

When we do that and when we don't: a contrastive analysis of VP ellipsis and VP anaphora*

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Abstract. We compare the properties of VP anaphora with the properties of VP ellipsis. We focus on facts showing that VP ellipsis admits a kind of analysis that VP anaphora does not. We argue that a “semantic copying” analysis is the right one for the cases of VP anaphora we consider, while a “PF deletion” approach is correct for (most cases of) VP ellipsis.

1. Introduction

VP ellipsis, exemplified by sentence (1), has been extensively studied since the seminal work of Sag (1976) and Williams (1977)¹. A central question about VP ellipsis concerns the status of the VP category that seems to be missing in sentences like (1). One might group the existing proposals into three families: (i) the “PF deletion” approach; (ii) the “LF copying” approach; (iii) the “semantic copying” approach.

- (1) If you order a pizza then I will ~~order a pizza~~ too

According to the PF deletion approach, a full-fledged VP like *order a pizza* is generated in the normal way in the “elided VP position” but goes unpronounced at PF. According to this approach, at every stage of the syntactic derivation the “missing VP” is actually present, so its presence should be detected. According to the LF copying approach, an unpronounced element with no internal structure (one could view it as a silent proform) is generated in the “elided VP position” and is replaced at the syntactic level LF by more structured syntactic material like *order a pizza*. According to this approach, the “missing VP” is present in the late stage of the syntactic derivation, so its presence should be detected at this stage but not in the earlier steps. Finally, according to the semantic copying approach, an unpronounced element with no internal structure is generated in the “elided VP position” and is simply interpreted in the semantic component as having the same meaning that a

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¹ In this paper, we will sometimes strike through a VP to indicate that the sentence is interpreted as though it had a VP with the relevant meaning, but is pronounced as though it had no VP at all. This is a notational device and has no theoretical significance.

constituent like *order a pizza* happens to have. This means that in no step of the syntactic derivation is the “missing VP” present.

Given that the goal in uttering a sentence like (1) is to communicate a full proposition, it is reasonable to assume that VP ellipsis occurs only when the missing material is in some sense recoverable. However, Hankamer and Sag (1976) have argued, using an independent diagnostic for what material is recoverable, that there are also further conditions on what the missing material in a VP ellipsis sentence can be: the “missing VP” must have the meaning of a VP that is identical or nearly so to a VP in the immediate context. The different approaches could see these further conditions in different ways. The PF deletion approach could say that a condition on PF deletion of a VP is that the VP must be (near-) identical to another VP in the immediate context. The LF copying approach could say that there is a comparable condition on what VPs can be copied at LF. The semantic copying approach could say that there is a comparable condition on how the unpronounced element can be interpreted.

It is fair to say that, notwithstanding the substantial knowledge that has been accumulated on VP ellipsis in more than two decades of research, the choice among these three approaches is still open, at least to a certain extent. Our goal in this paper is to contribute to this debate. However, our approach will be oblique. Instead of addressing VP ellipsis directly, we will focus on a related, but distinct, construction, namely VP anaphora, which is exemplified in (2). The relevant interpretation of (2) is the one on which I order a pizza too.

(2) If you order a pizza then I will do that (too)

VP anaphora has played a role in the discussion of VP ellipsis. In particular, Hankamer and Sag used it in their argument that conditions on the meanings of “missing VPs” go beyond the recoverability condition. For Hankamer and Sag, the set of recoverable meanings was the set of possible meanings for a VP anaphor, and they showed that more meanings are available for VP anaphors like *do that* in (2) than for “missing VPs” like the one in (1). But VP anaphora has not received the kind of attention that VP ellipsis has, and this probably reflects the view that determining the meaning of a VP anaphor is entirely a matter of pragmatics.² We will show in this paper (following Cecchetto 2004) that one can be more precise about what meanings are available for VP anaphors, and more specifically that syntax constrains the available meanings. We will then show that, by comparing the properties of VP anaphora with the properties of VP ellipsis, we can draw conclusions about both constructions. Building on a discussion in Fiengo and May (1994), we will focus on the fact that not all VP ellipsis sentences have VP anaphora counterparts, and that not all meanings for VP ellipsis sentences are available for VP anaphora counterparts. These differences will clearly show that VP ellipsis admits a kind of analysis that VP anaphora does not.

² Hoji (2003) is an important exception. Our approach is very similar to Hoji’s, and this paper complements his in many ways. Unfortunately, we learned of Hoji’s paper only as our paper was nearing completion.

This paper is organized as follows. In section 2, we establish a strong similarity between VP anaphora and VP ellipsis: in the absence of a clear extralinguistic source for VP anaphora resolution, VP anaphors must have the meaning of another VP present at LF. (Our appendix reviews this claim and modifies it slightly.) In section 3, we discuss cases in which VP ellipsis is more liberal than VP anaphora and conclude that they argue against a semantic copying analysis for VP ellipsis and support this analysis for VP anaphora. In section 4, we compare the PF deletion and the LF copying approaches for VP ellipsis and we (tentatively) adopt the former. In section 5, we focus on cases in which VP ellipsis is *less* liberal than VP anaphora and note a consequence for the identity condition that holds between the antecedent and the missing VP. Section 6 briefly explores why VP ellipsis is not allowed in Italian. Section 7 concludes the paper, mentioning another lesson that can be learned from considering VP anaphora and VP ellipsis side by side.

2. VP anaphora is syntactically constrained

VP anaphors can get resolved in a variety of ways. Take for instance the sentence in (2). On the one hand, the meaning of the VP anaphor can be identified with a salient action in the discourse context, one that does not relate to anything that has been explicitly said. For example, suppose Mary utters (2) (without “too”) in a context in which John has dropped all of his papers on the restaurant floor and is trying to pick them up while the waiter is patiently waiting for his order. It would be natural to take (2) to mean “If you order a pizza, then I will pick up your stuff.” On the other hand, the meaning of the VP anaphor can be identified with the meaning of another VP. For instance, we can take the VP anaphor in (2) to “mean the same thing” as the VP in the antecedent clause – on this reading, we would understand (2) as “If you order a pizza, then I will order a pizza.”

One might wonder whether there is a unified explanation for how we resolve VP anaphors. Maybe, one might think, the second case can be reduced to the first somehow. Maybe the fact that we understand the VP anaphor as “order a pizza” is due to the fact that the utterance of the sentence induces us to think about the action of ordering a pizza, in the same way that John’s picking up his stuff induces us to think about the action of picking up John’s stuff.³ As we will mention below, we think that this approach is on the wrong track. But be that as it may, there are some facts that any theory of VP anaphora resolution will have to explain. Cecchetto (2004) has argued that any attempt to explain VP anaphora resolution that does not take the syntax of the sentence itself into account is doomed to failure. Cecchetto argues that, in cases where there is no clear extralinguistic source for VP anaphora resolution, VP anaphors must have the meaning of another VP present at LF.

Cecchetto’s argument is modeled after an argument in the ellipsis literature (Hornstein 1995). Cecchetto starts with examples like (3a) – his actual example is the less awkward Italian (3b) -- and notices that these sentences

³ See Heim and Kratzer 1998, pp. 239-241, for relevant discussion.

naturally admit certain readings. (3a) can be read as saying that, for every x such that x imagined I would declare x to be present, I declared x to be present. (This is the reading that the sentence *I declared to be present everyone who imagined I would declare him to be present* has, if *him* is understood as “bound within the relative clause.”) (3b) can be read as saying that, for every boy x such that x asked me to observe x dancing the tango, I observed x dancing the tango. (This is the reading that the sentence *I observed dancing the tango every boy who had asked me to observe him dancing the tango* has, if *him* is understood as “bound within the relative clause.”) Note that the relative clause here is being “filled in” in such a way that it describes a property that any individual x has if x imagined that I would declare x to be present, or if x asked me to observe x dancing the tango.⁴ Cecchetto then considers examples like those in (4), where the ECM clause has been replaced by a finite clause. He notices that these examples are *not* naturally read as saying that I declared that everyone who imagined I would *declare him to be present* was present, or that I observed that every boy who had asked me to *observe him dancing the tango* was dancing the tango. This, on the surface, is surprising. After all, the material that would be “filled in” on these impossible readings seems like just the material that would be “filled in” on the possible readings of (3). The relative clause is understood in exactly the same way.⁵

- (3) a. I declared everyone who imagined I would do that to be present
 b. *Ho osservato attentamente ogni ragazzo che mi aveva chiesto di farlo danzare il tango*
 ‘(I) have observed carefully every boy who had asked me to do it dancing the tango’
- (4) a. # I declared that everyone who imagined I would do that was present
 b. # *Ho osservato attentamente che ogni ragazzo che mi aveva chiesto di farlo danzava il tango*
 ‘(I) have observed carefully that every boy who had asked me to do it was dancing the tango’

⁴ The judgment about the availability of the relevant reading does not change if the subject of the ECM structure is postverbal. In (i) the intended interpretation is as natural as in (3a), and in (ii) it is as natural as in (3b). ((ii) feels slightly better than (3b), probably because heavy subjects like to be postverbal in Italian.)

