Syntax 5: Working Toward an Identity Condition of Verb Phrase Ellipsis

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I. Introduction

Our aim in this paper is to work toward establishing the identity condition for verb phrase ellipsis (VPE) with staunch resolution.

II. Establishing common ground

VPE is a type of surface anaphora that we know to be licensed by a head (T, Σ, auxiliaries, be0[1]), that elides the entire complement of the licensing head, and that the process hinges on the fulfillment of an identity condition. The aspect of VPE that is at issue in this assignment, is what the shape of that identity condition ought to be. Specifically, the identity condition must be formulated in a way that accounts for syntactic identity:

1. Harvey hurt himself and I did _ too.

For semantic identity:

2. A: Did Harvey see you? B: Yes, he did _ .

For ambiguity:

3. Bill washed his car, and Harvey did _ too.

In an effort to account for all of these issues, we have created a working definition of the identity condition that will serve as a starting point for our discussion of VPE, and which can be modified as we continue to discover more about this ellipsis process.

Our working definition of the identity condition that is necessary for VPE to take place is given below.

Identity Condition (IC): In order for VPE to take place, there must be strict semantic identity between the antecedent and the complement of the licensing head. By strict identity, we are referring to identity of compositionally-derived lambda expressions, the building blocks of semantic representation (SR).[2]

While this definition is fairly straightforward, there are a few implicit assumptions being made that ought to be discussed. We are assuming that semantics are part of our model from the very beginning. Since we are using computational semantics, the meaning gets build along with the syntactic tree. This lends itself to a structure in which each node of the derivation is associated with a particular lambda expression. Under the IC, the lambda expression of the elided material must be identical to that of its antecedent. In addition to this, we are assuming that the model is not the Y-model, as it is not clear exactly where (or if) semantics are integrated.

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[1] In addition to which, possessives are a potential licensing head, as are 'little v's for those who find active/passive mismatches to be acceptable.

[2] While we are sticking to this definition of the IC throughout the paper, it is worth noting that the level of semantic instruction that the various authors have received varies quite a bit, and as a result, the ways in which semantic representation is shown may differ slightly (although not in any theoretically significant ways) throughout.

In order for this definition of the IC to work, semantics must be incorporated into the deep structure, so notions such as identity and indices are available to the syntax. That being said, while the Y-model does not work for our purposes (at least in its present form), there are a number of idea encoded in it that we do not wish to abandon. Specifically, we want to maintain our understanding of deep structure and surface structure, as well as a number of morphological notions such as spell-out and vocabulary insertion rules. We will not adopt any particular model in this paper, as any model that encodes the ideas above would allow for the IC to function as stated.

Now that we have defined the IC for VPE, we will consider the way in which it is able to account for the issues that were mentioned previously. Specifically, the fact that VPE seems to be able to take place under syntactic identity and semantic identity, and can lead to either ambiguous sentences. While this seems contradictory in some ways, we will soon see that the IC, as stated, does indeed manage to account for all of these issues.

First, we will consider the issue of sentences like 1 and 2, in which one appears to have syntactic identity while the other appears to have semantic identity.

1. Harvey hurt himself and I did _ too.
2. A: Did Harvey see you? B: Yes, he did _ .

In sentence 1, the antecedent and the gap are syntactically identical in that they both [hurt *x*self], in which *x* refers to the subject their respective clauses. While this fact has previously led some to think that there ought to be a way to formulate an identity condition for VPE using only strict syntactic identity. However, this is unnecessary, as we are able to account for the issue by using the IC as stated above. In this particular instance, both of the VPs in question, the elided VP and its antecedent, will have the lambda expression ($\lambda x.\text{hurt}'(x,x)$) associated with the VP node. This is the only requirement that needs to be met under the IC, which would therefore allow VPE to take place. With this analysis we incur no problems with the reference of the reflexive pronoun, as the subject that is added to the lambda expression at the TP will differ in each clause. Once the subject *Harvey* is introduced in the antecedent clause, and *I* am introduced in the second clause, the resulting lambda expressions that are associated with each node will differ, one being ($\lambda x.\text{hurt}'(x,x)$)(Harvey) and the other being ($\lambda x.\text{hurt}'(x,x)$)(I). This illustrates that our IC is able to account for what appears to be syntactic identity. In considering sentence 2, there seems to semantic identity, as both of the VPs in question involve the seeing of the same entity (*you* and *me*, respectively). However, there is a difference in the syntactic properties of these two VPs, as one is specified for second person and the other is specified for first person. Regardless, the IC we have created will account for this just as well as it did with sentence 1, as both the antecedent and the elided VPs have the same lambda expression associated with the node. Namely, $\lambda x.\text{see}'(x,y) [y->:)]$, in which y refers to the model referent ":)". Since identity of the lambda expressions is met, our IC would allow VPE to take place. In short, the IC as stated can account for both types of sentences, ones that appear to have syntactic identity and ones that appear to have semantic identity, because instead, they both have identity of the lambda expressions associated with the antecedent and elided material.

Second, we will consider the issue of ambiguity raised in sentence 3.

3. Bill washed his car, and Harvey did _ too.

The ambiguity of this sentence results from the fact that there are three possible readings:

a. Harvey washed his [Harvey's] car, and I did [washed Harvey's car] too.

b. Harvey washed his [Harvey's] car, and I did [washed my car] too.

c. Harvey washed his [Joe's] car, and I did [washed Joe's car] too.

This is accounted for by the way in which indecies are used in the deep structure. In reading 3a, both of the pronouns are indexed with Harvey. In sentence 3b, both of the pronouns are indexed with the subject of their own clause. And in sentence 3c, both of the pronouns are indexed with some (same) entity that is specified as third person, masculine, and singular, that is not otherwise represented in the syntax. We are adopting a theory in which these indecies are sprinkled into the syntax at deep structure, and they are constrained by the binding theory, which will prevent illicit combinations of indecies from arising, as the derivation will crash and burn if the binding theory is not adhered to. In addition to this, we must mention that since indecies do not require reference to be fixed at this particular point, the issue of reference will not bear on our definition of the IC. Consequently, our IC, as stated, is able to account for the fact that sentences with VPE can be ambiguous.

We have now seen that the IC we are working with is able to account for the majority of the stumbling blocks that we have encountered in the past in formulating a functioning identity condition for VPE.

