced, as in (3).

(2) A syntactician [$_{\text{VP}}$ visited every philosopher].
 = every philosopher $>$ a syntactician

(3) A syntactician [$_{\text{VP}}$ visited every philosopher that a phonologist did Δ].
 Δ = visited x

We know that the relative clause in (3) is interpreted outside of the VP it stands in because that is required to resolve the ellipsis it contains.

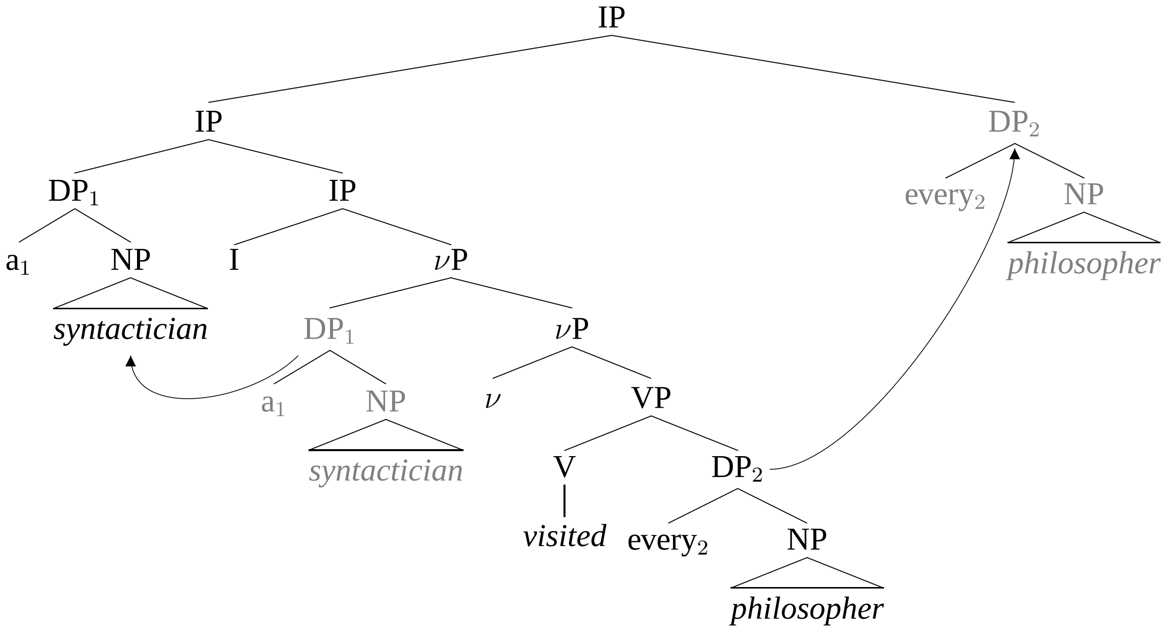
QR does not allow the NP associated with a quantifier to be interpreted higher than where it is pronounced, however. This can be seen by observing that material within that NP triggers Principle C effects with respect to the position it is spoken in.

(4) * She$_1$ [$_{\text{VP}}$ visited every friend of Mary's$_1$].

I'll adapt an account of this paradigm found in Fox & Nissenbaum (1999) and Fox (2002). The account employs the bottom-up derivations proposed in Chomsky (1995a), the copy theory of movement[3] and the single-output view of the syntax/semantics interface.[4] For (2), QR produces a representation like (5).

[1]See May (1977, 1985).
[2]See Chomsky (1977) and Huang (1982).
[3]See Chomsky (1995b).
[4]See, among others, Bobaljik (1995).

(5)



This representation treats referential indices as features that are brought into the derivation by determiners and are projected onto the phrases those determiners head. Indices play an important role in interpreting these structures. In Danny Fox's work, it is the interpretation of indices that plays the central role in determining how copies are interpreted differently. Let's start with the rules in (6); (6b) is from Fox (2003), with antecedents in Sauerland (1998).

(6) a. Let { n, n′, . . . , n^m } be indices on the same projection line. Only one n needs to be semantically interpreted.

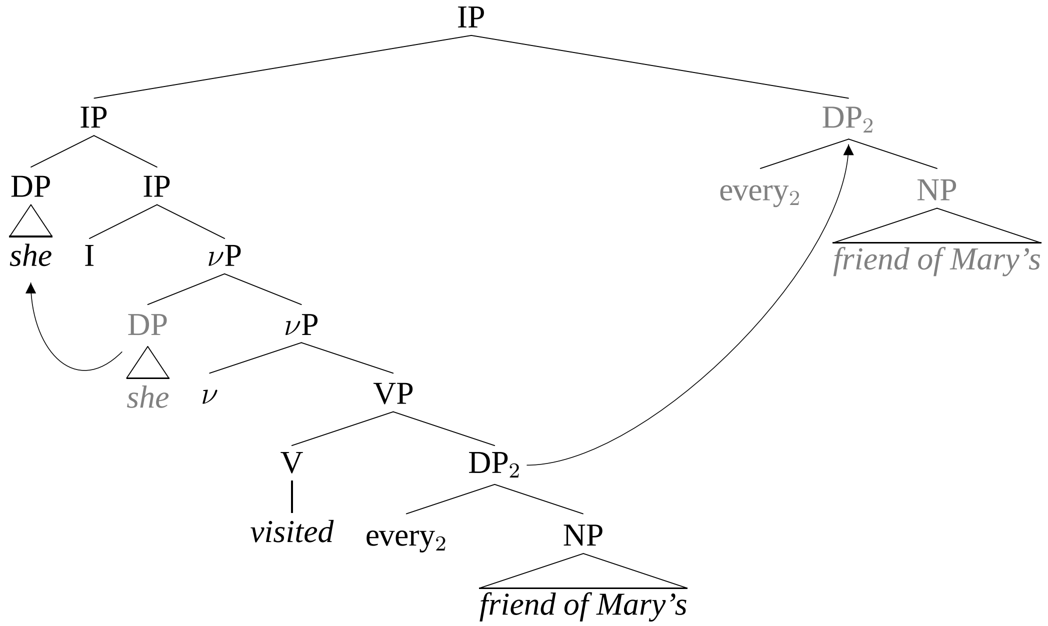
b. TRACE CONVERSION

For [ϕ' YP$_n$ ϕ], interpret ϕ as a function that maps an individual, x, to the meaning of ϕ[x/n].

ϕ[x/n] is the result of replacing the head of every constituent with the index n in ϕ with the head *the*$_x$, whose interpretation, $[\![\text{the}_x]\!]$, is. $\lambda P.\ [\![\text{the}]\!](P \cap \lambda y.y = x)$.

Fox sees (6b) as a version of Heim & Kratzer (1998)'s method of interpreting indices as lambda converters. It lets the index on a phrase turn that phrase into a binder, in the normal way, and makes the index on a determiner convert that determiner into a kind of restricted bound variable. In a simple example like (7), for example, it would deliver an interpretation that could be paraphrased with (8).

(7)



(8) every x: FRIEND-OF-MARY'S(x) is such that she visited the y: FRIEND-OF-MARY'S(y) & $y = x$.

Applied to (5), (6b) will deliver an interpretation in which *a* is interpreted within the scope of *every*, but at the same time it will preserve the Principle C effect in (7).