(i) I declared to be present everyone who imagined I would do that

(ii) *Ho osservato attentamente danzare il tango ogni ragazzo che mi aveva chiesto di farlo*

‘(I) have observed carefully dancing the tango every boy who had asked me to do it’

⁵ Note that, when we described the readings of the sentences in (3), we chose paraphrases in which the quantifier has scope over the matrix verb. By contrast, here we have described readings on which the quantifier takes scope *within* its clause. It is *not* surprising that the examples in (4) lack the very same readings that we mentioned for (3): it is well known that a quantifier subject of a finite clause has difficulty taking scope outside the clause. But it *is* on the surface surprising that they don’t have readings of the kind we described where the quantifier takes scope within its clause.

Why does (4) lack these readings? Because, says Cecchetto, there is no VP in the sentence which, if substituted for the VP anaphor, would yield the readings in question. The readings of (3) arise from an LF in which the quantifier has undergone QR, leaving behind a VP with just the meaning that the VP anaphor would have to have in order to obtain these paraphrases. The idea here (look at the LFs in (3')) is that the trace of the quantifier is a variable, and that a quantifier of the form *everyone who imagined I would declare X to be present*, where *X* is a variable, can mean just what is meant by *everyone who imagined I would declare him to be present*. So, when the VP anaphor has the same meaning as the remnant VP, the quantifier as a whole will mean what is meant by *everyone who imagined I would declare him to be present*. But now consider (4). If we want to have a chance of obtaining the “impossible readings” of (4) that we described, we are going to have to leave the quantifier within its clause: our readings are readings on which the matrix verb has scope over the quantifier. But, if the quantifier remains within its clause (see (4')), there will be no VP around with the meaning that the VP anaphor would have to have on the desired reading.

- (3') a. LF: [_{IP} [_{DP} everyone who imagined I would **do that**] [_{IP} I [_{VP} **declared t to be present**]]]
 b. LF: [_{IP} [_{DP} ogni ragazzo che mi aveva chiesto di **farlo**] [_{IP} pro [_{VP} ho **osservato t danzare il tango**]]]
- (4') a. LF: [_{IP} I declared that [_{IP} [_{DP} everyone who imagined I would **do that**] [_{IP} t was present]]]
 b. LF: [_{IP} Ho **osservato attentamente che** [_{IP} [_{DP} ogni ragazzo che mi aveva chiesto di **farlo**] [_{IP} t danzava il tango]]]]

On this explanation, then, what is important in allowing the VP anaphor to mean *declare him to be present* is that we have a constituent like *declare t to be present* elsewhere at LF. In sentences like those in (3), such a constituent is formed when the quantifier QRs to a position above *declare*. In sentences like (4), such a constituent is not present if the quantifier remains low, and this is why the “impossible readings” we described do not arise.⁶ The result, in fact, is that, in the case of a sentence like (4), there will be *no reading possible* on

⁶ This kind of explanation predicts that we also won't allow a reading for (3) in which the VP anaphor is understood in the same way and in which the quantifier remains below *declare*. Assuming that leaving the quantifier below in *I declared every X to be present* would yield a reading on which my declaration was that every X is present, it seems to us that we prefer not to leave the quantifier below to begin with. (In a situation in which my declaration was that every professor was present but in which I declared that John – a professor who I did not know to be a professor -- was absent, O.P. finds it difficult to take *I declared every professor to be present* to be true.) But in any case it is clear to us that the sentence cannot be read as saying that my declaration was that everyone who imagined that I would declare him to be present was present. We won't discuss the relevant evidence here.

which the VP anaphor contributes something like *declare him to be present* -- given that a quantifier subject of a finite clause can never QR to a position outside the clause,⁷ there is no way of producing a constituent with this meaning.

In the discussion that follows, we accept this argument that, in the absence of extrasentential cues to salient actions, VP anaphors have the meaning of another VP present at LF. (We will return to it in the appendix.) Let us pause for two technical points before we enter into the core of our paper.

We have not presented a detailed analysis of (3) and (4). But it is essential to Cecchetto's story that a sentence like (3) admit LFs in which the variable in the trace position is the kind of variable that can be bound within the relative clause, and that it *only* admit such LFs. To be more precise, assuming with Heim and Kratzer (1998) that LFs contain adjoined binder indices (which function as "lambda abstractors"), Cecchetto's account of (3) is based on the assumption that the index at the top of the relative clause is always the same as the index on the trace. (3'') indicates the way semantic composition then works⁸ -- the VP anaphor, whose denotation is the same as that of the remnant VP, "behaves" as though it contained a variable bound by the binder index at the top. (And it might contain a variable like this, if something like the LF copying approach is appropriate for VP anaphors. But it also might not.) If the index at the top of the relative clause were *different* from the index on the trace, as in (5), the VP anaphor would be predicted to "behave" as though it contained a free variable, and on standard assumptions we would predict an impossible⁹ reading for a sentence like (3) -- a reading in which I declared to be present everyone who imagined I would declare *a certain salient person* to be present. This kind of point is familiar from the ellipsis literature (see Kennedy 2004 for a recent summary), where the same issue has come up.

- (3'') a. LF: [_{IP} [_{DP} everyone who [1 [_{IP} *t*₁ imagined I would **do that**]]] [1 [_{IP} I **declared** t₁ **to be present**]]]
- i. [[declare *t*₁ to be present]] = λg. the property of declaring g(1) to be present
 - ii. [[do that]] = the above
 - iii. [[*t*₁ imagined I would do that]] = λg. the proposition that g(1) imagines I declare g(1) to be present
 - iv. [[1 *t*₁ imagined I would do that]] = λg. the property that an individual *x* has as long as *x* imagines I declare *x* to be present
(= [[1 *t*₁ imagined I would declare *t*₁ to be present]])

⁷ A sentence like (4a) thus cannot be read with a "wide scope" reading for the quantifier, no matter what the interpretation of *do that* is taken to be. QR out of finite clauses is commonly held to be impossible. See Cecchetto 2004 for a specific formulation of the clause-boundedness constraint on QR from which it follows that in cases like (4) extraction of the quantifier is impossible.

⁸ We assume here that denotations are functions from assignments. Where Heim and Kratzer would write [[*X*]]^g = α, we would write [[*X*]] = λg. α .

⁹ Impossible in the absence of cues to salient actions, that is.

b. LF: $[_{IP} [_{DP} \textit{ogni ragazzo che } [\underline{1} [_{IP} \mathbf{t}_1 \textit{ mi aveva chiesto di farlo}]] [\mathbf{1} [_{IP} \textit{ pro ho osservato } \underline{t}_1 \textit{ danzare il tango}]]]]]]$

- i. $[[\textit{osservato } \mathbf{t}_1 \textit{ danzare il tango}]] = \lambda g.$ the property of observing $g(1)$ dance the tango
- ii. $[[\textit{farlo}]] =$ the above
- iii. $[[\mathbf{t}_1 \textit{ mi aveva chiesto di farlo}]] = \lambda g.$ the proposition that $g(1)$ asks me to observe $g(1)$ dance the tango
- iv. $[[[\mathbf{1} \textit{ t}_1 \textit{ mi aveva chiesto di farlo}]]] = \lambda g.$ the property that an individual x has as long as x asks me to observe x dance the tango
(= $[[[\mathbf{1} \textit{ t}_1 \textit{ mi aveva chiesto di osservare } \mathbf{t}_1 \textit{ danzare il tango}]]]$)

(5) LF: $[_{IP} [_{DP} \textit{ everyone who } [\underline{1} [_{IP} \mathbf{t}_1 \textit{ imagined I would do that}]]] [\mathbf{2} [_{IP} \textit{ I declared } \underline{t}_2 \textit{ to be present}]]]]$