III. Looking at the data

Now that we have a working definition of the IC, we must see whether or not it can account for types of sentences containing VPE that we have yet to consider. The purpose of this section is to determine if the IC as it now stands is capable of accounting for all of the facts concerning VPE, or if careful consideration of more sentences will lead to observations that bear on the issue of the IC to the point that it ought to be tweaked slightly or drastically changed.

A. Sentences 1 & 2

Considering each of the sentences carefully, one can see that there are a few ambiguities in the first couple of examples, in which there are two possible readings. For example, (1a) has an ambiguity between 'John who likes planes that can fly' and 'John who is a pilot and enjoys flying the planes around in the sky.' It should be noted that there cannot be a mismatch between the two conjuncts; in fact they must have the same reading in order for VPE to occur. More specifically, they must have the same compositionally derived lambda expressions, which are the basic building blocks of semantic representation. In any case, here are some trees showing the structural ambiguity in example (1).

(1)
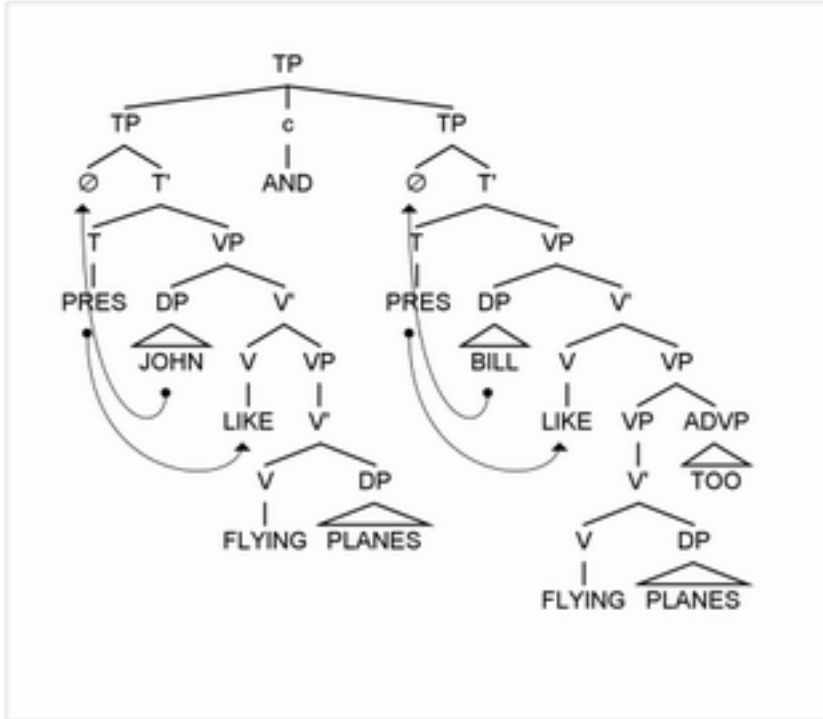
(1.5)
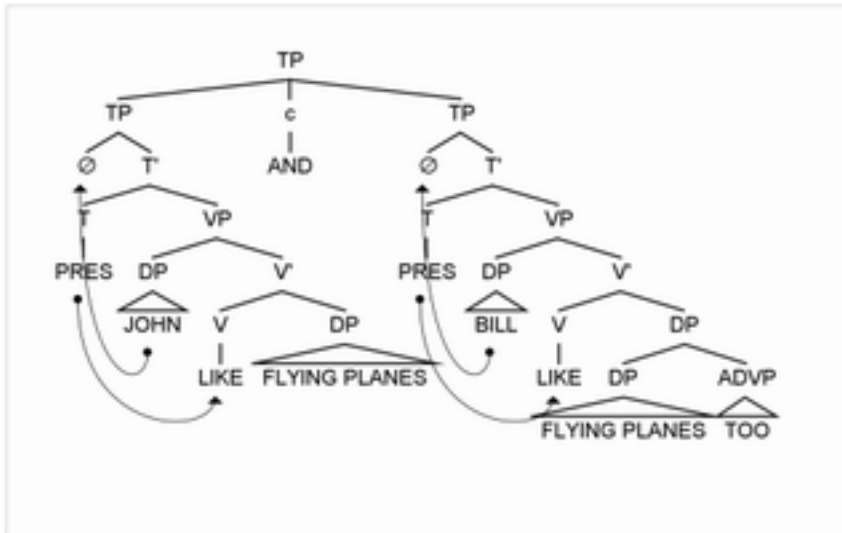
These two conjuncts must match in order for VPE to occur and since they do match, VPE can occur. This is true for (1b) and (1c), in which they must match in their lambda expressions as well. However, the examples in (2) show no ambiguity, which may be surprising, at least for example (2b). Moreover, example (2a) is a passive structure, but more importantly, both conjuncts must have identical lambda expressions for VPE to occur. There may be a possible ambiguity in example (2a), in which the sentence could be read as "Betsy seems to me to be unhappy and Sandy isn't happy too. However, this seems like a forced reading and it wouldn't be a natural occurrence. So, the 'do' in the second conjunct is a leftover T in the matrix clause that has spelled out as "does;" the 'do' is not a spell-out of the lower clause "to be unhappy."

Thus, it seems that when VPE occurs with raising verbs, the elision must be from the matrix clause and not the lower clause, and that both conjuncts must still have the same lambda expressions.

B. Sentences 3 & 4

      To begin, we will carefully consider the sentences given below.

(3) a. *The steak is ready to eat, and the chicken is ready to too.
  b. *Peter is easy to talk to, and Betsy is easy to too.
  c. *Peter is ready to give up, and Betsy is ready to too.

(4) a. The steak is ready to eat, and the chicken is too.
  b. Peter is easy to talk to, and Betsy is too.
  c. Peter is ready to give up, and Betsy is too.

In these examples, there are a few things going on. Let's attempt an analysis! Why are the sentences in (3) bad and the ones in (4) so obviously good?

      We can rule out some notions: 'to', for instance, is not implicated in this badness. We've seen it do plenty of licensing, as for instance below.

1337. Yusuf: Is Jill going to go to the store?
      Alfonse: Well, I know that she wants to _.

      We also might want to say that there is something about the structure, or implicate a causative-inchoative mismatch, but this doesn't account for the examples in ({3,4}{a,b}) very well. Ostensibly, there is no chance for the structure to vary across conjuncts.