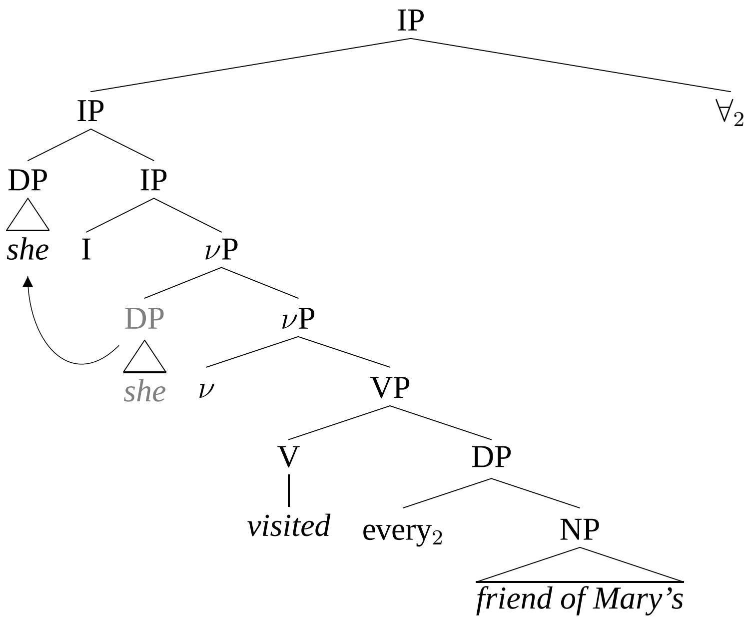
Fox's Trace Conversion rule bothers many. It has the nettlesome property of letting a whole class of lexical items — determiners — be ambiguous. And it resolves that ambiguity contextually by syntactic rule, something not seen elsewhere. So let me offer a variant of Fox's proposal that avoids these consequences before turning to explain the rest of the paradigm in (2)–(4).

This variant builds on ideas many have had about the syntax of quantification.[5] Perhaps it's closest to ideas in Beghelli (1993, 1995), Sportiche (2003), Butler (2004) and Adger & Ramchand (2005). Imagine, as in Matthewson (2001), that Quantificational expressions make use of two functional heads. One has the denotation of quantifiers,[6] and the other is a choice function that provides the domain for the quantification. For concreteness, we can assume this choice function to have just the meaning given to determiners by Fox's Trace Conversion rule. Unlike Matthewson, but like those cited above, let's separate these two functional heads, putting the term that expresses the quantification in the position where its scope is computed, while the choice function is in construction with the NP. The morphological form of the choice function varies depending on the quantificational term. Let's follow Kratzer (2005) and Adger & Ramchand (2005) and let this dependency be mediated by AGREE. AGREE will determine the morphological form of the choice function part, and make both heads share an index. This proposal would give to (4) the representation in (9) before the object QRs.

[5]See, e.g., Williams (1986, 1988), the papers in Szabolcsi (1997), Hallman (2000) and Kratzer (2005).

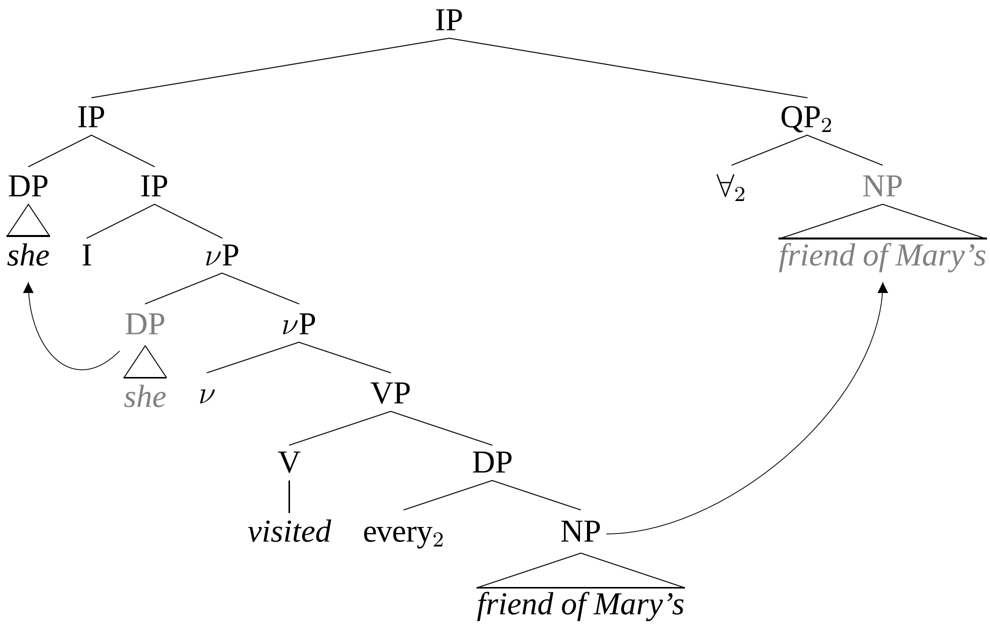
[6]In her syntax, quantifiers combine directly with the DP headed by the choice function, and so she adjusts the denotation of quantifiers to be of semantic type ⟨e, ⟨⟨e,t⟩,t⟩⟩. My syntax will differ, allowing them to be of the more traditional ⟨⟨e,t⟩,⟨⟨e,t⟩,t⟩⟩ type.

(9)



QR produces (10).

(10)



This variant of Fox's proposal preserves his syntax and semantics, but does not require a syntactic rule that rewrites the semantics of lexical items. It also straightforwardly derives the necessary (11).

(11) The restrictor for a quantifier must be interpreted within the scope of that quantifier.

Other semantic treatments are possible with only slight differences in the syntax. What I will say here fits a family of accounts, then.

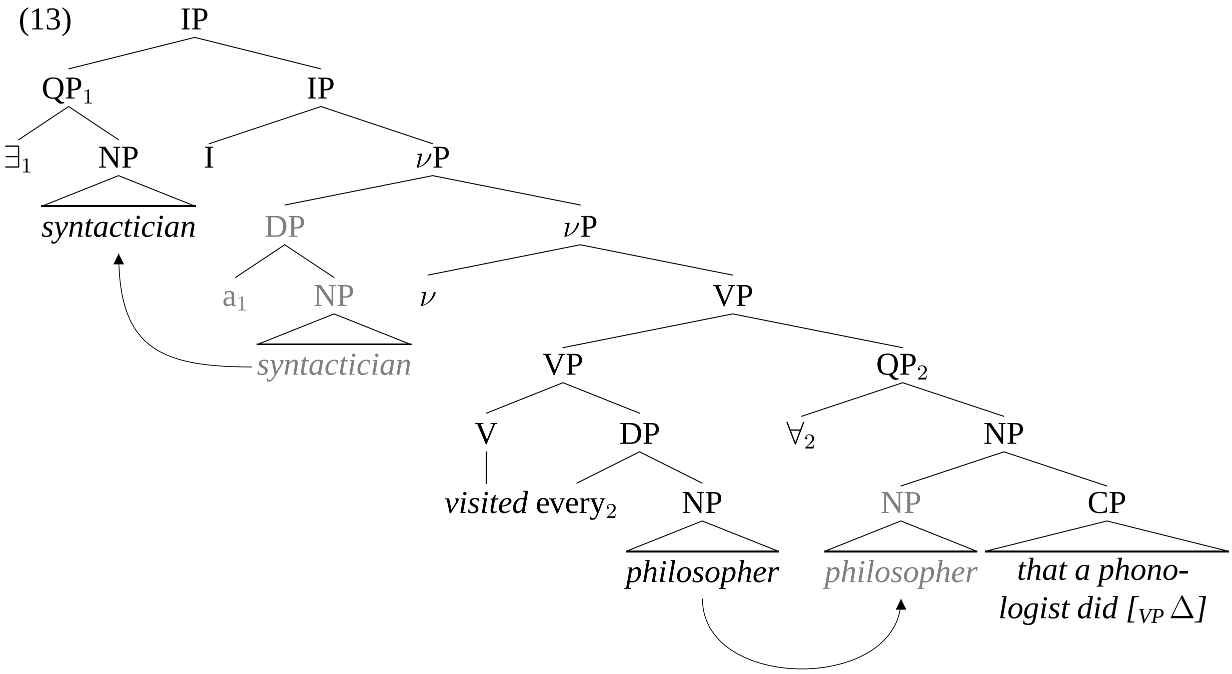
Back to the paradigm in (2)–(4). The account of (2) vs. (4) requires that a spoken copy be interpreted semantically and this, in turn, requires that the relative clause holding the ellipsis in (3) not be pronounced within the VP that serves as the antecedent for the ellipsis.