- i. $[[\textit{declare } \mathbf{t}_1 \textit{ to be present}]] = \lambda g.$ the property of declaring $g(2)$ to be present
- ii. $[[\textit{do that}]] =$ the above
- iii. $[[\mathbf{t}_1 \textit{ imagined I would do that}]] = \lambda g.$ the proposition that $g(1)$ imagines I declare $g(2)$ to be present
- iv. $[[[\mathbf{1} \textit{ t}_1 \textit{ imagined I would do that}]]] = \lambda g.$ the property that an individual x has as long as x imagines I declare $g(2)$ to be present

We can now explain why we are suspicious of the view that VP anaphora resolution always starts from our thinking about a particular action or property. In simple cases like *If you will order a pizza, then I will do that too*, perhaps one can imagine how we would go from the action of ordering a pizza to the denotation of the VP anaphor, which is just (a function from assignments to) the property of performing that action. But in the case of a sentence like (3), the denotation of the VP anaphor is something more complicated whose identity depends on the identity of a particular index -- an index that must be the same as the binder index at the top of the relative clause and the index of the trace of the relative pronoun. Even if we could claim that processing the sentence leads us to think about a property like the property of being declared to be present, getting from there to the denotation we need seems less straightforward.¹⁰ (Incidentally, complex examples like (3) are not needed to make this point. There are many simpler examples where a VP anaphor is resolved in an index-dependent way. The examples we will consider just below are like that.)

¹⁰ This is not a watertight argument, of course. The best way to counter it would be to find an actual case where a VP anaphor can be resolved in an index-dependent way, but where (as in our pizza example earlier) it is impossible to maintain that the resolution is triggered by linguistically present material.

3. When VP ellipsis is possible and VP anaphora is not

Our discussion so far suggests that, typically, when we take a sentence like (6) (or Cecchetto's Italian version in (7)) to mean that I examine every boy who asks me to examine him, this is because in some manner the VP anaphor comes to have the meaning of the VP that QR produces. VP anaphora thus seems to bear an important similarity to VP ellipsis, if common beliefs about VP ellipsis are correct: some process or other can insure that its meaning is the same as the meaning of another VP present at LF.

- (6) a. I examine every boy who asks me to do that
b. $[_{IP} [_{DP} \text{every boy who } t \text{ asks me to do that}] [_{IP} I [_{VP} \text{examine } t]]]$
- (7) a. *Interrogo ogni ragazzo che mi chiede di farlo*
'I examine every boy who asks me to do it'
b. $[_{IP} [_{NP} \text{ogni ragazzo che } t \text{ mi chiede di farlo}] [_{IP} \text{pro} [_{VP} \text{interrogo } t]]]$

In fact, one might see sentences like (6) or our earlier sentence in (3) as a cognate case of "A(ntecedent)-C(ontained) D(eletion)" sentences like (8). Arguments just like our argument in the last section have been given that support the idea that QR is what enables the "missing VP" here to have the meaning it does.

- (8) a. I examine every student John does ~~examine~~ t
b. $[_{IP} [_{\text{every student OP John does}} [_{VP2} \text{examine } t]] [_{IP} I [_{VP} \text{examine } t]]]$

The same questions that are asked about VP ellipsis, then, might reasonably be asked about VP anaphora. What is the process by which a VP anaphor comes to have the meaning of another VP present at LF? In these cases, is *do that* the pronunciation of a more complex VP, following a kind of pronunciation rule that applies only when this VP is identical to another one? Is *do that* replaced at LF by another VP in the same structure? Or is *do that* for some reason just interpreted as having the same meaning that another VP has?¹¹ We will now consider some differences between VP ellipsis and VP anaphora, which suggest that the two kinds of phenomena call for different kinds of analyses.

One difference – which as far as we know has not been noticed before – can be appreciated by looking at sentences like (9). As Hirschbühler (1982) observed, the "ellipsis" clause in sentences like (9) can have the "inverse scope"

¹¹ Similar questions could be posed about other kinds of anaphora. For instance, Elbourne 2001 analyzes e-type pronouns as pronunciations, subject to an identity requirement, of more complex expressions. So similar questions arise there. A reviewer points this out, and sees our paper as "relevant more generally to analyses...that seek to create an underlying ... equivalence between a pro-form and a fully spelled-out syntactic representation."

reading of its pronounced counterpart in (10), a reading compatible with the planes being inspected by different technicians.¹²

- (9) A security agent inspected every plane and a technician did too
- (10) A security agent inspected every plane and a technician inspected every plane too

The same reading, however, is not available for sentences like (11) or the Italian (12), in which the “missing VP” has been replaced by a VP anaphor (note that the Italian sentence *Un addetto alla sicurezza ha controllato ogni aereo*, just like its English counterpart *A security agent inspected every plane*, does allow inverse scope).

- (11) A security agent inspected every plane and a technician did that too
- (12) *Un addetto alla sicurezza ha controllato ogni aereo, e anche un tecnico l'ha fatto.*
'A security agent inspected every plane and a technician did it too'

A second difference – which was noticed by Fiengo and May (1994) – involves ACD sentences like (8). We just discussed our VP anaphor sentences (6) and (7) as cognate cases of ACD, and one might imagine that treatments of ACD in the literature could have considered VP anaphor sentences of this kind, especially given that VP anaphora has a wider distribution cross-linguistically than VP ellipsis. But discussions of ACD have usually been based on English data and have steered clear of VP anaphora. And this is for a good reason. If one tries to reproduce a classical ACD example like (8) by using VP anaphora, the result is sharply ungrammatical. This is indicated by (13a) for English and (13b) for Italian:

- (8) I examine every student John does
- (13) a. *I examine every student (that) John does that
b. **Interrogo ogni ragazzo che Gianni lo fa*
'(I) examine every student that Gianni it does'

What do these differences suggest? To begin with, what is going wrong in these last examples with VP anaphors? Here, we will essentially adopt the diagnosis of Fiengo and May (1994, p. 247). Examples like (6), which we started with, show that the problem is *not* that *do that* can't mean what *examine*

¹² Typically, we understand the “ellipsis” clause in this way when we understand the “antecedent” clause in the same kind of way, as compatible with the planes being inspected by different security agents. Fox (1999) observed moreover that if instead the “ellipsis” clause is understood as saying that a *single* technician did all the inspections, the “antecedent” clause *cannot* have the inverse scope reading. See Fox (1999) for discussion and an explanation.

t means: after all, in (6), *do that* seems to mean just that. Rather, we take it that the problem in (13) is basically syntactic. Even if *do that* were to mean what *examine t* means, we would still need a relative operator¹³ at the edge of (*that*) *John does that* in order to make it into the kind of constituent that can combine with NP. We take the problem to be this: a relative operator needs to be associated with a trace, but *do that* cannot literally contain a trace for the relative operator to be associated with. Note by the way that in sentences like (6), this detail that *do that* cannot contain the trace of a relative operator does not cause problems: there, the trace of the relative operator appears outside *do that*, as the subject of *ask*. But in (13), where there is no place outside *do that* where we could locate a trace of a relative operator, it does cause problems. In general, we will only be able to produce ACD-like examples with VP anaphora when the relative clause is big enough to accommodate the trace of a relative operator.

Simple as it is, this explanation for the ungrammaticality of (13) has consequences for the choice among our three approaches, both as regards VP ellipsis and as regards VP anaphora.

Important to this explanation was that, if a constituent like (*that*) *John VP* is to function as a relative clause, *VP* must contain the trace of a relative operator. If this is the case, however, then in ACD cases like (8), where the parallel constituent *John does VP* functions as a relative clause, it must be the case that the elided VP material contains the trace of a relative operator. This is incompatible with the semantic copying approach to VP ellipsis, which would treat the elided VP as an item with no internal structure. So the facts we considered have consequences for the analysis of VP ellipsis: they force us to reject the semantic copying approach.