      The main issue appears to be that tough-movement is bringing arguments out of the VPs; without the tough-type predicates, the issue disappears.

1338. Sam was supposed to bring me a pie, and Freddie was supposed to _, too.
1339. I don't know if Jill will want to join the class, or if Kelsey will want to _, either.

      Finally, we can see that this isn't an issue when there is a dummy (non-referring) pronoun in subject position:

1340. It is ready to rain, but not to pour.

      Hence, we can deduce that the issue is one of argument mismatch in the elided VPs.

      What we know, then, is that the way that tough-type predicates raise arguments out of VPs must have an impact on the semantic representation of those VPs, likely one involving a relationship, and furthermore that this mismatch is rectified by the time our bottom-up semantic composition has reached the upper VP (or vP), since 'is' appears to be a legitimate licensing site; hence, the identity conditions must be met at the complement of 'is'. What we - and probably others - don't precisely understand is how tough-type movement differs from other types of A-movement (or, indeed, from A'-movement), in terms of the operation itself or where it occurs within a derivation. This handicap aside, I'll attempt to throw a dart at the issue.

Something that we *do* know about tough movement is that it can do a number of things. Objects, both direct and indirect, can be moved up into upstairs subject positions (this comes paired with downstairs subject pro-drop), and in cases of filled upstairs subjects, we also see evidence of subject control. We do not necessarily assume that these are the same species of operation, though I'm going to act as though they are until evidence crops up to the contrary.

That said, there doesn't seem to be an alternation in grammaticality judgments based on which interpretation these sentences take; whether we are reading them as steaks and babies ready to do some eating or be eaten, the badness remains.

Another possible explanation for those who deny traces and copy-theoretical notions is that tough movement occurs sometime after ellipsis, and thus the attempts to extract from an ellipsis site (or equi into it) could be explained as 'bad'. However, we've already seen apparent wh-extraction from ellipsis sites, and oddities like the missing antecedent phenomenon of H&S (67, 84) make the ordering of these things somewhat muddier. Besides, who wants to live in a world without traces, anyway?

Where this leaves us is a claim that, because of the type of operations that tough-movement applies, identity does not exist at the 'to' level, as in (3), but that it does at the copula level, as seen in (4). Note that, if we assume tough-movement to obliterate arguments, we end up with

1341. \x.\y.eat'(x,y)

for the lower VP (for the transitive meaning). The arguments to 'eat' are not bound until the arguments of 'ready' come into play. If we assume that the DS subject of 'ready' started in its specifier, then this would explain why the complement of 'is' might be a more complete semantic unit, but not why identity isn't met. Similarly, if we assume that tough-movement *leaves* traces, then we can see why the VPs might be different at the 'to' level (\x.eat'(x,steak) vs \x.eat'(x,chicken)), but not necessarily why this would be remedied by the time our composition reaches the 'is' level.

C. Sentences 5 & 6 & 9

These sentences are all examples of bound pronouns, as opposed to strict model-interpreted reference. As such, they are potentially susceptible to quantifier scoping (and therefore quantifier binding) issues. As such, our current theory of VPE conditions explains the data fairly well.

5. Someone admires everyone, and Bill does, too.
There is only one reading here, and my rusty lambda calculus scribbles the SR of these VPs somewhat thusly:
1415. (\x: Ay: admire'(x,y)) ∧ (\x: Ay: admire'(x,y))

These are identical except for the argument that gets passed in for x when the bottom-to-top composition reaches the subject[3] so the complexity of 'someone' doesn't interfere with the SR of the VP; hence, it is conditioned.

(6)a   Betsy greeted everyone when Sandy did.
  b   greeted everyone.
  c   greeted him/her/them.

The two readings here are actually reflecting two different underlying SRs:
Ignore the semantics of 'when' for now; a naive simplification to implication will (hopefully) suffice for our purposes here.

1416. $(Ax.person'(x) (greet'(s,x)->greet'(b,x)))$

Here, x is bound by the universal. For each person, a greeting from Sandy implies a greeting from Betsy.

1417. $[Ax: greet'(s,x) \wedge person'(x)](greet'(b,x))$

And in this example, the other reading is reflected. The key thing to note here is that the internal VPs would have to be identical in both situations to meet the IC. The two VPs' readings would look something like, \x.Ay.greet'(x,y) and \x.\y.greet'(x,y).

(9)   I read everything you did.

This is likely just a part of how restrictive relative clauses work.

1418. $[Ax: read'(you,x)](read'(me,x))$

We can see that the universal scopes over both VPs, despite appearances to the contrary in our phonetic (orthographical?) form. At any rate, the single reading reflects the binding of that variable in SR, and that's pretty much that.

D. Sentence 7

(7) A: What was Harry taking a picture of?
  B: A gnu.
  A: *What was Tom?

Sentence (7), or rather, the series of sentences of which (7) is comprised, presents some kind of restriction on the identity condition of VPE. From just these sentences, one might propose several possibilities that explain the restriction found here--all of which should then be tested by looking at other sentences.

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[3] Watch us completely ignore VPISR and any traces it might have left. Since we don't actually know if subject raising is A-movement, or indeed if A-movement is really a thing anymore, I'll content myself with the non-explanation that obviously VPISR, being special, leaves no traces, and, obviously, it must precede ellipsis in a derivation.

One explanation that comes to mind is the interaction of VPE and T to C movement. Given that VPE is a head-licensed phenomenon, the elided VP must be deleted by its sister, which in most cases is T. If we take (7) to be evidence of an interaction between these two phenomena, then it can be reasoned that VPE must precede T to C movement, because T must licence the ellipsis. It then follows that WH words cannot undergo WH movement because they have been elided. However, by looking at other sentences, it becomes clear that this is not the issue:

(401) I know which books Tyrion has read, but which (ones) hasn't he?
(402) Tyrion listed all the books he read but we still don't know which (ones) he hasn't.

Here we see VPE with WH movement from out of ellipsis site. For reasons unknown, the presence of "ones" improves the acceptability of the sentence for some, though not all have any issue with the sentence in the first place. In (401), not only is there VPE and WH movement, but there is also T to C. While we have assumed that VPE must follow T to C in order for the ellipsis to be licensed, it is also frequently assumed that WH movement follows T to C. However, in order for the WH word to escape the ellipsis site, it must have left before the elision. These facts create a sticky situation, though it does not seem they bear directly on the identity condition of VP. In fact, among these facts was established evidence that the problem with (7) was not WH movement out of a VPE site within a question, because we have a grammatical sentence with all those elements.