Fox & Nissenbaum (1999) argues that this is correct, producing an analysis that builds on Baltin (1987)'s proposal that extraposition produces the surface syntax which licenses antecedent contained deletions. There is independent support for this conjecture from alternations like those in (12) (originally from Tiedeman 1995).

(12) a. * I [$_{VP}$ said that everyone you did Δ arrived].
b. I [$_{VP}$ said that everyone arrived] that you did Δ.
(Fox 2002:(35b), (36b), 77)

The surface position of the relative clause in (12a) does not allow the ellipsis it contains to be outside the root VP, its antecedent, as required. By contrast, the surface position of the extraposed relative in (12b) is, conceivably, outside the root VP and as a consequence the ellipsis it contains can find a suitable antecedent.

On this account, then, the relative clause in (3) will have string-vacuously extraposed out of the VP that furnishes the antecedent for the ellipsis. Fox and Nissenbaum argue that relative clause extraposition arises by merging the relative clause to a QRd copy of the DP it modifies. Thus, (3) will have a representation like (13).

(13)


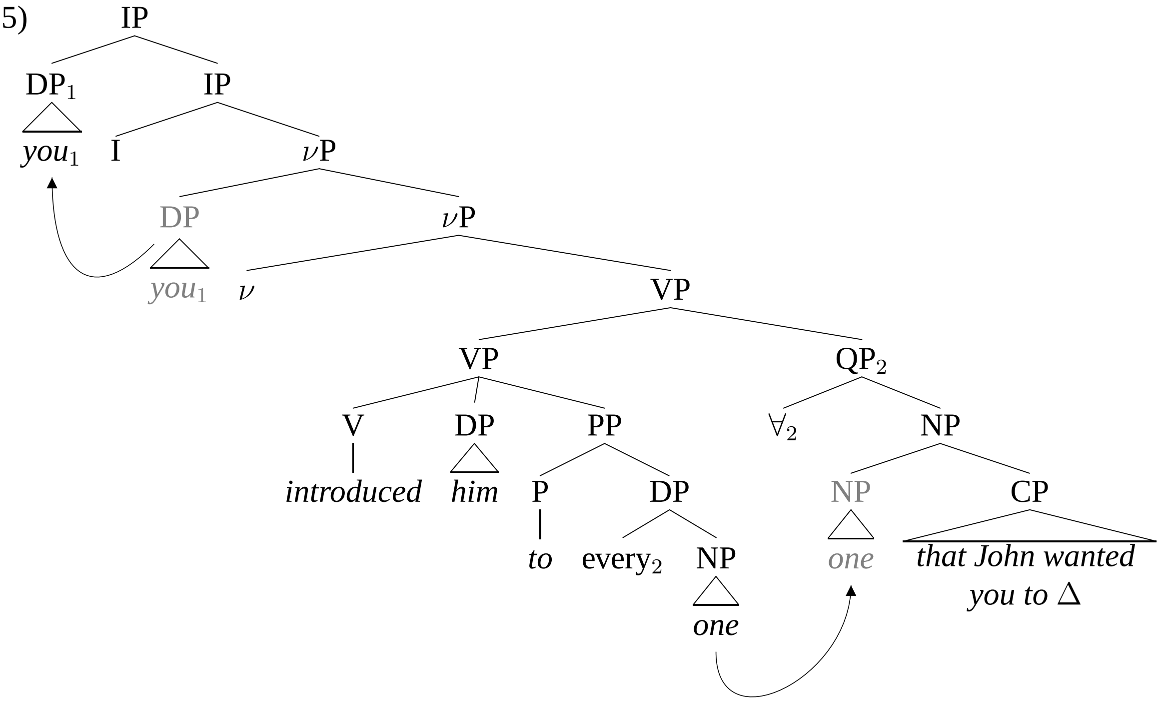
Our semantics gives this representation the right interpretation and correctly resolves the ellipsis.

As Fox notes, interesting confirmation for his account, and my variant of it, comes from the alternation in (14), discovered by Fiengo & May (1994).

(14) a. * You introduced him$_1$ to every friend of John's$_1$ that I wanted you to Δ.
b. * You introduced him$_1$ to everyone that John$_1$ wanted to you to introduce him to.
c. You introduced him$_1$ to everyone that John$_1$ wanted you to Δ.
d. ?? You introduced him$_1$ to everyone yesterday that John$_1$ wanted to you to introduce him to.

In (14a) we see the familiar Principle C effect for material within the NP, and in (14b) we see that it holds for names within the relative clause as well. In (14c,d) we find that the Principle C effect for material within the relative clause is lifted when that relative clause has an ellipsis to resolve, and that it is weakened when that relative clause extraposes. I don't know why there is a difference between (14c) and (14d), but that they should both fall on the side of grammaticality is expected on Fox's proposal. They will get a representation like (15), which does not produce a Principle C effect with *him* and *John* as they are not in a c-command relation.[7]

(15)



As the ungrammaticality of (14b) highlights, this account requires that we find a way of preventing string-vacuous extraposition of the relative clause unless an ellipsis requires it. We need to find something that generally prevents string-vacuous extraposition, and then something about ellipsis that overrides this prohibition. To prevent string-vacuous extraposition, I suggest a trans-derivational constraint which favors the "quickest" derivational path to a given Spell-Out, along the lines of Pesetsky (1989)'s Earliness Principle. I'll formulate the condition as follows.

(16) EARLINESS
Let D={ D_1, D_2,…, D_n } be the well-formed derivations from a fixed Numeration, N, to a fixed Spell Out, S, and let $|D|$ be the number of applications of operations in D. Every $D \in D$ for which there is a $D' \in D$ such that $|D'| < |D|$ is ungrammatical.

Earliness compares all the ways that the syntax can create the same string from a given set of terminals and throws out all those that take more steps than necessary. Because extraposing the relative clause in (14b) produces the same string that would be created by failing to extrapose the relative clause, Earliness will block the outcome that involves extraposition. Extraposition necessarily involves more steps.

[7] This VP, like many that follow, is artificially flat.

When the relative clause contains an ellipsis, however, Earliness must permit string-vacuous extraposition. What makes ellipsis special, I conjecture, is that it invokes an unusual requirement on Spell Out. To know whether a VP can be Spelt Out as silence, the denotation of that VP must be computed and matched with an antecedent. One might think of this in the same way that we think of the Spell Out of lexical items, where it is also necessary to access the denotation of some term to know what its phonological form is. Consider ellipsis to be a Spell Out instruction that arises when a particular semantic condition is met, a way of conceiving of ellipsis that can be found in Merchant (2001). We might do this by letting the syntax determine the placement of a feature on certain phrases, let's call this an "e-feature," which invokes a Spell Out along the lines of (17).

