

Wh-Movement out of the Site of VP Ellipsis*

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I. Introduction

The literature lacks a close investigation of wh-movement out of the site of VP ellipsis (VPE). An example of this phenomenon is a sentence like (1); (2) shows the intended interpretation of the embedded question in (1):

- (1) I don't know which puppy you SHOULD adopt, but I know which one you SHOULDN'T.¹
 (2) ... [CP [which one]_i [IP you shouldn't [VP ~~adopt~~-t_i]]]²

The wh-phrase *which one* has moved out of its position as the internal argument of *adopt* to front the embedded question.

Examples of wh-movement of an internal argument out of the site of VPE are cited as evidence in the on-going debate surrounding the nature of an elided VP, as will be discussed below. But the relevant examples exhibit unexplained grammaticality variation, which complicates their use as support for any theory. Sentence (3) is an ungrammatical example:

- (3) * I think you should adopt one of these puppies, but I don't know [which one]_i you should [VP ~~adopt~~-t_i].

Without an understanding of the conditions under which the phenomenon is licensed, it is hard to assess its implications for larger debates. This paper examines wh-movement out of the site of VPE in more depth and detail than has been done, resulting in a preliminary proposal which explains the grammaticality patterns of numerous examples. The proposal states that wh-movement out of an elided VP is licensed only if there is a contrastively focused element in the C-command domain of the moved wh-phrase. This licensing condition covers relativization and topicalization out of an elided VP as well and is therefore posited as a general licensing condition on A' movement out of the site of VP ellipsis.

In section II, theoretical background is presented; this includes a discussion of the role of wh-movement out of an elided VP in the debate about the nature of the VPE site. Section III accounts for the grammaticality contrast between movement of a wh-argument and movement of a wh-adjunct out of an elided VP; this allows concentration on the more interesting argument extractions. Several sets of data are presented and discussed in section IV, and in section V the main analysis is developed. Section VI concludes with some theoretical consequences of the analysis and a glance at a possible alternative approach.

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¹ Words in uppercase are intended to be focused.

² Unpronounced material is struck out. This notation reveals the assumption that there is syntax in the ellipsis site. Some evidence for this assumption will be presented later.

II. Theoretical Background

VPE itself has naturally been the focus of much work, because it irresistibly offers us “the puzzle of generating meanings from silence.” (Jason Merchant 1999, p. 2) One of the on-going debates related to VPE is the nature of that silence: is it an unpronounced syntactic copy of an overt VP in the discourse, or is it some kind of anaphoric proform? Supporters of the former theory (Fiengo & May 1994, Sag 1976, Williams 1977 and others), which is referred to as the deletion or reconstruction approach³, cite grammatical examples involving wh-movement out of an elided VP as supporting evidence.⁴ In the relevant construction, exemplified by (1), repeated from above, there is a moved, overt wh-phrase fronting an embedded question. If there is syntax in the ellipsis site, that wh-phrase is easily regarded as binding a trace that is inside the ellipsis site, as illustrated in (2), also repeated from above:

- (1) I don't know which puppy you SHOULD adopt, but I know which one you SHOULDN'T.
 (2) ... [CP [which one]_i [IP you shouldn't [VP ~~adopt~~ t_i]]]

Supporters of the proform theory claim that there is no syntax in the ellipsis site; the problem is that if there is no syntax, the wh-phrase is a disallowed vacuous operator. Therefore, goes the deletion/reconstruction argument, this type of sentence is evidence against the proform theory. Moreover, under the proform theory, the ellipsis site can be replaced with anaphoric “do it” or “do so”. And VPE-extraction examples like (1) can't host “do it” or “do so”:

- (4) * I don't know which puppy you SHOULD adopt, but I know which one you SHOULDN'T do it/so.

A possible response to these arguments is to analyze VPE extraction as an instance of pseudogapping (PG), a construction exemplified by (5):

- (5) I think Jake should adopt the black puppy, and Janet should [~~adopt~~] the brown one.