Another possible explanation is that the VPE site is within the second sentence, which has undergone stripping and thus the antecedent has been deleted. Therefore, we should attempt the third sentence without an intervening stripped sentence:

(403) *If John already ate all the food, what will everyone else?
(404) A: Susie hasn't eaten any vegetables today. B: *What has she?

This hypothesis fails. Even without the intervening stripped sentence which might have served as an explanation for the ungrammaticality of (7), sentences such as the third in the (7) series are bad. There don't seem to be any explanations for the ungrammaticality of these sentences beyond the possibilities considered thus far. It has occurred to me, however, that perhaps sentences (401) and (402) meet some conditions that the other sentences do not, and thus appear as exceptions to an otherwise strong restriction on WH moving out of a VPE site. When put into a situation similar to that of (7), however, ungrammaticality is found:

(405) A: Which books has Tyrion read?
   B: The novels and the biographies.
        A: *Which ones hasn't he?

If we ignore sentences (401) and (402), which may require further analysis, we can make the claim that WH movement out of ellipsis sites is disallowed. This may even be extended to all A-bar movement, and then explained by an ordering of A-bar movement and ellipsis processes. Regardless of how one views VPE, explaining the inability of WH words to escape an ellipsis site is a simple matter of saying that such content is inaccessible. In some theories, that may be because the content was entirely deleted, where in others, it may merely be silent and thus having it appear in its full phonetic form is disallowed. Because WH words are required to raise, and VPE is incompatible with their raising, an identity condition can be put in place to prevent such situations from occurring. Thus, the identity condition will state that the VPE target cannot be the VP of a clause that is +WH.

E. Sentence 8

1. *What Betty saw was Topkaki, and what Peter did _ was South Pacific.
2. *What Betsy saw was Topkaki, and Peter did _ too.
3. *What Betsy saw was Topkaki, and what Peter did too.
4. *What Betsy saw was Topkaki, and what Peter saw too.
5. What Betsy saw was Topkaki, and what Peter saw was South Pacific.

In the ungrammatical examples (1) through (4) we see an ellipsis site in a coordinated Wh-cleft structure. We can compare these with example (5) which contains no ellipsis and is indeed grammatical. First, let us look at the structure of (1).
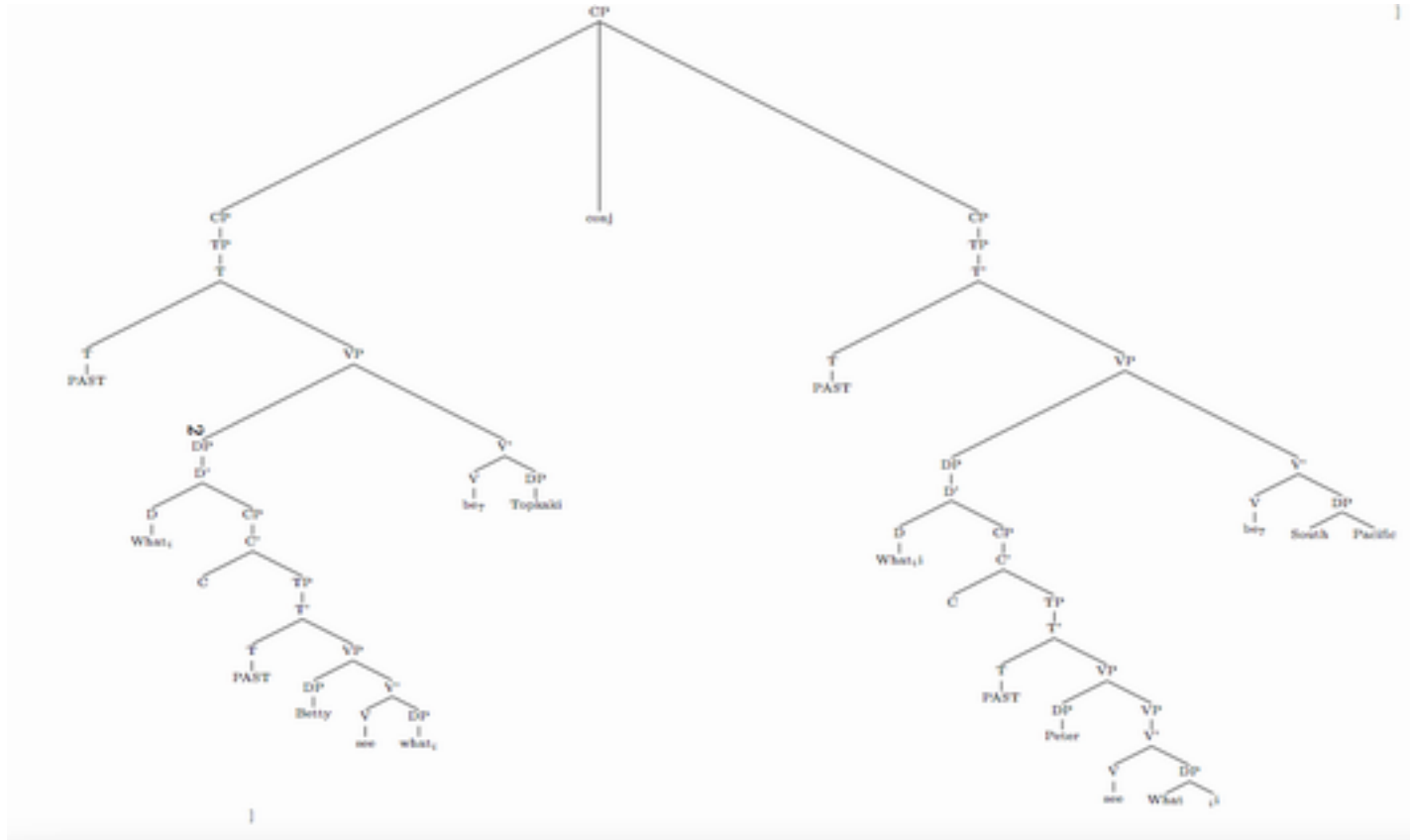
In our current theory of VPE, an entire VP is missing. In example (1), the argument of the elided V, *South Pacific,* is still present in surface structure, thus the entire VP was never elided. Further, the two complements of be7 are not identical, which can be a further indication that in order for VPE to occur there must be identity between arguments. Because, these arguments are not identical, neither were elided. However, the recurring be7 was elided and replaced with do, causing the ungrammaticality of (1).