At the same time, if *do that* cannot contain the trace of a relative operator, this suggests that a semantic copying approach *is* promising for *do that*: on this view, *do that* (or maybe just *that*) is an unanalyzed expression whose meaning can be identified with the meanings of other LF constituents, including of course constituents that contain variables¹⁴. This approach to *do that*, as it happens, is also well suited to account for the unavailability of the “inverse scope reading” of the *do that* clause in (11)-(12). If we restrict ourselves to situations where the meaning of *do that* is identified with the meaning of another LF constituent, it is clear why we would never arrive at an “inverse scope reading” for the *do that* clause. Assuming that the antecedent clause only has LFs of the kind in (14), no constituent of the antecedent clause has a meaning that would compose with *a technician* to yield the proposition that every plane got inspected by at least one technician. More assumptions are required to derive that *A technician did that can never* mean that every plane got inspected by at least one technician, but (to our minds) nothing particularly outrageous. If *do that* is further constrained as to its semantic type, for example, that would do the trick. Suppose that *do that* is constrained so that it

¹³ Or at least a binder index, if what matters is that we produce the kind of constituent that can semantically modify NP.

¹⁴ In this respect, *do that* seems akin to pronouns on their “paycheck” uses.

can only take a property, i.e. an object of type $\langle e, st \rangle$, as its value (or, more precisely, a function from assignments to properties). No property can combine with the existential quantifier *a technician* to yield the proposition that every plane got inspected by technicians, so if *do that* is constrained to take a property as its value, no LF in which *do that* combines with *a technician* could possibly yield that proposition.^{15, 16} Alternatively, to the extent that the discourse context makes certain values for anaphors “salient,” it might be that we are built in such a way that the discourse context never makes salient to us the kind of value that we would need for *do that* if we wanted to produce the “inverse scope reading” -- a function that takes quantifiers and yields propositions.

- (14) a. [[DP a security agent] [1 [[DP every plane] [2 [t1 inspected t2]]]]]
 b. [[DP every plane] [2 [[DP a security agent] [1 [t1 inspected t2]]]]]

To summarize, we have argued in this section that two differences between VP anaphora and VP ellipsis can be made sense of if a semantic copying approach is correct for the former, but not the latter, construction.¹⁷

¹⁵ If you don’t see this point, try to come up with a property such that, if we find just one technician with that property, that is enough to conclude that every plane got inspected by at least one technician. (Good luck.)

¹⁶ In fact, to treat *do that* properly, we clearly need a more sophisticated analysis. We have frequently been talking about *do that* as describing the performance of an action, and indeed *do that* generally seems to be limited to the kinds of properties that agents have (though there are some apparent exceptions). This could fit with an event-based approach on which VPs describe properties of events: one might say, on this approach, that *do that* is limited to events that involve agents (if “involving an agent” is a coherent notion). More specifically, one might imagine that *that* carries no restrictions on its own, and that it is *do* that imposes requirements on what kind of property of events its sister can be.

¹⁷ A reviewer reminds us of another difference between VP anaphora and VP ellipsis, points out that it is reminiscent of the “inverse scope reading” difference that we discussed, and suggests that it naturally receives the same kind of explanation. Hankamer and Sag (1976) discuss a phenomenon involving “Russell’s ambiguity” in comparatives: (i) is ambiguous between a reading on which Kim’s claim is incorrect (they call it a “sensible” reading) and a reading on which Kim makes a contradictory claim (they call it a “stupid” reading). They observe that while ellipsis as in (iia) preserves the ambiguity, VP anaphora as in (iib) forces the “stupid” reading. Our reviewer notices that, if we arrive at the “sensible” reading of (i) by moving something out of the scope of *claimed* (cf. von Stechow 1984), then it is clear why the VP anaphora clause should lack a “sensible” reading. No constituent of the antecedent clause will have a meaning that could compose with *Pat* to yield the “sensible” proposition.

(i) Kim claimed that Lee was older than he was...

(ii) a. ... and Pat did too. (ambiguous)

b. ... and Pat did that too. (“stupid” reading only)

4. The PF deletion approach to VP ellipsis vs. the LF copying approach.

Having excluded the semantic copying approach for VP ellipsis, we are left with the choice between the PF deletion approach and the LF copying approach. Is there any basis for making this further choice? We suspect that sentences like (15), which involve apparent extraction from an ellipsis site, could be relevant to this issue.¹⁸

(15) I know which person Mary talked to *t* and which person Bill didn't.

The two approaches would treat cases like (15) in different ways. The PF deletion approach can maintain that (15) is just a run-of-the-mill case of extraction from the VP *talk to which person*. The VP from which extraction has taken place, *talk to t*, can then go unpronounced, given that this VP is syntactically and semantically identical to its pronounced counterpart (assuming that the two traces can have the same index). By contrast, for the LF copying approach, overt extraction cannot be involved, since, by assumption, the VP in the second clause does not have any structure at the point when overt extraction would take place. Adopting the LF copying approach thus forces us to assume that *which person* is base-generated in Spec,CP. The trace that *which person* binds then gets supplied in the covert component, after LF copying.

Conceptual considerations might on their own militate against the assumptions that the LF copying approach is forced to here. If there are not so many cases where base-generation is needed, perhaps it is better to have an analysis that doesn't assume it. And adding the possibility of base-generating wh-phrases in Spec,CP potentially introduces redundancies into the theory, if conditions that otherwise seem to regulate movement have to be extended to include the relation between a base-generated wh-phrase and its trace.¹⁹

There may also be empirical reasons for favoring the PF deletion approach. Suppose you think that the only way of interpreting *I know whose mother Mary talked to t* is by reconstructing the pied-piped material, and suppose you believe that material can only reconstruct to a position that it

¹⁸ See Chao 1987, Fiengo and May 1994 and Tancredi 1992 for the observation that it is possible to extract a *wh*-phrase from an ellipsis site.

¹⁹ Of course, if it turned out that conditions on movement do *not* hold between allegedly base-generated wh-phrases and their traces, that would be support for the base-generation view. One might wonder, for example, whether islands can intervene between allegedly base-generated wh-phrases and their traces. In fact, we think that there are some cases of island repair (or amelioration) under VP ellipsis, as shown by the contrast between (i) and (ii):

- (i) ? I examined every student that John asked when Mary would
- (ii) *I examined every student that John asked when Mary would examine

However, these data have to be treated carefully. There is a large literature (Ross 1969, Chomsky 1972, Chung et al. 1995, Merchant 2001, Fox and Lasnik 2003 among others) that shows that island repair under deletion occurs even in very clear cases of movement. This implies that the absence of island effects in deletion contexts is not a reliable diagnostic for the absence of movement.

originally occupied. Then the LF copying approach would force you to treat an example like (16a) as follows.

- (16) a. I know whose mother Mary talked to *t*, and whose mother Bill didn't
b. desired LF: I know who Mary talked to *t*'s mother, and who Bill didn't
talk to *t*'s mother
- (17) a. *I know whose mother Mary talked to *t*, and who Bill didn't.
b. not a desired LF: I know who Mary talked to *t*'s mother, and who Bill
didn't talk to *t*'s mother

First, reconstruction would take place in the first conjunct, forming the VP *talk to t's mother*. Then this VP would be copied into the second conjunct, forming *whose mother Bill talked to t's mother*. Then, interpretation would work in such a way that the only part of the *wh*-phrase that gets interpreted in the second conjunct is *who*. But this approach would seem to make wrong predictions for cases like (17a). (17a) should mean just what (16a) does, since we would copy just the same material, and *who* is all that we find in the *wh*-phrase of the second conjunct. The PF deletion approach, by contrast, does not make this prediction. Arguably, for the second conjunct of (17a) to have the LF of the second conjunct in (17b), we would have to produce it starting from a complete clause of the form *Bill didn't talk to whose mother*, and independent morpho-phonological constraints prevent us from moving *who* alone in a clause like that. Note that (17a) *also* cannot mean that I know who Bill didn't talk to. This is expected too: on the LF required for this, the VP in the first conjunct would be *talk to t's mother* and the VP in the second conjunct would be *talk to t*, and it is natural to think that such a representation would not satisfy the identity condition on ellipsis. More generally, as Merchant (2001) has observed for parallel cases of sluicing, we can only create ellipsis examples with two *wh*-extractions when the *wh*-phrase in the ellipsis clause "matches" the *wh*-phrase in the antecedent clause (here, we have seen that we cannot have a *who*-phrase in the ellipsis clause and a *whose*-phrase in the antecedent clause). The PF deletion approach seems better suited to deal with matching effects.