(17) Spell Out(XP_e) = silence and is defined only if $[\![XP]\!]$ has an ellipsis antecedent.

An e-feature on a phrase prevents Spell Out from interpreting that phrase in its normal way, and instead makes Spell Out render it as silence. It also makes Spell Out a partial function, requiring that XP to have an antecedent of the sort that is appropriate for elided phrases. This will allow a phrase with an e-feature to have a Spell Out only if its ellipsis is resolved. For (14c) this means that the relative clause must extrapose if it is to be spelled out, since that is the only way the ellipsis it contains can find an antecedent and become subject to (17). There is no way of spelling out (14c), then, that does not involve extraposition. This removes the shorter derivations which normally block string-vacuous extraposition. String-vacuous extraposition of relative clauses is possible, then, when doing so is needed to resolve an ellipsis.

This completes my review of those cases in which the lower copy of two (or more) copies is pronounced. These cases require a very particular view of how copies are interpreted semantically, as well as certain tenets about the syntax, such as Earliness, and the interpretation of ellipsis in (17). It also requires the following.

(18) THINGS NEEDED

a. A mechanism for producing copies of terms in syntactic representations. This could be achieved by letting merge fashion identical phrases that share an index, as in Chomsky (1995b), or by letting movement be understood as giving a single phrase more than one syntactic position, as in Engdahl (1986).

b. A principle that allows some copies to be ignored by the phonological interpretation of sentences. This requires a principle that forces certain copies to be silent. Perhaps a combination of Earliness with a phase-based timing of Spell Out, such as is proposed in Nissenbaum (2000), will do the trick.

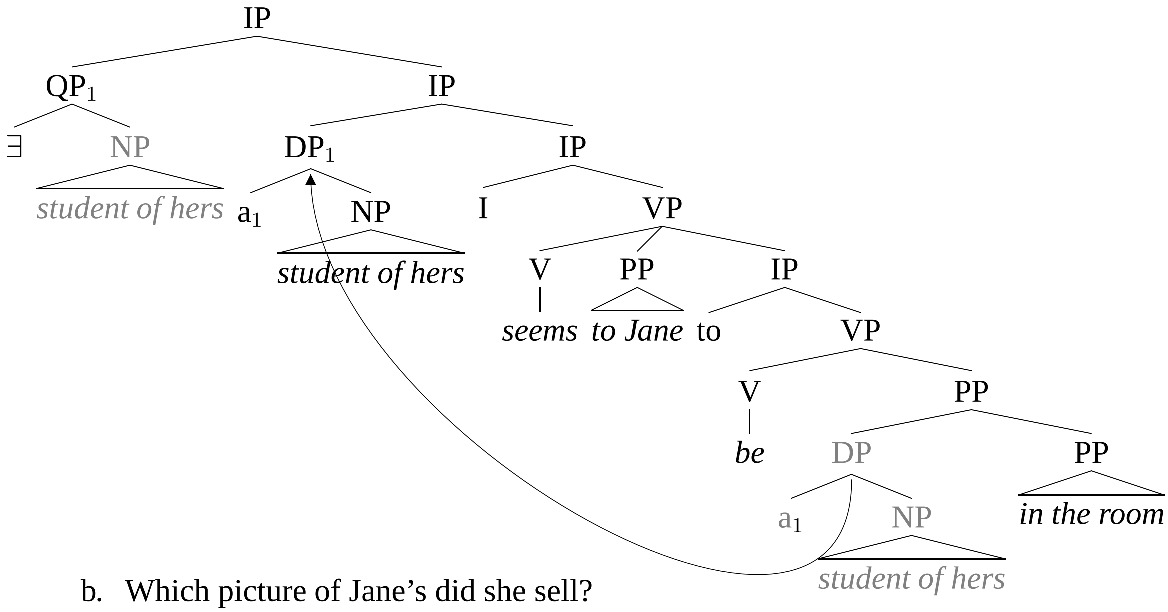
c. A principle that forces all copies to be semantically interpreted.

I will not have much to say about how these needs are satisfied. What I will try to show is that not all instances of movement can satisfy (18) with the semantics we have reviewed here.

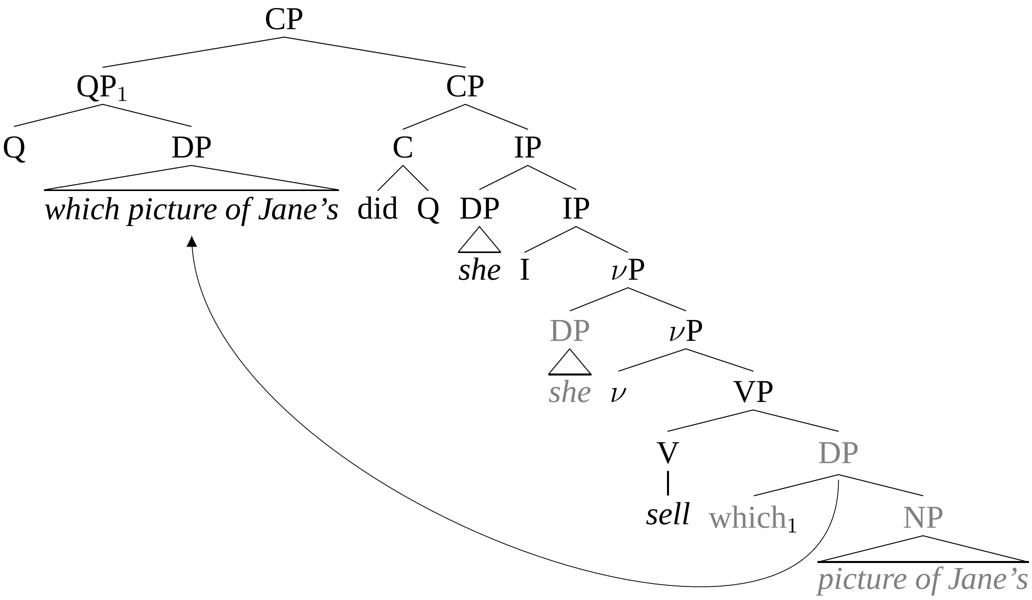
3. *Second Case: a higher copy is pronounced*

The system I've adopted works not only for all cases where a phrase is interpreted higher than where it is pronounced, but it also works for some cases where a phrase is interpreted lower than where it is pronounced. The examples in (19), for instance, get the correct interpretations from the representations indicated.

(19) a. A student of hers seemed to Jane to be in the room.



b. Which picture of Jane's did she sell?



In (19a), a spoken copy of *a student of hers* is in the Specifier of the root IP, and binds a restricted variable within the infinitival clause. This is achieved by letting the index on the spoken copy be interpreted as a binder, and letting the lower, unspoken, copy get an interpretation like that we've given to the spoken copies in the previous section: the determiner is a kind of variable, and the NP a restriction. Interestingly, in this example, the spoken copy is also interpreted as a restricted variable, as it is the lower copy created by QR. In this example, then, we see how a copy can be interpreted as both binder and variable.