When we look at example (2), the entire VP was elided, however the phrase is still deemed ungrammatical. In (1), the elision site attempts to refer to material in the cleft, while in example (2), the elided material refers to the material within the cleft as well as the focus. It seems that the elided material in the coordinated phrase cannot refer to elements within the Wh-cleft. Example (3) and (4) further support this claim. Both (3) and (4) contain Wh-clefts in both clauses, the elided material cannot refer to material within the focus of the first clause. I believe this is due to the Wh-clefts forming a free relative, which blocks identity with outside information. The following examples agree:

6. *What Betsy ate was chicken, and Peter did _ too.
7. *What Betsy ate was chicken, and what Peter did _ too.
8. What Betsy ate was chicken, and what Peter ate was pork.

9. (?) What Betsy ate was chicken, and what Peter ate was too.

Our current theory of VPE would allow the generation of the ungrammatical sentences displayed above. We can account for these ungrammaticalities by stating that in coordinated wh-cleft sentences, elided material cannot refer to information within the free relative. Example (9) has various grammaticality judgements, with most readers finding it better than (6) and (7). This is due to the elided material referring to the scope of the preceding clause, and not the free relative, but then again, (9) is not VPE.

G. Sentence 10

(10)a   Betsy wants Peter to read everything that Alan wants him to read.
   b   does.
   c: Sandy does too.
   d: *Sandy wants him to too.

   We can get two highly distinct readings from 10b: in the first, Betsy wants Peter to read everything that Alan reads; in the second, Betsy wants Peter to read everything Alan wants him to read. The elided content in the relative clause can be in identity either with the logical representation of the whole VP "wants" or just the VP "reads." For the first reading, we might expect there to be identity between the two underlined parts below. The higher underline corresponds to the elision site, and the lower underline corresponds to the elision antecedent.

b1)   [λx wants'(x)([λy read'(y)[λz∀x` want'(z)(read'(y,x`))]](Alan)](Peter))](Betsy)

   _____

b2)   [λx wants'(x)([λy read'(y)[λz∀x` read'(z,x`)]](Alan)](Peter))](Betsy)

   _____

   This is a syntactician's rendition of lambda calculus. What is important for our purposes are the parallelisms between the elision clause and the antecedent clause. In b1, the structure of "want," "read," and the object being read is identical. The subject of the reading event is y in both, and object that is ultimately being read in both is x`. The subject of the wanting event is outside the scope of each clause. In b2, the subject of the reading event is outside the scope of each clause. Within each clause is the object of the reading - x`. Because the logical representations are identical, VPE is licensed in either form.

   10c is a straightforward example of VPE at the highest clause. We need not give a representation for it here. However, there is something of interest in 10c. Consider the following possible combinations of (a), (b), and (c):

11

c1)   "Betsy wants Peter to read everything that Alan wants him to read, and Sandy does too."

c2)   "Betsy wants Peter to read everything that Alan does, and Sandy does too."

Let's consider different possible meanings for the above. (c1) only has one meaning: both Sandy and Betsy want Peter to read everything that Alan wants him to read. (c2) is ambiguous, however. It can mean: Betsy and Sandy want Peter to read everything that Alan reads. It can also mean: Betsy and Sandy want Peter to read everything that Alan wants Peter to read. In these examples, it therefore appears that VPE in the second elision clause mirrors the same behavior as that in the VPE in the relative clause. This would pose a problem if the logical structure of an elision wasn't preserved after VPE. If so, the necessary x` information corresponding to the object of the reading event would be lost for one of the VPE transformations. However, because VPE affects the syntactic structure of the phrase but not the logical structure of the phrase, we do not have this problem. It is perfectly fine for the logical structure of VPE elision to be in identity with the logical structure containing another VPE elision.

Finally, we have (10d):[4]

d1) *Betsy wants Peter to read everything that Alan wants him to read, and Sandy wants him to too.

d2) *Betsy wants Peter to read everything that Alan does, and Sandy wants him to too.

First, we ought to mention that these are generated by our current grammar. Consider the syntactician-lambda calculus representations below:

d1) and'([λx wants'(x)([λy read'(y)[λz∀x` want'(z)(read'(y,x`))]](Alan)](Peter))](Betsy),

λx wants'(x)([λy read'(y)[λz∀x` want'(z)(read'(y,x`))]](Alan)](Peter))](Sandy))

d2) and'([λx wants'(x)([λy read'(y)[λz∀x` (read'(z,x`))]](Alan)](Peter))](Betsy),

λx wants'(x)([λy read'(y)[λz∀x` (read'(z,x`))]](Alan)](Peter))](Sandy))

As we will see in example 11, it appears that sometimes the predicate selecting a clause in which there is an elision can influence the grammaticality of the elision. We will propose that in order for elisions within a the scope of a "want"-type predicate to be successfully elided, they must contain the "want" predicate within the elision.

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[4] It ought to be acknowledged that several students have agreed that these are not necessarily ungrammatical constructions for them.

H. Sentence 11

We can also evaluate the conditions of VPE from the perspective of example 11 as well. In this sample, we see two things at play: first, we see that the size of the elision site in a two-clause sentence may affect the possible interpretations of pronouns in the gap, and second, we see that VPE in a lower clause may affect the possibility of the sentence being interpreted in accordance with a "sensible" or "stupid," reading.[5]

(11) a) Sam claimed he was taller than he was
b)   and Bill did too.
c)   and Bill claimed he was too.

There are two dimensions of ambiguity that exist for these example sentences. The first form of ambiguity derives from the possible referents of the pronouns. Because "he" in these sentences can refer to "Sam," "Bill," or any third-person male human (we'll use "Bob" as a stand-in), we will not dwell on every possible interpretation for 11 (a-c). Several interesting facts about possible referential properties of the pronouns may strike us as relevant to determining the condition on VPE, however.