We thus tentatively adopt the PF deletion approach to VP ellipsis. A well known consequence is that, in some manner, information about what gets deleted at PF must be available at LF. ACD examples like (18) lead naturally to the conclusion that the identity condition on ellipsis applies at LF: at spell-out, there is no VP that the deleted VP is identical to, but at LF – thanks to QR – there is. So apparently there is a condition that applies at LF and that determines whether PF-deleted material is identical to other material. For our purposes here, we endorse Merchant's (2001) approach to this issue.²⁰ On this approach, there is a silent head *E* that combines with the VP in all VP ellipsis sentences – the syntactic representations of (18) thus look more as in (19') than as in (19). *E*'s role at PF is to issue an instruction to the articulatory component to leave its complement unpronounced; *E*'s role at LF is to convey that its

²⁰ See Lobeck (1995) for further discussion of the issue.

complement is subject to an identity condition. In Section 6, we will return to this silent head *E*, and suggest that it might contribute to the explanation of the cross-linguistic distribution of VP ellipsis.

(18) I examine every student (that) John does

(19) a. spell-out: I examine [_{DP} every student [_{CP} OP that [_{IP} John does [_{VP} examine t]]]]

b. LF: [_{DP} every student [_{CP} OP that [_{IP} John does [_{VP} examine t]]]] I [_{VP} examine t]

(19') a. spell-out: I examine [_{DP} every student [_{CP} OP that [_{IP} John does **E** [_{VP} examine t]]]]

b. LF: [_{DP} every student [_{CP} OP that [_{IP} John does **E** [_{VP} examine t]]]] I [_{VP} examine t]

We would like to conclude this section with some remarks about a peculiar property of ACD that often goes unnoticed (and for which no explanation has been given, to the best of our knowledge). Apparently, in ACD constructions, the relative operator can never be overtly expressed. For example, there is a clear contrast between (18) and (20). A similar contrast is found in other pairs of sentences, like (21) and (22).

(20) ?? I examine every student who(m) John does

(21) I talk to every boy (that) you do

(22) ?? I talk to every boy who(m) you do

We would like to suggest that we can get a handle on this phenomenon if we assume that in examples like (18) – contrary to what we indicated in (19a) – the relative operator moves covertly.^{21, 22} On this way of looking at things, it is specifically *overt* movement of a relative operator that creates problems in ACD constructions. Covert movement saves a relative operator. A reviewer suggested an interesting explanation for this that is inspired by Lasnik's (1999) account of pseudogapping and roughly amounts to the following: relative operators are required to move overtly unless they are contained in an unpronounced constituent; overt movement doesn't occur when it doesn't have to.²³ On this explanation, what is wrong with overt movement of the relative

²¹ It suffices for us to assume that null categories can move covertly, and this seems to be the null hypothesis.

²² A very similar idea is defended in Kennedy 2002. Kennedy argues that, in comparative clauses, a kind of movement (of an unpronounced item) that normally occurs before spell-out does *not* occur before spell-out when the source position is inside an elided VP. Kennedy presents his analysis in Optimality Theoretic terms.

²³ The reviewer suggests the following implementation, which assumes, in the spirit of Chomsky (1995), that covert movement is feature movement, instead of movement of a full category. "All things being equal, it's most economical to just move features, but

operator in ACD examples is that it is unnecessary -- it occurs out of an unpronounced constituent. (Note that an explanation of this kind doesn't imply that overt extraction from ellipsis sites will *always* be impossible: it will be impossible only if there are no additional factors forcing overt movement. We have seen that, in examples like (15), an interrogative phrase can be extracted. There, one could say that movement is forced by the condition that Spec, CP of an interrogative clause must be overtly filled in English.) These are speculations about why it is that covert movement would save a relative operator. But the main point is that the diagnosis that covert movement saves a relative operator makes sense only on the PF deletion approach: on the LF copying approach (or at least its simplest implementation), the relative operator in (18) could not be in its final position at LF without being there before as well.

To summarize, at this point we have: (i) established that the semantic copying approach is inadequate for VP ellipsis but is promising for VP anaphora; (ii) suggested that the PF approach to VP ellipsis seems preferable to the LF copying approach. In passing we have indicated the kinds of assumptions that a PF approach must make in order to treat VP ellipsis in ACD examples.

5. When VP anaphora is possible and VP ellipsis is not

In section 3, we were concerned with the fact that, if we start with a VP ellipsis sentence and create a counterpart sentence in which a VP anaphor "occupies the ellipsis site," we do not always wind up with a grammatical sentence with the same interpretations. This suggests that VP ellipsis admits a kind of analysis that VP anaphora does not. The reverse is also the case, however. If we start with a VP anaphor sentence and create a counterpart sentence in which the VP is elided, we do not always wind up with a grammatical sentence with the same interpretations. This suggests that VP anaphora admits a kind of analysis that VP ellipsis does not.

There is one well known way in which VP anaphora is "more permissive" than VP ellipsis. The former allows a "non-linguistic antecedent" much more freely -- a speaker could say after coughing violently "I did that to catch your attention" but not "I did to catch your attention." There seem to be other ways as well. One, we have noticed, is subject to some variation across speakers. Speakers like the native English-speaking author of this paper (O.P.) do not seem to admit VP ellipsis counterparts to the kinds of VP anaphora

most of the time (in English), you also have to move the lexical material associated with these features or you run into some sort of violation at PF. The way to avoid this PF violation is to not pronounce the lexical material from which the features have moved; one way to achieve this is to ensure that it's part of a deleted constituent." (20) and (22), which exhibit category movement, are uneconomical, since we could have moved features only and escaped without a PF violation. By contrast, category movement is motivated in sentences like *I talk to every boy to whom you talk* or *I examine every student who(m) John examines*, since we *couldn't* have moved features only without incurring a PF violation.

examples that we focused on in the previous sections. For these speakers, (23a) – unlike (23b) -- cannot mean that I examined every boy who asked me to examine him, and (24a) – unlike (24b) -- cannot mean that I introduced her to everyone who wanted me to introduce her to him. These judgments contradict other judgments that have been reported in the literature (e.g. Haik 1987), and that hold for some other speakers.

- (23) a. I examined every boy who asked me to.
 b. I examined every boy who asked me to do that.
- (24) a. I introduced her to everyone who wanted me to.
 b. I introduced her to everyone who wanted me to do that.

The behavior of speakers like O.P. is somewhat complicated to describe. The generalization can be expressed if we assume the PF deletion approach to VP ellipsis, and if we assume that the “identity” condition on unpronounced VPs is sensitive to syntax -- let us say that an elided VP must be “sufficiently identical” syntactically to another VP. For O.P., pronouns do not count as “sufficiently identical” to traces in cases where their binders are not the same – though they *do* count as “sufficiently identical” to traces in cases where their binders *are* the same. For O.P., what is going wrong in (23a)/(24a), then, is that the intended meaning would come from a sentence in which a VP with a pronoun goes unpronounced ((23’a)/(24’a)), but where the pronoun does not have the same binder as the trace in the parallel position of the “antecedent VP.” (The relevant LFs are given in (23’b)/(24’b). Note that, while the pronoun and the trace left by QR both have the same index 1, the binder index that binds the pronoun is at the top of the relative clause, while the binder index that binds the trace left by QR is at the top of the matrix clause.)

- (23’) a. I examined every boy who t asked me to ~~examine him~~.
 b. required LF: $[_{IP} [_{DP} \text{every boy who } [\mathbf{1} [_{IP} t_1 \text{ asked me to } \mathbf{examine} \underline{\mathbf{him}}_1]]] [\mathbf{1} [_{IP} I \mathbf{examined} \underline{\mathbf{t}}_1]]]]$
- (24’) a. I introduced her to everyone who t wanted me to ~~introduce her to him~~.
 b. required LF: $[_{IP} [_{DP} \text{everyone who } [\mathbf{1} [_{IP} t_1 \text{ wanted me to } \mathbf{introduce} \mathbf{her} \text{ to } \underline{\mathbf{him}}_1]]] [\mathbf{1} [_{IP} I \mathbf{introduced} \mathbf{her} \text{ to } \underline{\mathbf{t}}_1]]]]$

The reason for saying that pronouns *do* count as “sufficiently identical” to traces in cases where their binders are the same is that, for speakers like O.P., sentences like (25a) and (26a) behave differently. (25a) can naturally be understood as saying that I examined every boy before you examined him, and (26a) can naturally be understood as saying that I introduced every woman to everyone she wanted me to introduce her to. We can explain why if we say that these sentences involve ellipsis of a VP with a pronoun, and, in that case, in the relevant LFs, the pronoun would have the same binder as the trace in the parallel position of the “antecedent VP.” (Note that, in the LFs in (25c)/(26c), both are bound by the binder index below the quantifier at the top.)