In (19b), *which picture of Jane's* has wide scope, but the restriction on its variable provided by the unspoken copy induces a Principle C effect between *her* and *Jane*. We will have to see questions like (19b) as having a syntax along the lines that we developed for quantifiers in the previous section. But the semantics will have to be slightly different. We cannot give the determiner *which* the same restricted-variable denotation that we have given other determiners. While doing so would be fine for those instances of *which* that are bound — like the unspoken copy of *which* in (19b) — it would screw things up for those instances of *which* that are not bound — like the spoken copy of *which* in (19b). We will have to find a denotation for *which* that allows it to be interpreted in both the bound and unbound positions. There are a variety of possibilities on the market. One would be to preserve the basic idea that determiners are restricted variables, or choice functions, and combine that with a denotation for the question quantifier, Q, in (19b) that binds off both the higher and lower instances of *which*. Another possibility would be to exploit an alternative semantics, and let *which* introduce (restricted) alternatives that are closed off by Q along the lines described by Kratzer & Shimoyama (2002) or Beck (2006). This is not the place to decide among these alternatives, and so I will remain vague about the semantics of questions. Nonetheless, I hope it is clear how the theory of copies developed in the first section on the basis of quantificational DPs might be extendable to cases of question DPs like (19b).

In these cases where a higher copy is pronounced, then, the account sketched in the first section applies correctly. But there are cases of a pronounced higher copy where these mechanisms fail to deliver the right interpretations. Here are a few.[8]

(20) a. Spätzle ißt Thilo regelmäßig.
spätzle eats Thilo regularly
'Thilo eats gobs of spaetzle.'

b. A student of hers seemed to every professor to be in the room.

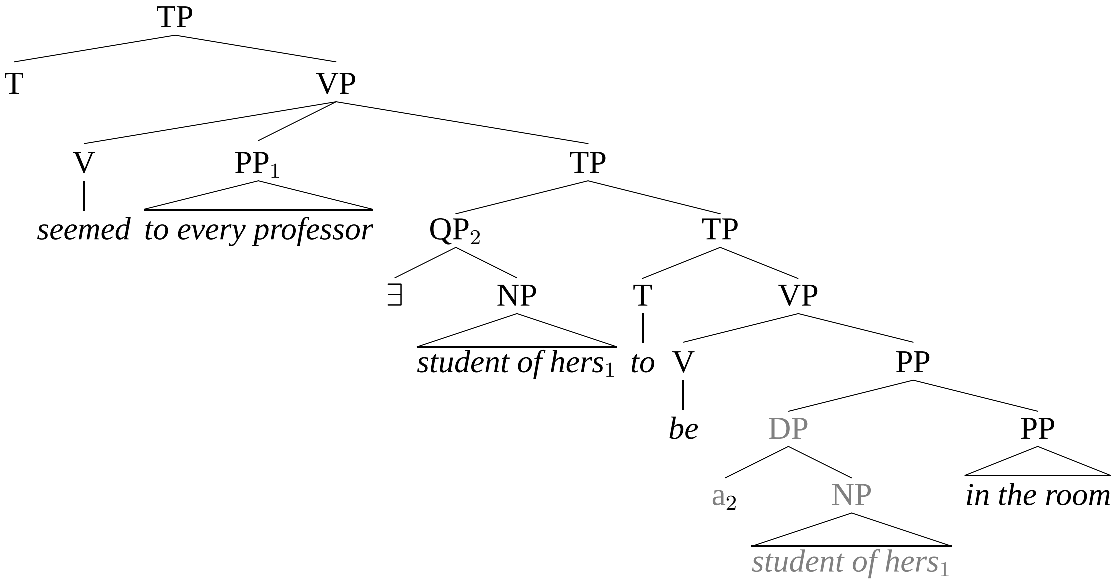
c. A student of Jane's seemed to her to be in the room.

Each of these cases can get an interpretation in which the spoken copy is not semantically interpreted; only an unspoken copy is interpreted. In (20a), for example, the meaning of *ißt* is not computed at the position it is spoken. Only the copy of *ißt* in the underlying position is interpreted by the semantics. The same is possible in (20b) and (20c) too.

There are two interpretations of (20b) in which *a student of hers* is similarly not interpreted in its spoken position. On both of these interpretations, *her* is bound by *every professor* and the existential quantifier associated with *a* is interpreted within the scope of the universal quantifier associated with *every*. If the *student*-DP is interpreted inside the infinitival complement, for instance, what we require from our present system is a representation like (21).[9]

[8] The cases in (20b) and (20c) are discussed in Hornstein (1995), Fox (2002) and Sauerland & Elbourne (2002).
[9] I've assumed that the index '1' that *every* brings with it has projected up to the PP *to every professor*.

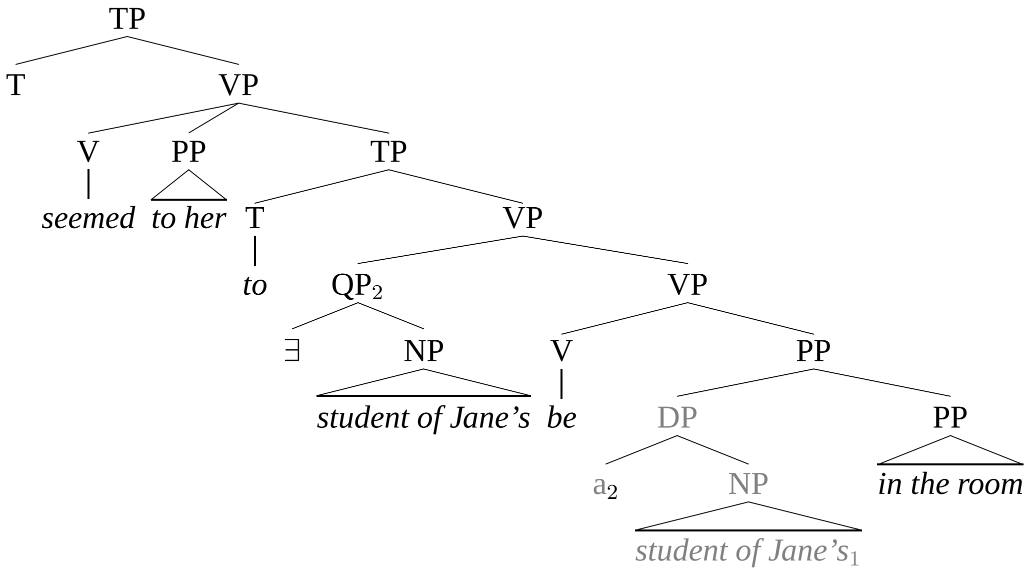
(21)



For *her* is bound by *every professor*, the present system requires a representation in which, like (21), there is no copy of *her* in the position that we actually speak it.

Similarly, (20c) has an interpretation in which the *student*-DP is interpreted within the infinitival complement: its world variable is bound by *seem*. On this interpretation *Jane* and *her* invoke a Principle C effect,[10] and the existential quantification associated with *a* has narrow scope. Our present system requires a syntactic representation like (22) for such a meaning.

(22)



As with (21), this representation does not put a copy in the position where one is spoken.

These are instances of "total reconstruction."[11] They flout (18c): the requirement that every copy be semantically interpreted. Without this requirement, we would lose the fact that QR does

[10] One issue I will dodge in this paper is why Principle C effects are not invoked in all cases of Argument Movement. On the wide scope interpretation of (20c), for instance, *Jane* and *her* may easily corefer. I think Takahashi (2006)'s proposal — that the NP of a DP may merge late — provides a plausible account.

[11] See May (1977) and Sauerland & Elbourne (2002).

not bleed Principle C effects, as we've seen in the previous section. We need to explain, then, why these cases are different. So far as I know, all the cases where copies are not semantically interpreted are ones in which they are spoken and higher. At a minimum, then, we should explain (23).