Notice that it is quite easy to get a sloppy or strict reading from 11b:

11b)   1) "Sam claimed [Sam] was taller than [Sam] was, and Bill did [claim [Sam] was taller than   [Sam] was] too." (strict)
        2) "Sam claimed [Sam] was taller than [Sam] was, and Bill did [claim [Bill] was taller than [Bill] was] too." (sloppy)

Since both of these readings are possible, our grammar ought to generate both. Since the semantics differs between the two readings, VPE is present in the sentence regardless of its reading, and semantic identity is required between clauses for VPE to occur, our grammar must be able to generate semantically different logical representations that correspond to both readings such that VPE is licensed in each. This is possible depending on the logical representation we use for the VPs in the above sentence. The following are represented with an assumed "sensible" interpretation.

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[5] The terms "stupid" and "sensible" are being borrowed from Hankamer and Sag (1976) 419-420. A "stupid" reading of a comparative is one in which a contradiction is made. For "Sam claimed he was taller than he is," if both "he"s correspond to "Sam," one can read this sentence "stupidly" as saying Sam claimed his height was greater than itself. In a "sensible" reading, Sam is claiming that his height is greater than it happens to be in reality. Sam may be bluffing or may be ignorant of his own height.

1)   and([λx claim'(x)((taller-than'(Sam)(height-of'(Sam)))](Sam), [λx claim'(x)((taller-than'(Sam)(height-of'(Sam)))](Bill))

2)   and([λx claim'(x)((taller-than'(x)(height-of'(x)))](Sam), [λx claim'(x)((taller-than'(x)(height-of'(x)))](Bill))

The above are a syntactician's rendition of what logical representations might look like for (11b) 1 and (11b) 2. Although their internal workings are very complex and don't really concern us, what's important for us to take out of them is the general method of representation for strict/sloppy ambiguity within the sentence. In (11b) 1, "Sam" is a constant used directly in the logical representation so as to indicate that the VP-internal references must be in identity between the elision clause and the VPE antecedent clause in order for a strict reading to emerge. In order to get a sloppy reading, you replace the constants "Sam" with a bound variable. Because "Bill" is the external argument in the elision clause of 2, the x variables are interpreted as "Bill," and it is therefore Bill who claims that he is taller than his height. (By "height," we mean something like "objective height," given this is the sensible reading of the sentence.) By replacing the constants with bound variables, a reflexive reading is adopted in each clause in (11b) 2, and a sloppy reading is the result. Also note that each variable in the elision material is directly bound by a λ-operator also present in the elision. If we take Sag and Hankamer's assumption that all variables have to be bound by a λ-operator within the elision site seriously, the fact that this sentence meets such criteria for sloppy readings ought to help convince us we are making more or less the right kind of logical representations at the VP level (Sag & Hankamer 1984, 331). Although we arrive at different readings, notice that both remind us of valid logical representations of their original sentence, and the VP in each representation is completely equivalent across clause boundaries. Because of this latter condition, VPE is licensed given the conditions of VPE articulated earlier: strict semantic identity between the antecedent and the complement of the licensing head.

Meanwhile, both strict and sloppy readings are not possible for sentences like 11c.

11c)   "Sam claimed he was taller than he was, and Bill claimed he was ___ too."
        #"Sam claimed [Sam] was taller than [Sam] was, and Bill claimed [Bill] was [taller than [Bill]   was] too."[6]

The reason we do not get the above interpretation is because within the logical form of such sentence, there are variables that are not bound by an λ-operator:

_____

[6] I only get this reading if "he" is stressed in the elision clause: "Sam claimed he was taller than he was, and Bill claimed HE was too." (And I think it's necessarily a stupid reading, am I wrong?)

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11c) (sloppy)   and([λx claim'(x)(<u>(taller-than'(x)(height-of'(x))</u>)](Sam), [λx claim'(x)(<u>(taller-than'(x)(height-of'(x))</u>)](Bill))

      Notice that in this logical representation, the underlined unit is now a much smaller constituent - the lower clause VP. If we follow Sag and Hanakamer's assumption that for a sloppy reading to arise in a sentence, the variables must be bound by a λ-operator, we can can rule out a sloppy reading based on the VPE constituency indicated by the underlined portions of the above logical representation. Here, neither the variables in the antecedent clause nor those in the elision clause are defined by a λ-operator within the lower-clause VP.

      We can also explain why a strict reading is present in (11c).

      11c) "Sam claimed [Sam] was taller than [Sam] was, and Bill claimed [Sam] was [taller than   [Sam] was] too." (strict)

      Here is its logical interpretation based on 11b:

1) (strict)   and([λx claim'(x)(<u>(taller-than'(Sam)(height-of'(Sam))</u>)](Sam), [λx claim'(x)(<u>(taller-than'(Sam)(height-of'(Sam))</u>)](Bill))

      For the strict reading, the lower-clause VPs have no variables, but contain only the constant "Sam." Since there are no rules restricting the use of constants in a VPE elision, nor on the antecedent of a VPE elision, our grammar has no trouble generating this reading of (11c).

      It should be clear from this that example 11 presents us with an example of how the syntactic size of VP ellipsis, whether it operates over two clauses or just one, can result in difference within the logical representation, thereby affecting how the interpretations of the sentence.

      11 also exemplifies another kind of ambiguity: stupid vs. sensible readings. For sentence (11a), "Sam claimed he was taller than he was," a stupid reading is one in which the sentence means that Sam claimed his height to be larger than itself; it's a reading that interprets a contradiction out of the comparative. Sam's height can't be greater than Sam's height, because they are necessarily equal. If Sam was 5 feet tall, we would not want to say that 5 feet tall is taller than 5 feet tall. A sensible reading is one in which Sam is erroneously claiming that his height is larger than it actually is in the real world. Thus, if we were in a context in which Sam was guessing his own height, (11a) might be uttered to mean that Sam overestimated his own height; the height Sam claims to have is larger than the height he has in reality. No logical contradiction exists in this reading.

(11a) can be interpreted in a stupid or sensible way regardless of whether "he" refers to Sam or a third person entity ("Bob").

11a)
2) "Sam claimed [Sam] was taller than [Sam] was." (stupid or smart)
3) "Sam claimed [Bob] was taller than [Bob] was." (stupid or smart)

Since both are valid readings, we should develop a convention in our logical notation to account for each. Let's adopt the following convention:

2) (sensible)   λx claim'(x)((taller-than'(x)(height-of(x)))](Sam)
2) (stupid)   λx claim'(x)((taller-than'(x)(x))](Sam)

In the above representations, the sensible reading corresponds to the logical representation we used earlier. It is read: There's a person (Sam) who claims he is taller than his actual, real-world height. For the stupid reading, the representation reads: There is a person (Sam) who is taller than himself.