- (25) a. I examined every boy before you did.
 b. I examined every boy before you ~~examined him~~.
 c. required LF: [IP [DP every boy] [1 [IP I **examined** t₁ before you **examined** him₁]]]
- (26) a. I introduced every woman to everyone she wanted me to.
 b. I introduced every woman to everyone she wanted me to ~~introduce her~~ ~~to~~.
 c. required LF: [IP [DP every woman] [1 [[DP everyone 2 she₁ wanted me to **introduce** her₁ to t₂] [2 [IP I **introduced** t₁ to t₂]]]]]

Why should there be these apparent differences across speakers? A speculation might be that in fact all speakers behave identically where phonetic deletion of complex VPs is concerned – all speakers apply the same identity condition and have the same criteria for “sufficient identity” – but that the speakers unlike O.P. have in their lexicon a “null” VP anaphor that receives no pronunciation at all. These latter speakers would allow (23a) to mean what (23b) means because they would allow a structure for (23a) with the silent anaphor in the place of *do that*, interpreted in just the way *do that* is interpreted. Essentially, these speakers, for some sentences with unpronounced VPs, would allow a semantic copying analysis in addition to a PF deletion analysis.^{24, 25} This analysis raises obvious questions – do the same speakers that allow (23a) to mean (23b) also allow “non-linguistic antecedents” for examples like (23a)? are there any unpronounced VPs for which these speakers do *not* allow a semantic copying analysis in addition to a PF deletion analysis? However,

²⁴ Hoji (2003) argues for a similar conclusion on the basis of different evidence. For him, too, while most sentences with unpronounced VPs involve copying or deletion, a few seem to contain a silent anaphor instead.

A reviewer notes that, if the silent anaphor we have posited is really interpreted in just the way *do that* is interpreted, speakers unlike O.P. should not allow a sentence like (ia) to mean that I admire most of the people who think I admire them. This is because a parallel sentence with *do that* ((ia)) cannot convey this (for reasons relating to the stativity of *think*, cf. note 16). Similar remarks apply to (ib). The reviewer, who is a speaker unlike O.P., reports that in his case these predictions are correct.

- (i) a. I admire most of the people who think I do.
 b. I'm proud of every student who thought I would (be).
 (ii) a. # ... who think I do that.
 b. # ... who thought I would do that.

²⁵ There are other respects in which O.P.'s judgments are more restrictive than those sometimes reported. For instance, O.P. does not allow the often cited reading for (i) on which neither of them can realize his desire. A natural conclusion is that readings like this are also due to the presence of a null anaphor, although one might question here whether the anaphor is really interpreted in just the way *do that* is (it seems to us that “neither of them can do that” expresses this meaning awkwardly at best). We thank an anonymous reviewer for bringing up these examples.

(i) Wendy is eager to sail around the world and Bruce is eager to climb Kilimanjaro, but neither of them can because money is too tight. (Webber 1978)

whether or not our speculation is correct here, we can think of another case where this kind of approach seems plausible. It concerns Italian.

While Italian contains a VP anaphor that behaves very like English *do that*, Italian is different from English in that it does not make productive use of VP ellipsis. Since Italian does not have *do*-support at all, there is nothing like VP ellipsis with auxiliary *do*. And sentences like those in (27) are sharply out. The only sentences that are potential candidates for VP ellipsis of the English type are sentences like those in (28), where the “missing structure” is introduced by a modal verb²⁶.

- (27) a. **Tu hai mangiato la pizza e anche io ho.*
 ‘You have eaten the pizza and also I have’
 b. **Tu sei arrivato tardi e anche io sono.*
 ‘You are arrived late and also I am’
- (28) a. *Vorrei mangiare la pizza e anche Gianni vorrebbe ~~mangiare la pizza~~*
 ‘(I) want to eat the pizza and also Gianni wants’
 b. *Dovrei mangiare la pizza e anche Gianni dovrebbe ~~mangiare la pizza~~*
 ‘(I) must eat the pizza and also Gianni must’
 c. *Potrei mangiare la pizza e anche Gianni potrebbe ~~mangiare la pizza~~*
 ‘(I) can eat the pizza and also Gianni can’

We think it likely, however, that these sentences actually contain something like a silent *do that* -- so, really, there is no VP ellipsis in Italian at all. Our reasons are as follows. First, the sentences in (28) all admit a counterpart with the overt VP anaphor *farlo* in the position of the “null” VP. Second, if the sentences in (28) involved VP ellipsis of the English kind, we would expect to find ACD configurations of the English kind, but in fact sentences like (29) are ungrammatical.²⁷ If the apparent cases of ellipsis actually involve a silent anaphor, it is clear why: the silent anaphor blocks a source position for the relative operator, as was the case for the examples we considered in section 3. This diagnosis implies that sentences of this kind should become grammatical if we modify them by adding a piece of structure that can accommodate the trace of the relative operator, and this prediction seems correct. (30a) is acceptable, and has the interpretation “I want to examine every boy who asked if I wanted to examine him,” which is unsurprising if its structure is basically as in (30b).²⁸

²⁶ In fact, modal verbs might take a structure bigger than VP as a complement (an IP or a functional projection in the IP field). We will not go into this issue here: the most important aspect of our claim is that the missing structure in the sentences we are discussing is a null anaphor. However, the question should be investigated in order to understand which portion of the syntactic structure the anaphor occupies.

²⁷ We thank Fabio del Prete for this observation.

²⁸ For reasons that are not completely clear to us, with other modal verbs the interpretation we would expect is not fully natural. For instance, (i) and (ii) do not naturally give rise to the interpretations “I should examine every boy who asked if I had to examine him” and “I could examine every boy who asked if I could examine

- (29) a. **Vorrei interrogare ogni ragazzo che Gianni vorrebbe interrogare*
 b. **Potrei mangiare ogni pizza che Gianni potrebbe mangiare*
 c. **Dovrei mangiare ogni pizza che Gianni dovrebbe mangiare*
- (30) a. *Vorrei interrogare ogni ragazzo che ha chiesto se io volessi.*
 ‘I want to examine every boy who has asked if I wanted’
 b. *Vorrei interrogare ogni ragazzo OP che t ha chiesto se io volessi \emptyset_{farlo} .*

The Italian candidates for English-type ellipsis, then, are better analyzed as containing a silent VP anaphor.

In sum, we have suggested here that a few special cases of “null” VPs should be exceptionally analyzed as involving the presence of an anaphor, rather than PF deletion (or LF copying). This idea in turn reinforces the hypothesis that PF deletion is blocked when a pronoun in the elided VP and a trace in the corresponding position in the antecedent VP do not have the same binder. This further identity condition (if we are on the right track) should be taken into consideration in future work on when PF deletion is possible.

6. Why is VP ellipsis absent in Italian?

In the previous section, we argued that Italian does not exhibit VP ellipsis of the English type. Here we briefly address why this is so.

Earlier, we mentioned the hypothesis (essentially due to Merchant) that PF deletion of VPs is due to the presence of a silent head *E* which combines with the VP and tells the articulatory component “Don’t pronounce my complement.” *E* is a possible lexical item, and part of the lexicon of English. This hypothesis can help to account for the restrictions on where VP ellipsis can occur in English. Assuming that *E* blocks verb movement -- as should follow from some version of the Head Movement Constraint -- a language that has *E* should allow VP ellipsis only in cases where the verb does not need to move to the INFL node. As far as English is concerned, this seems to be what happens. In English, the verb can remain inside the VP when *do*-support is present, or when the INFL node is occupied by an auxiliary, and here we see that ellipsis is possible:

- (31) a. I like everyone Bill does.
 b. I like everyone Bill does E ~~{like t}~~

him.” However, (i) and (ii) on these interpretations are significantly better than the sentences in (29), which are totally unacceptable.

- (i) ? *Dovrei interrogare ogni ragazzo che t ha chiesto se io dovessi (farlo)*
 ‘(I) must examine every boy that has asked if I must (do that)’
 (ii) ? *Potrei interrogare ogni ragazzo che t ha chiesto se io potessi (farlo)*
 ‘(I) can examine every boy that has asked if I can (do that)’

- (32) a. I have eaten pizza and John has, too.
 b. I have eaten pizza and John has E [~~eaten pizza~~], too.