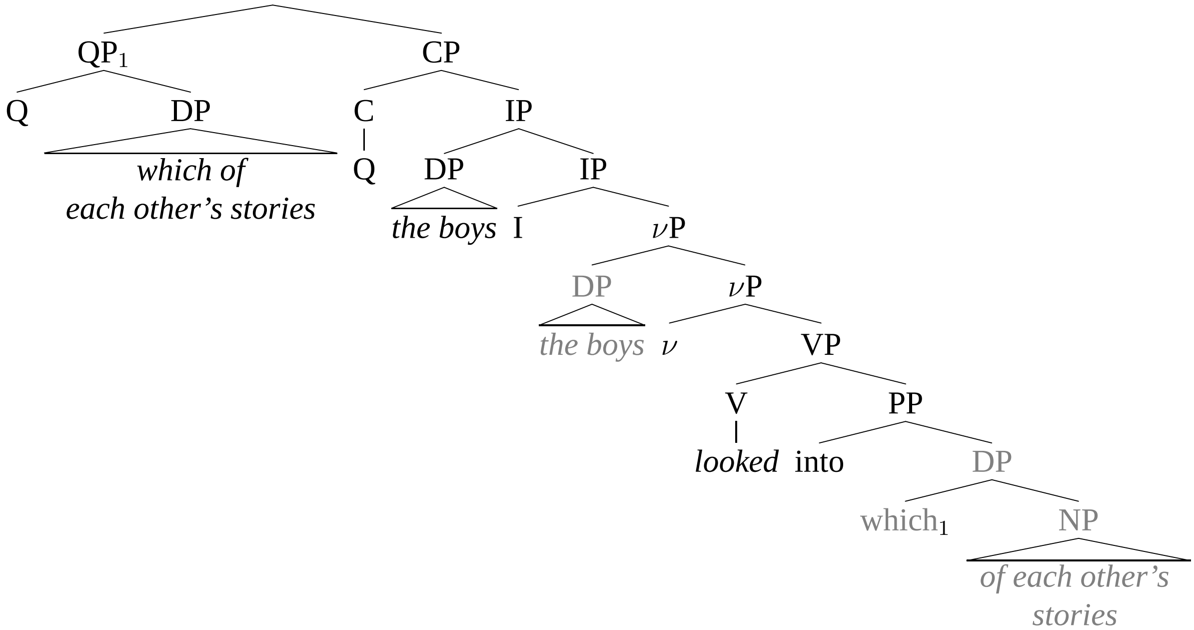
(23) If there are two or more copies of α, then the pronounced copy must be semantically interpreted unless it is the highest one.

The traditional account for (23) is to let movement create representations that are not semantically interpreted. The spoken copies in (20), for example, could be manufactured after the representations indicated above have gotten their final semantic interpretation. This was captured by the "Y" model of grammar, or its phase-based variants,[12] by allowing there to be a parse that feeds Spell Out but not the rules of semantic interpretation. The operation that produces this parse is something referred to as "PF movement."

Such an approach claims that a spoken copy will either be completely interpreted or completed ignored by the semantics. What we find instead, in cases of pied-piping, are that parts of a spoken copy can be ignored while other parts can be interpreted. For instance, we need to allow the sentence in (24) to have the representation (24b).

(24) a. The girls$_1$ asked into which of each other$_1$'s stories the boys$_2$ looked.

b.

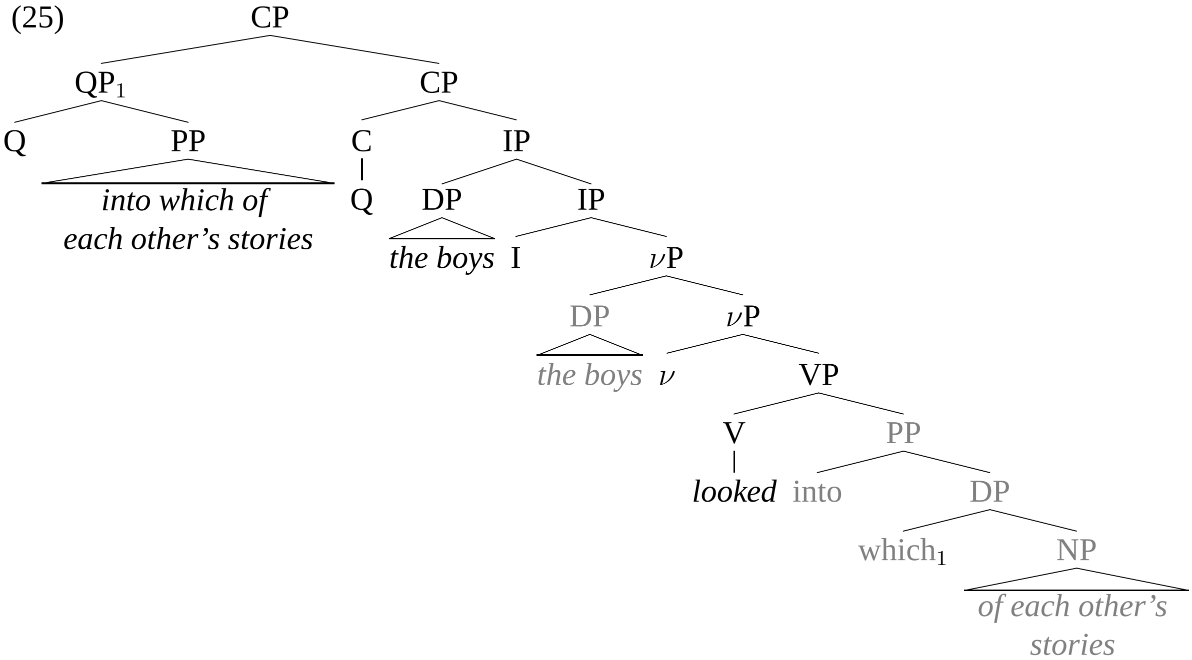


In (24a), *each other*, and so the NP containing it, must be interpreted in its spoken position. The locality condition on binding reciprocals will not allow it to be interpreted in just its unspoken position, as is indicated by the ungrammaticality of **The girls$_1$ asked that the boys$_2$ look into each other's$_1$ stories*.[13] On the other hand, the preposition can only be interpreted in its unspoken position. Our system would not be able to interpret (25), for instance.

[12] See Sauerland & Elbourne (2002), for instance.

[13] On the copy theory of movement, the locality condition on anaphors must be able to be satisfied by way of any of the copies of that anaphor. This too, I think, speaks on behalf of a multidominance view of copies.

(25)



Because only determiners are interpreted as variables, the variable in the lower copy is *which*$_1$, and this is associated with *each other's stories*. But the binder in (25) is the PP *into which of each other's stories*. As a consequence, the semantics that we've developed in section one would give (25) something like the interpretation sketched in (26) (the details will depend on how the semantics of wh-determiners are fleshed out).

(26) [into which of each other's stories] $\lambda x.$ [the boys looked into $[\![$the$]\!]$(λy.each-other's-stories(y) $\cap$ $\lambda y.y = x$)]

The variable in the object position of *into* ranges over things that are 'each other's stories' and 'into each other's stories,' and that is quite wrong. The problem with (25), then, is that the lower copy of the PP cannot be interpreted as a variable and this makes the PP in Specifier of CP wrongly bind the DP.[14]

In pied-piping constructions like (24), then, it appears that parts of the moved phrase are interpreted in different positions. PF Movement cannot do that. We need something other than the normal mechanisms behind movement to explain (23).

I suggest that these instances of semantically vacuous "movement" are instead cases where the normal principles of linearizing a phrase marker are overrun by requirements of Spell Out. I'll sketch now a way to do that.