Our main finding with respect to stupid and sensible readings is that in sentences like (11b), wherein VPE operates over the claim made by X, both stupid and sensible readings can be recovered. When VPE only operates on the lower-clause VP, however, only the stupid reading can be recovered. Let's consider this in more detail.

In sentences like (11b), both stupid and sloppy readings exist.

11b)
4) "Sam claimed [Sam] was taller than [Sam] was, and Bill did [claim [Sam] was taller than [Sam] was] too." (stupid or smart)
5) "Sam claimed [Bob] was taller than [Bob] was, and Bill did [claim [Bob] was taller than [Bob] was] too." (stupid or smart)
6) ?"Sam claimed [Bill] was taller than [Bill] was, and Bill did [claim [Bill] was taller than [Bill] was] too." (stupid or smart)
7) "Sam claimed [Sam] was taller than [Sam] was, and Bill did [claim [Bill] was taller than [Bill] was] too." (stupid or smart)

Let's consider a strict interpretation like (4), and how it would be analyzed from a stupid and sensible perspective. We choose a strict reading because we want to compare these to (11c), and (11c) readings are necessarily strict.

4) (sensible)   and([λx claim'(x)((taller-than'(Sam)(height-of(Sam)))](Sam), [λx claim'(x) ((taller-than'(Sam)(height-of(Sam)))](Bill))

4) (stupid)   and([λx claim'(x)((taller-than'(Sam)(Sam))](Sam), [λx claim'(x)((taller-than'(Sam)(Sam))](Bill))

Let's weigh this against a sensible and stupid reading for (11c), which only allows for stupid readings.

8) "Sam claimed [Sam] was taller than [Sam] was, and Bill claimed [Sam] was [taller than [Sam] was] too." (stupid only)

8) (sensible)   and([λx claim'(x)((taller-than'(Sam)(height-of'(Sam)))](Sam), [λx claim'(x) ((taller-than'(Sam)(height-of'(Sam)))](Bill))

8) (stupid)   and([λx claim'(x)((taller-than'(Sam)(Sam))](Sam), [λx claim'(x)((taller-than'(Sam)(Sam))](Bill))

As it stands, all of the logical representations given above are generated. If we want our representations to rule out the sensible reading of (8) without compromising the strict-only reading of (11c) in general, our area of attack must be on "height-of'(Sam)." If this function took a variable as an argument, we would dismantle the sensible reading of (8), since the representation would then contain a variable not defined by a lambda function within the elision, but it would do so at the cost of compromising the strict-only reading of (11c), since this reading depends on there being constants only in the logical representation of the lower-clause VP.

Intuitively, what is at issue with the sensible reading of (8) has less to do with the kind of input "height-of'(x)" takes, and more to do with its belonging to the input of a comparative that is itself the input of "claims'(x)." This is because

9) "Sam is taller than he is."

can only be interpreted stupidly. It's only when this clause is within the scope of a higher predicate like "claims," "is sure," or "believes" that the sensible reading is possible.

Perhaps what we need on that account is a restriction on "height-of'(x)," or rather the appeal to the way things are in objective reality (or at least the reality assented to by the speaker). This would not include all appeals to objective reality, but only those that are implicitly active in the comparative form: "Blake thinks he knows more than he does [in reality]," "Betsy believes she spends less than she does [in reality]," "Tom pretends to be nicer than he is," etc. This is part of a much greater semantic question concerned with where these interpretations are licensed in general. For our purposes, we only need to draw a parallel between these and the

necessity of stupidity for (8). Therefore, we will posit the following restriction on comparative VPE ellipsis:

A "*predicate*-of(x)" function is only licensed in an elision if the elision contains a predicate of the "claim'(x)" variety that scopes over the comparative of "*predicate*-of(x)."

This essentially means to say that a kind of predicate that is an argument of a comparative function and makes an appeal to the way things are in the objective world can't exist in an elision unless the "claim"-category verb is also within that elision.

It should be acknowledged that this does not alter our conditions on VPE, but specifies a particular semantic requirement for some readings. In general, we would like to say that eliding "taller than Sam was too," from (8) under a sensible reading is bad for a similar reason a sensible reading of "Bill is taller than he is." Technically, this is a new restriction on VPE, but there is no evidence as of now that it is part of a larger class of restrictions that demonstrate necessity for a VP elision to adhere to new general identity conditions.

I. Sentences 12 & 13

12. John scratched his arm, and Bill did too.

VPE requires exact semantic identity. One would expect there to be different meanings for this sentence based on how indices are sprinkled at deep structure; however, only one meaning is possible. Even though one might expect A or C to be grammatical, only D is.

A. *$John_1$ scratched his_1 arm, and $Bill_2$ did [scratch his_1 arm] too
B. *$John_1$ scratched his_2 arm, and $Bill_2$ did [scratch his_2 arm] too
C. *$John_1$ scratched his_x arm, and $Bill_2$ did [scratch his_x arm] too
D. $John_1$ scratched his_1 arm, and $Bill_2$ did [scratch his_2 arm] too

'His' should be able to refer to other people, as in (A, B, C), but due to the strangeness of scratching other people's arms, only D is possible. In D, the 'his' in both conjuncts is xself. You know for sure this is xself because you can replace 'his' with 'his own' and get the same reading. It is useful to compare this to (400).

400. John washed his car, and Bill did too.
A. $John_1$ washed his_1 car, and $Bill_2$ did [wash his_1 car] too.
B. *$John_1$ washed his_2 car, and $Bill_2$ did [wash his_2 car] too.
C. $John_1$ washed his_x car, and $Bill_2$ did [wash his_x car] too.
D. $John_1$ washed his_1 car, and $Bill_2$ did [wash his_2 car] too.

In (400), the pns can both refer to John. They can both refer to some other male, as in C, but it's important that it's the same referent in both conjuncts. In D, both pns are xself. In B, both pns cannot refer to Bill but that's due to a general constraint on reference with a pn that appears before a name:

401. *He$_1$ saw Bill$_1$.
402. *His$_1$ mom saw Bill$_1$.
403. *He$_1$ thinks that Bill$_1$ will go to the park.
404. *He$_1$ ate a great sandwich on Monday. Bill$_1$ saw a movie on Tuesday.