By contrast, ellipsis is impossible in cases where there is no support for tense and agreement features:

- (33) a. *I like everyone Bill
 b. *I like everyone Bill INFL E [~~likes-t~~]

Now imagine a language that, unlike English, typically requires the verb to move out of the VP. Such a language, even if it had *E* in its lexicon, would rarely use it, since the use of *E* would be incompatible with the presence of verb movement. Since evidence for the presence of *E* would be sparse in languages that make extensive use of verb movement, acquisition considerations suggest that *E* will not appear in such languages. Italian is a language of this kind. In Italian, the verb must move out of the VP (arguably due to its morphological richness). Accordingly, we wouldn't expect to see much evidence of VP ellipsis even if it had *E*, and acquisition considerations suggest that it is unlikely that Italian would have *E* at all.

Take an example like (27a) above (repeated as (34a)). Arguably, even if Italian had *E*, we would be unable to generate this sentence. The only way of doing so would be with a structure like (34b), but it has been argued (cf. Belletti 1990 among others) that structures like this are unavailable: past participles like *mangiato* cannot stay confined to the VP. Evidence that the Italian past participle overtly moves out of the VP comes from the fact that it appears to the left of VP-peripheral elements like low adverbs (cf. (35)) and floating quantifiers (cf. (36)).²⁹

- (34) a. **Tu hai mangiato la pizza e anche io ho.*
 b. *Tu hai mangiato la pizza e anche io ho* E [~~VP-mangiato la pizza~~]

- (35) *I ragazzi hanno mangiato spesso la pizza*
 'The boys have eaten often the pizza'

- (36) *I ragazzi hanno mangiato tutti la pizza*
 'The boys have eaten all the pizza'

If Italian had *E*, where would we expect to find ellipsis? There are a few cases where verb movement is not obviously necessary in Italian. In the last section, we considered one: infinitival complements of modal verbs. But even there, we argued, although it seems on the surface that ellipsis is possible, this

²⁹ Note that there is a clear contrast here with English. In English, the past participle does not move out of the VP, as indicated by the ungrammaticality of the English counterparts of (35) and (36):

- (i) *The boys have eaten often pizza
 (ii) *The boys have eaten all pizza

phenomenon is not PF deletion of the English type. Italian, then, does not have *E*, and the language acquisition considerations we cited above make this natural.

On the approach we have just sketched, the reason why Italian lacks VP ellipsis is that the null head triggering PF deletion interferes with the (generally) obligatory movement of the head of the VP. This account is appealingly simple. It links the fact that VP ellipsis cannot occur in Italian in any context to the fact that VP ellipsis cannot occur in English in some contexts (those where the verb moves). And, obviously, it depends on the idea that PF deletion can *only* be caused by the null head that blocks verb movement.³⁰ Perhaps it is too simple. McCloskey (1991) and Goldberg (2005) have argued that VP ellipsis of the English type is present in some languages that, like Italian, display overt verb movement out of the VP. In Hebrew and Irish, they argue, verbs outside the VP can be pronounced while material that remains within the VP gets deleted, giving rise to question-answer sequences like (37). This poses a clear problem for our account, which implies that VP ellipsis should not be possible in sentences with verb movement. It is true that superficially examples of this kind resemble null object constructions, but Goldberg discusses a set of tests that indicate that the relevant construction in Hebrew and Irish is the same construction that is called VP ellipsis in English. If Goldberg's conclusions are right, then the source of PF deletion can be something other than a null head that blocks verb movement. And this reopens the issue of why Italian lacks VP ellipsis. Evidently, more research is needed to settle this question.

- (37) a. Will you invite John?
b. I already invited [_{VP} ~~John~~]

7. Conclusion and loose ends

In this paper, we reconsidered the issue of what process underlies VP ellipsis in English. By systematically comparing VP ellipsis with VP anaphora, we reached the conclusion that a semantic copying approach is inadequate for VP ellipsis but works pretty well for VP anaphora. We also suggested that a PF deletion theory of VP ellipsis will turn out to be more adequate than an LF copying theory, and we cast our explanation for the absence of VP ellipsis in Italian in terms of the PF deletion theory of VP ellipsis.

Since VP ellipsis has been investigated much more extensively than VP anaphora, we were interested in investigating whether the properties of VP ellipsis that have been described in the literature hold for VP anaphora, and whether the explanations proposed for the former construction can be extended to the latter. We presented cases where VP ellipsis seems to be more permissive than VP anaphora, and this allowed us to draw some conclusions about the

³⁰ See Donati (2002) for a different explanation for why VP ellipsis of the English type is impossible in Italian. Donati capitalizes on the fact that V moves *overtly* in Italian but *covertly* in English.

semantic copying mechanism that underlies VP anaphora. We then discussed cases that go in the opposite direction. We saw that VP anaphora is more liberal than VP ellipsis not only because it admits a non-linguistic antecedent more freely, but also in more subtle ways, that sharpen our understanding of the syntactic “identity” condition on unpronounced VPs.

This paper did not offer a comprehensive theory of VP ellipsis and VP anaphora. It did add some new data and some new ideas to the debates concerning these phenomena. And, more generally, it showed that examining VP anaphora can provide a useful perspective on issues that arise in the study of VP ellipsis. We would like to conclude this paper by recalling another case where a consideration of VP anaphora is useful.³¹

Pairs of sentences like those in (38) have received a fair amount of attention in the ACD literature. (38) can be understood as saying that I introduced Mary to everyone she wanted me to *introduce her to*, while (39) *cannot* be understood as saying that I introduced Mary to everyone she wanted me to *introduce herself to*. It thus seems that the elided VP in (39) cannot have the same meaning that the elided VP in (38) does.

(38) I introduced Mary to everyone she wanted me to
(OK interpretation: I introduced Mary to everyone she wanted me to *introduce her to*.)

(39) # I introduced Mary to everyone I wanted her to.
(impossible interpretation: I introduced Mary to everyone I wanted her to *introduce herself to*.)

This contrast has received attention in the context of discussions of “Vehicle Change.”³² This discussion assumes as background that elided VP material must be syntactically identical to antecedent VP material. On this assumption, the acceptability of (38) on the relevant reading is not expected: the elided VP in (38) would have to contain the R-expression *Mary*, and Condition C should then block the interpretation on which *she* and *Mary* are coreferential:

(38’) LF: [_{DP} everyone [_{CP} OP [_{IP} **she** wanted me to [_{VP} introduce **Mary** to *t*]]]]
I [_{VP} introduced Mary to *t*]

To circumvent this problem, Fiengo and May (1994) propose essentially that after the identity condition is satisfied, a proper name can be replaced by a pronoun. (The process by which this takes place is called “Vehicle Change”.) After this replacement, the LF of (38) is (38’), Condition C is no longer relevant, *she* and *her* can be coreferential, and we arrive at the desired interpretation.

³¹ In many respects this discussion echoes points that have been made before. See especially Dalrymple 1991.

³² Cf. Fiengo and May 1994, p. 275-280 for data presentation and for an early discussion of Vehicle Change.

(38') [_{DP} everyone [_{CP} OP [_{IP} **she** wanted me to [_{VP} introduce **her** to *t*]]] I [_{VP} introduced Mary to *t*]

(39) is relevant to this discussion in that, if Vehicle Change can only change a name to a pronoun, (39) is correctly predicted to lack the reading we mentioned. This interpretation cannot arise from an LF to which Vehicle Change has not applied ((39')), without incurring a Condition C violation. And it cannot arise from an LF to which Vehicle Change *has* applied ((39'')), without incurring a Condition B violation:

(39') * [_{DP} everyone [_{CP} OP [_{IP} I wanted **her** to [_{VP} introduce **Mary** to *t*]]] I [_{VP} introduced Mary to *t*]

(39'') * [_{DP} everyone [_{CP} OP [_{IP} I wanted **her** to [_{VP} introduce **her** to *t*]]] I [_{VP} introduced Mary to *t*]

The idea of Vehicle Change is subject to criticism – for one thing, this mechanism must be restricted to VP ellipsis constructions, since we do not want to be able to use it to save canonical Condition C violations like **She_i said that Mary_i saw John*. However, the idea behind this proposal could be expressed easily enough in other terms. One might just say that the identity condition on ellipsis is loose enough to allow pronouns in those positions of elided VPs where we find names in the antecedent VP. The basic approach to these facts, then, would be that in (38) and (39) independent factors allow the elided VP to be *introduce her to t*, but not, say, *introduce herself to t*. Conditions on pronominal reference then permit the desired interpretation for (38) but not for (39).