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[14]Perhaps we should extend the theory reviewed in the first section so that things other than determiners can be interpreted as variables. Perhaps, for instance, we could generalize Fox's Trace Conversion rule so that it interprets some, presumably silent, term that selects PPs, and other moveable phrases, as a restricted variable in the way that this rule presently does just determiners. This would at least provide a way of allowing the silent PP in (25) to be interpreted as a variable and take us a step closer to understanding how to interpret it. (There would still be problems to overcome, however. We would have to find a way of ensuring that both copies of *each other's stories* picked out the same individuals, for instance.) While this direction may provide a solution, its invocation of silent variable-determiners wherever they seem to be needed seems to me *ad hoc*.

The Spell Out requirements that are relevant for the cases we've been examining are (27).[15]

(27) a. A C^0 with a [Q] feature must be right adjacent to the string whose [Q] feature it values.
b. An I^0 with a [+case] feature must be right adjacent to the string whose [+case] feature it values.[16]

These are intended merely to code the fact that the Specifiers of CP and IP have the phrases in them that C^0 and I^0 AGREE with. One can think of (27) as being a version of the "strong" agreement feature that a question C^0 or finite I^0 have, or, to use different terminology, the "EPP" feature that these heads have. Understand these to be well-formedness conditions on Spell Outs.

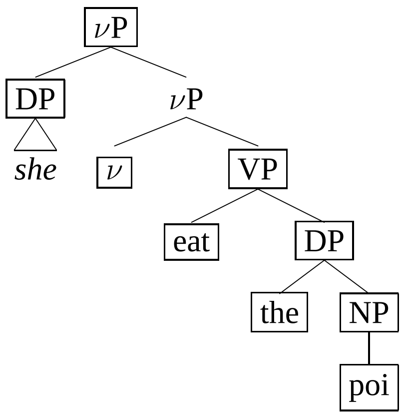
For the "normal" linearization of a phrase marker, I'll adopt Kayne (1994)'s Linear Correspondence Axiom, a slightly modified version of which is in (28).

(28) LINEAR CORRESPONDENCE AXIOM (LCA)

- If γ asymmetrically c-commands ρ, then $\lfloor\gamma, \rho\rfloor$.
- LCA($\lfloor A, B\rfloor$) = $\{ \langle\alpha, \beta\,\rangle : \alpha$ is dominated by A and β is dominated by B $\}$.
- $\langle x, y\rangle =_{\text{def.}} x$ precedes y.
- LIN(P) = LCA($\lfloor A, B\rfloor$) for all A and B in P that are maximal or minimal projections.

The LCA produces a set of ordered pairs whose transitive closure is a string which includes all of the terminals in some phrase marker. It translates "asymmetric c-command" into precedence. It will apply to the simple νP in (29), for example, to produce the ordering in (31). (I've boxed the maximal and minimal projections that enter into an asymmetric c-command relation.)

(29)



(30) asymmetric c-commanders in (29):

$$\left\{\begin{array}{l} \lfloor \text{DP}_{\text{she}}, \nu\rfloor, \lfloor \text{DP}_{\text{she}}, \text{VP}\rfloor, \lfloor \text{DP}_{\text{she}}, \text{eat}\rfloor, \lfloor \text{DP}_{\text{she}}, \text{the}\rfloor, \lfloor \text{DP}_{\text{she}}, \text{NP}\rfloor, \lfloor \text{DP}_{\text{she}}, \text{poi}\rfloor \\ \lfloor \nu, \text{eat}\rfloor, \lfloor \nu, \text{DP}_{\text{the}}\rfloor, \lfloor \nu, \text{NP}\rfloor, \lfloor \nu, \text{the}\rfloor, \lfloor \nu, \text{poi}\rfloor \\ \lfloor \text{eat}, \text{the}\rfloor, \lfloor \text{eat}, \text{NP}\rfloor, \lfloor \text{eat}, \text{poi}\rfloor \\ \lfloor \text{the}, \text{poi}\rfloor \end{array}\right\}$$

[15]I ignore here those conditions relevant for forcing head movement.

[16]This is a better description of French than it is of English, as English lets adverbs intervene between the surface position of the subject and where we think I^0 is. The right account will make sense of this language variation. What matters here is only that the EPP, which this is an attempt to express, is a Spell Out condition.

(31) LIN(νP):

$$\left\{\begin{array}{llll} \langle\text{she}, \nu\rangle & \langle\text{she, eat}\rangle & \langle\text{eat, the}\rangle & \langle\text{the, poi}\rangle \\ (\nu, \text{eat}) & \langle\text{she, the}\rangle & \langle\text{eat, poi}\rangle & \\ \langle\nu, \text{the}\rangle & \langle\text{she, poi}\rangle & & \\ \langle\nu, \text{poi}\rangle & & & \end{array}\right\}$$

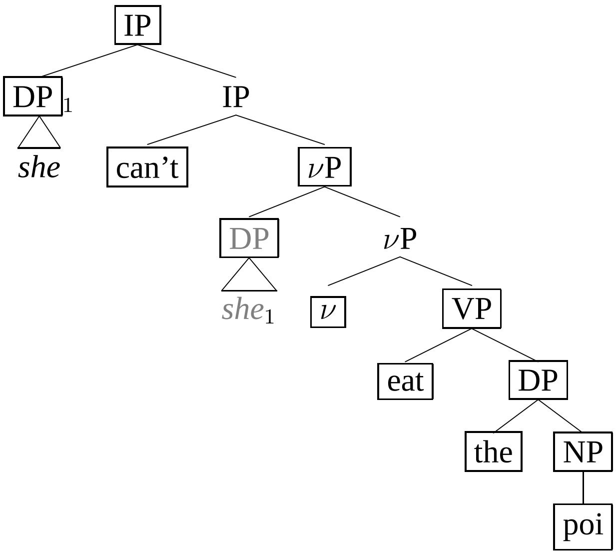
The string (31) corresponds to is *she* ν *eat the poi*, as desired.

When copies are involved, things get more complex. If we assume that copies can neither precede nor follow each other (=(32)),[17] then the LCA cannot be both complete and consistent in a phrase marker that has copies.[18]

(32) $*\langle x, y\rangle$, where x and y are copies.

For example, consider how the LCA would evaluate the full sentence that (29) fits into:

(33)



Because DP_{she} asymmetrically c-commands she_1, a complete linearization of this phrase marker will include ⟨she, she⟩, a violation of (32). Let's understand linearizations, then, to be as complete as possible. For any given phrase marker, let the LCA produce a set of linearizations that are as complete as (32) will allow them to be.

(34) Form all subsets, α, of the set generated by the LCA such that:

a. α makes a consistent linearization (e.g., obeys (32)) , and

b. α orders a copy of every terminal.

We can let the well-formedness conditions on Spell Out choose from these linearizations the correct one. So, for instance, the two consistent, complete linearizations of (33) are (35).

[17]This is easiest to derive on the view that copies are one phrase with several syntactic positions.
[18]See Nunes (1995).