Of course, (400B) is possible with previous linguistic context for 'Bill'. If, previously, someone says "Is Bill's car still super dirty?", then someone else can respond with B. Therefore, it seems we have the following information: normally pns can be free variables, as in (400 A,C), but it can also be a bound variable, xself, as in (12D) and (400D). The reason why you don't get the free variable reading in (12) is because of the semantic restrictions of scratching, i.e. that it's strange to be scratching anybody's arm but your own.

It's truly fascinating how the pn in the elision site has to have the same referent as the pn in the antecedent. Based on this fact, one might want the identity condition to also require exact reference in both the antecedent and anaphor. But this is a fool's path. Consider (405):

405. Mary shot the first deer that entered the clearing, and Bob did too.

There are two possible interpretations for this sentence. In A, both Mary and Bob shot the same deer. In B, Mary and Bob, at two different times, shot two different deer, each of which entered the clearing before other deer.

A. Mary$_1$ shot [the first deer that entered the clearing]$_3$ and Bob$_2$ did [shot [the first deer that entered the clearing]$_3$]too.
B. Mary$_1$ shot [the first deer that entered the clearing]$_3$ and Bob$_2$ did [shot [the first deer that entered the clearing]$_4$] too.

So, how does one unite these competing data? In (400), the pns have to refer to the same people unless the pn is xself. In (405B), the two DPs can refer to different deer. In fact, this doesn't seem to be a property of VPE at all, but, rather, a property of pns themselves. Notice (406-408):

(406) a. He$_1$ thought he$_1$ bought the tickets.
       b. *He$_1$ thought he$_2$ bought the tickets.
(407) a. He$_1$ went to Subway on Friday. He$_1$ went to Quiznos on Saturday.
       b. *He$_1$ went to Subway on Friday. He$_2$ went to Quiznos on Saturday.

(408)   a. Speaker A: He$_1$ loves the beach.
           Speaker B: He$_1$ plays volleyball every Sunday.
       b. Speaker A: He$_1$ loves the beach.
           Speaker B: *He$_2$ plays volleyball every Sunday.

In (406-408), the referent for 'he' cannot change without adding something extra. If while saying the second 'he', you point to a different male or add stress, then you can get the reading where the referents are different. Without this extra information, the only possible readings are the (a) readings. For VPE, you don't say the second pn, so you can't point or add stress to disambiguate the pn. Therefore, the identity condition for VPE shouldn't require the referents to be the same. That is a property of how pns work.

13.   a. Alan said Betsy hit him, and Peter did too.

There are many possible interpretations of this sentence. There are two sources of ambiguity, one from where VPE is happening and one from where the indices are being sprinkled. The indices ambiguity is typical of pns in general and was explained in greater detail about example (12). The other source of ambiguity is interesting though. VPE can either be elliding the VP 'say Betsy hit him' or 'hit him'. In (13a. B), it looks like the CP being coordinated is the embedded one rather than the matrix CP because that second conjunct still, semantically, seems to be another thing said by Alan. In (13a. A, B), the pns refer to Alan and it's grammatical as expected.

        A. Alan$_1$ said Betsy$_2$ hit him$_1$, and Peter$_3$ did [say Betsy$_2$ hit him$_1$] too.
        B. Alan$_1$ said Betsy$_2$ hit him$_1$, and Peter$_3$ did [hit him$_1$] too.

In (C, D) the sentences are ungrammatical because the general constraint on the reference of a pn that appears before the name it refers to. If you provide the proper context, something like asking "How's Peter doing?" for the question under discussion, you can respond with C. If that's the question under discussion, you can't respond with D, because the pn in the first conjunct would be free, but the pn would be a bound variable, xself, in the second conjunct.

        C. *Alan$_1$ said Betsy$_2$ hit him$_3$, and Peter$_3$ did [say Betsy$_2$ hit him$_3$] too.
        D. *Alan$_1$ said Betsy$_2$ hit him$_3$, and Peter$_3$ did [hit him$_3$] too.

The final possibility is that 'him' refers to some other male in the context and is the same referent in both conjuncts.

        E. Alan$_1$ said Betsy$_2$ hit himx, and Peter$_3$ did [say Betsy$_2$ hit him$_x$] too.
        F. Alan$_1$ said Betsy$_2$ hit him$_x$, and Peter$_3$ did [hit him$_x$] too.

b. Alan said Betsy hit him, and Peter said she did too.

In this (b) example, there are two pronouns and thus four possible interpretations. In (13b. A,B), the 'she' keeps refering to Betsy and the 'him' either refers to 'Alan' or some third party.

A. Alan$_1$ said Betsy$_2$ hit him$_1$, and Peter$_3$ said she$_2$ did [hit him$_1$] too.
B. Alan$_1$ said Betsy$_2$ hit him$_x$, and Peter$_3$ said she$_2$ did [hit him$_x$] too.

In (13b. C,D), 'she' refers to some other female, and 'he' refers to either 'Alan' or some other male.

C. Alan$_1$ said Betsy$_2$ hit him$_1$, and Peter$_3$ said she$_x$ did [hit him] too.
D. Alan$_1$ said Betsy$_2$ hit him$_x$, and Peter$_3$ said she$_x$ did [hit him] too.

Because VPE requires exact semantic identity and doesn't refer to reference, this four-way distinction is exactly as expected.

IV. Wrapping up

In conclusion, we have shown that our identity condition is able to account for a number of sentences without difficulty. However, there are a number of issues that we have left unresolved. Specifically, it is unclear where VPE takes place in the syntax. As VPE is a process that is concerned with arguments, that is not sensitive to islands, and that occurs before T-to-C movement, it seems as though it is a good candidate for an "A-movement" operation. If that is the case, then we need to concern ourselves with some more questions. What needs to be said about the ellipsis process, does it leave structure unpronounced or does it delete the structure all together? In other words, will the later syntactic processes that take place have access to any structure within the ellipsis site? When does quantifier binding take place? When is reference fixed? And perhaps most crucially, how does VPISR fit into this view of VPE? In short, it is clear that while we have come far in determining what needs to be said in the identity condition for VPE, we still have a long way to go.