The point we want to make is that a look at VP anaphora suggests another perspective on these facts. Parallel to the pairs involving VP ellipsis, we find similar pairs involving VP anaphors. (40) can be understood as saying that I introduced Mary to everyone who wanted me to introduce her to him, but (41) *cannot* be understood as saying that I introduced Mary to everyone who wanted her to introduce *herself to him*. It thus seems that the VP anaphor in (41) cannot have the same meaning that the VP anaphor in (40) does. However, since we have seen that VP anaphors are unanalyzed items, we certainly cannot attribute *this* effect to the existence of a pronoun within VP. It seems, then, that something else is going on. We conjecture that, when it comes to expressing what we would like (39) and (41) to express, there is just something wrong with using a VP with the kind of denotation that we would get from a VP with a pronoun coreferential with *Mary*. The right explanation for the puzzle regarding (39) and (41) should probably be sought in the theoretical domain that deals with effects like “Rule I” effects.³³

³³ Guglielmo Cinque brought to our attention examples like (i). We seem to wrongly predict that (i) could have the meaning that I examined everyone who promised me to examine *himself*. We would obtain this meaning from an LF like (ii), where the semantic value of *do that* is identified with the semantic value of the matrix VP. We conjecture that this puzzle belongs to the same category as the puzzle we just

- (40) I introduced Mary to everyone who wanted me to do that.
 (OK interpretation: I introduced Mary to everyone who wanted me to
introduce her to him.)
- (41) # I introduced Mary to everyone who wanted her to do that.
 (impossible interpretation: I introduced Mary to everyone who wanted
 her to *introduce herself to him.*)

Here, then, is another case where approaches to VP ellipsis facts have to be revised, if they are to be general enough to cover parallel cases in the VP anaphora domain.

Appendix

In our initial discussion of VP anaphora, we adopted Cecchetto's proposal that, in cases where there is no clear extralinguistic source for VP anaphora resolution, VP anaphors must have the meaning of another VP present at LF. This proposal, together with some assumptions about what the LFs for quantificational structures with relative clauses look like, was enough to explain the pattern we considered – in a sentence like (42), when we imagine that the quantifier takes scope outside the clause, we naturally understand *do that* in a way that we do not when we hear a sentence like (43) and imagine that the quantifier takes scope inside its clause. However, this proposal needs revision: it is too restrictive as it stands.

- (42) I declared everyone who imagined I would do that to be present
 (43) #I declared that everyone who imagined I would do that was present

Sometimes it seems that, in the absence of extralinguistic cues, we admit for VP anaphors certain meanings that do *not* constitute the denotations of other VPs around. Two examples are in (44) and (45).³⁴ In (44) (based on an example from Rooth 1992 without VP anaphora), *do that* is naturally understood as “divides into itself exactly once.” In (45), *do that* is naturally taken as meaning “gave her son a stuffed animal.” Neither of these meanings comes from an LF constituent. The only appropriate meanings that derive from LF constituents seem to be meanings like “divides into 7 exactly once,” or

considered. There is just something wrong with a sentence that has the meaning we would arrive at in this way, and whose semantics is built up compositionally in this way. We have speculations as to precisely what is going wrong here, but explaining them would take us too far into issues regarding “Rule I”-type effects, indexing constraints at LF, and the semantics of control.

(i) I examined everyone who promised me to do that.

(ii) [_{IP} [_{DP} everyone who [_{IP} *t_I* promised me to **do that**]]] [_{IP} I **examined** *t_I*]]

³⁴ See Hoji (2003) for similar examples. Hoji's examples, however, make use of *do the same thing*, which we suspect has different properties from *do that*.

“gave Carlo a stuffed animal.” What does seem to be the case, though, is that there is another clause around that amounts to saying that some object (or group of objects) has the property in question. For instance, the first clause of (45) amounts to saying that Carlo’s mother has the property we get from “gave her son a stuffed animal.”

- (44) 7 divides into 7 exactly once. 5 does that too, of course.
 (45) Carlo’s mother gave Carlo a stuffed animal on his birthday. Then, on *my* birthday, *my* mother did that. It must be a fad.

Our earlier remarks suggested that the values for VP anaphora come from two different kinds of places. On the one hand, we determine values on the basis of actions that are psychologically salient. On the other hand, we determine values on the basis of what syntactic constituents are present at LF. Conceivably, some actions can become psychologically salient just as a result of processing linguistic material. A position that one could take, then, is that what we said about our “syntax-oriented” way of locating values is right – we only use the denotations of surrounding constituents – and that (44) and (45) are cases that involve the other way of locating values. On this view, in adopting Cecchetto’s proposal, we were just a little imprecise: we neglected that sometimes VP anaphors can be resolved in the non-“syntax-oriented” way without true extralinguistic cues. But we suspect that, in fact, what happens in (44) and (45) is *compatible* with our “syntax-oriented” way of locating values, and that this way of locating values is different from what we have been assuming – that it does not in fact restrict us to the denotations of surrounding constituents.

One reason for this suspicion is as follows. To the extent that it is natural to understand (45) as saying that my mother gave me a stuffed animal, it seems equally natural to understand (46) as saying that Carlo’s mother introduced Carlo to all those people who previously had asked *my* mother to introduce *me* to them. Now, in order to obtain this reading, *do that* must have a value that is index-dependent – it must behave as though it contains a variable bound within the relative clause. (That is, the analysis must run roughly along the lines of (47)). But recall from earlier that we feel that, in cases where the value of an anaphor is index-dependent, it is implausible to maintain that we determined the value in the non-“syntax-oriented” way. We conclude, then, that something about our “syntax-oriented” procedure must be providing the index-dependent value for the anaphor in (46), and this is just the kind of value that we would need to account for (45) as well.

- (46) Carlo’s mother introduced Carlo to everyone who previously had asked *my* mother to do that.

- (47) a. $[_{IP} [_{DP} \text{everyone who } [_{IP} t_1 \text{ had asked my mother to do that }]]]$
 $[\mathbf{1} [_{IP} \text{Carlo’s mother introduced Carlo to } t_1]]]$
 b. $[[\text{do that }]] = \lambda g. \text{the property of introducing one’s son to } g(1)$

What kind of “syntax-oriented” procedure would admit values for *do that* like those we need in (44)-(46)? A first guess might be that we assign values to VP anaphors in such a way as to satisfy the following condition. Even if the VP anaphor itself doesn’t have the same denotation as another LF constituent, you must be able to obtain something that (informally speaking) conveys the same information as another LF constituent by performing an operation like this: you take a constituent containing the VP anaphor, and you replace pieces of that constituent (other than the VP anaphor) with other entities of the same category. For example, in (47a), we can obtain an expression that carries the same information as the constituent *Carlo’s mother introduced Carlo to t₁* by taking the complement of *ask, my mother to do that*, and replacing *my* with *Carlo’s*. Interestingly, this is basically the “contrast condition” that has been discussed in the VP ellipsis literature (cf. Heim 1997, Kennedy 2004). We can’t go into the many remarks that we would like to make in this regard.³⁵ What is most relevant to us here is just that revising Cecchetto’s proposal in this way would not lead to other substantial changes in what we said, and would still allow us to distinguish (42) from (43).³⁶ It is also worth noting in passing that the VP ellipsis counterparts of (44) and (45) do not allow the interpretations that we have been discussing (cf. Rooth 1992), so here we have another phenomenon that suggests that VP anaphora admits a kind of analysis that VP ellipsis does not.

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³⁵ One worth mentioning, in light of the kinds of directions pursued in the ellipsis literature, is that any such condition on VP anaphora could not be reduced to a condition on when a VP with a given meaning can be destressed. Examples with “implicational bridging” like *First John sang an aria, and then Sue performed* allow destressing of the second VP, but the second VP cannot be replaced with *do that* and interpreted the same way.

³⁶ Followers of the VP ellipsis literature will suspect that, once we accept this condition on VP anaphora, we can also dispense with the assumptions about possible LF indexing patterns that were important to Cecchetto’s account of (42) and (43). We believe this suspicion is correct, but cannot justify this here. If this suspicion *is* correct, and you don’t believe that the indexing assumptions are tenable (see Kennedy 2004 for relevant discussion), then you have another reason for preferring this condition on VP anaphora to the simple semantic identity condition Cecchetto assumed.

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