(35) a.
$$\left\{ \begin{array}{lllll} \langle \text{she, can't} \rangle & \langle \text{she}, \nu \rangle & \langle \text{she, eat} \rangle & \langle \text{eat, the} \rangle & \langle \text{the, poi} \rangle \\ \langle \text{can't}, \nu \rangle & \langle \nu, \text{eat} \rangle & \langle \text{she, the} \rangle & \langle \text{eat, poi} \rangle & \\ \langle \text{can't, eat} \rangle & \langle \nu, \text{the} \rangle & \langle \text{she, poi} \rangle & & \\ \langle \text{can't, the} \rangle & \langle \nu, \text{poi} \rangle & & & \\ \langle \text{can't, poi} \rangle & & & & \end{array} \right\}$$

= *she can't* ν *eat the poi*

b.
$$\left\{ \begin{array}{lllll} \langle \text{can't, she} \rangle & \langle \text{she}, \nu \rangle & \langle \text{she, eat} \rangle & \langle \text{eat, the} \rangle & \langle \text{the, poi} \rangle \\ \langle \text{can't}, \nu \rangle & \langle \nu, \text{eat} \rangle & \langle \text{she, the} \rangle & \langle \text{eat, poi} \rangle & \\ \langle \text{can't, eat} \rangle & \langle \nu, \text{the} \rangle & \langle \text{she, poi} \rangle & & \\ \langle \text{can't, the} \rangle & \langle \nu, \text{poi} \rangle & & & \\ \langle \text{can't, poi} \rangle & & & & \end{array} \right\}$$

= *can't she* ν *eat the poi*

Only (35a) meets the Spell Out requirement in (27b), however, and so it's chosen.

This, then, is the normal linearization procedure. For the cases of semantically vacuous movement that we're interested in, I suggest there is a rule that adds linearization statements.

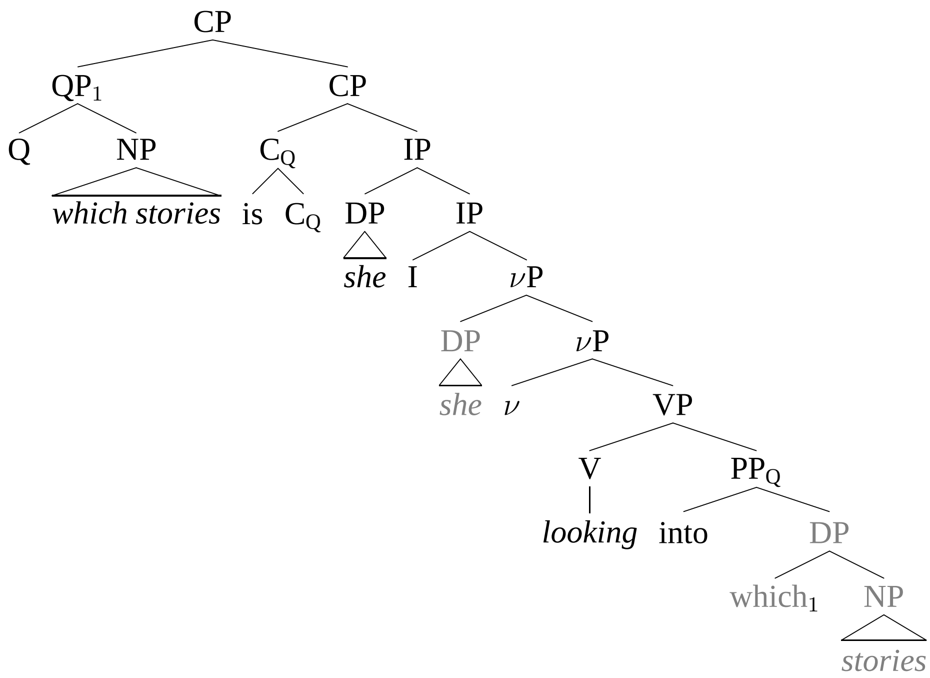
(36) move $=_{\text{def.}}$ add $\langle \alpha, \beta \rangle$, α, β terminals.

This rule will have the effect of giving positions to terminals that do not reflect their hierarchical position. It will create the illusion that these terminals have moved. Cases of semantically vacuous movement, then, will be situations where the semantics requires a syntactic representation that cannot be reconciled with its Spell Out requirements. In such cases, (36) will add linearization statements in order to produce a string that satisfies the Spell Out requirements. In this way, Spell Out requirements can force an unfaithful linearization of a syntactic representation required by the semantics.

Let's look at how this will work for a simplified version of (24).

(37) a. Into which stories is she looking?

b.



Let (37b) be the representation that is semantically interpreted. It correctly places the determiner *which*, interpreted as a restricted variable, in the scope of its binder (*Q which stories*), and puts *into* in a position that allows it to combine in the normal way with its selecting verb. Because the Q feature is on the PP, *into which stories*, the Spell Out requirements will be satisfied only if this PP immediately precedes C^0. This is not how (37b) would be normally linearized, however, and so (36) will be invoked to create the string in (37a).

An LCA-faithful linearization of (37b) is (38).

(38) {
⟨which, stories⟩ ⟨stories, is⟩ ⟨is, she⟩ ⟨she, looking⟩ ⟨looking, into⟩
⟨which, is⟩ ⟨stories, she⟩ ⟨is, looking⟩ ⟨she, into⟩
⟨which, she⟩ ⟨stories, looking⟩ ⟨is, into⟩
⟨which, looking⟩ ⟨stories, into⟩
⟨which, into⟩
}

= *which stories is she looking into*

This is formed by taking the subset of the ordered pairs that the LCA produces for (37) that omits the shaded terminals. This is a perfectly accurate linearization of (37b), but, as noted, it does not satisfy the Spell Out requirement on question complementizers in (27a), repeated here.

(27a) A C^0 with a [Q] feature must be right adjacent to the string whose [Q] feature it values.

In (37), the [Q] feature which C^0 values is on the PP headed by *into*. What (27a) requires, then, is that the C^0 be right adjacent to the string in (39).

(39) {
⟨into, which⟩ ⟨which, stories⟩
⟨into, stories⟩
}

= *into which stories*

To satisfy (27a), the statements ⟨into, which⟩ and ⟨into, allegations⟩ need to be added to the linearization in (38). Adding those statements and leaving everything else in (38) will result in an inconsistent linearization. For instance, it will create a linearization that contains (40).

(40) { ⟨into, which⟩, ⟨which, into⟩ }

Indeed, there is no subset of (38)+⟨into, which⟩+⟨into, allegations⟩ that orders all copies of the terminals and is consistent. Movement, then, must do more than add the statements that provide satisfaction of (27a). It must add statements that do this and achieve a complete linearization. Movement will need to add the statements in (41).

(41) Add: { ⟨into, which⟩ ⟨into, stories⟩ ⟨into, is⟩ ⟨into, she⟩ ⟨into, looking⟩ }

Adding (41) to (38), and then taking a subset which orders all the terminals, is consistent and satisfies the Spell Out requirement in (27a) gives us:

(42)

⟨which, stories⟩	⟨stories, is⟩	⟨is, she⟩	⟨she, looking⟩	⟨into, looking⟩
⟨which, is⟩	⟨stories, she⟩	⟨is, looking⟩	⟨into, she⟩	
⟨which, she⟩	⟨stories, looking⟩	⟨into, is⟩		
⟨which, looking⟩	⟨into, stories⟩			
⟨into, which⟩				

= *into which stories is she looking*

This is just the string that we are trying to achieve.

4. Conclusion

Semantically vacuous movement is "Add ⟨α, β⟩." We are not free to add linearization statements at will, however, as Earliness (=(16)) insists that we produce a Spell Out that is as faithful to the syntactic representation as possible. Thus, we should expect to find semantically vacuous movement only in those situations where there are Spell Out requirements at odds with the semantics.

What's left to understand is why the movement produced by "Add ⟨α, β⟩" obeys all of the constraints — islands, constituency, etc. — obeyed by producing copies.

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