Under a PG analysis, VPE extraction involves deletion of only the verb, and the wh-phrase moves to the front of the embedded clause, from which position it unproblematically binds an unelided trace. In (6), this analysis is illustrated for (1):

- (6) I don't know which puppy you SHOULD adopt, but I know [CP [which one]_i [IP you SHOULDN'T [VP [v ~~adopt~~] t_i]]]]

Support for the PG analysis is found in the fact that PG and VPE extraction pattern together in not allowing backwards binding. For instance, in (7) the deleted verb precedes its antecedent, and the pseudogap is ungrammatical:

- (7) * Although I don't think Janet should the brown puppy, I do think Jake should adopt the black one.

³ It's the “deletion” approach to those who posit underlying syntactic structure in the ellipsis site which is subsequently deleted (unpronounced) under some brand of identity with an overt VP in the discourse. It's the “reconstruction” approach to those who posit that the content of the ellipsis site is “reconstructed” as a copy of an overt VP in the discourse at the level of logical form.

⁴ I'll hereafter use the phrase “VPE extraction” to refer to movement of an element out of the site of VPE.

And as shown in (8), backwards VPE extraction seems to be similarly prohibited:

- (8) * Although I don't know which puppy you SHOULD, I do know which one you SHOULDN'T adopt.

However, the argument against this reasoning is that there *are* constructions which do not host PG but which do host VPE extraction. For example, PG does not allow the deletion of a verb plus a preposition, while VPE does allow fronting of an interrogative pronoun that is the object of a preposition, as illustrated by the following pairs ((9) is borrowed from Johnson 1997, p. 21):

- (9) a. * While Holly didn't discuss a report about every boy, she did every girl.
 b. I know which woman HOLLY will discuss a report about, but I don't know which woman YOU will.
- (10) a. * Tom didn't go to a movie with Richard, but he did Craig.
 b. I don't know who Tom DID go to a movie with, but I know who he DIDN'T.

And finally, Fiengo and May (1994) offer (11) as yet another argument against a PG analysis of VPE extraction:

- (11) I know which book Max thinks Mary read, and which book Bill doesn't [~~think Mary read~~].
 (p. 229, ft. 31)

The ellipsis site can be interpreted as [think Mary read], as illustrated. And [think Mary read] is not a candidate for pseudogapped material; pseudogapping deletes a verb but not its complements:

- (11.5) *Max thinks Mary read *Angle of Repose*, and Bill does [~~think Mary read~~] *Crossing to Safety*.

Summarizing the last bit of discussion: VPE extraction is problematic for the proform approach to VPE and more easily accounted for by the deletion/reconstruction approach, because the latter assumes that there is syntax in the ellipsis site and therefore that the ellipsis site can host a trace of wh-movement. Attempts by proform theorists to analyze VPE extraction as cases of PG (rather than full VPE) are weakened by evidence showing that VPE extraction is possible in some constructions in which PG is disallowed.

So, again, *grammatical* examples of VPE extraction have been used to support the deletion approach to VPE. But as mentioned already, not all instances of VPE extraction are grammatical. Some of those that aren't grammatical have actually also been called upon as evidence in favor of the deletion theory of VPE. The argument is that if there is syntax in the ellipsis site, the ellipsis site should be sensitive to island effects. That is, island violations that occur inside a VPE site are expected to result in ungrammaticality. And as Chung et al. 1995 and Merchant 1999 illustrate, this expectation seems to be realized. The (a) examples of (12) and (13) contain an island violation in the absence of VPE, and the (b) examples show that the ungrammaticality persists even when the VP is not pronounced (just as is predicted if there is syntax in the ellipsis site):

- (12) a. * We left before they started playing party games. What did you leave before they started playing?
 b. * We left before they started playing party games. What did you leave before they did?
 (Chung et al. 1995)
- (13) a. * They want to hire someone who speaks a Balkan language, but I don't know which they want to hire someone who speaks.

- b. * They want to hire someone who speaks a Balkan language, but I don't know which they do. (Merchant 1999)

This issue arises in discussions of sluicing, an ellipsis process which *does* rescue island violations (Ross 1969, Chung et al. 1995, Merchant 1999); (14) exemplifies:

- (14) They want to hire someone who speaks a Balkan language, but I don't know which (Balkan language) [~~they want to hire someone who speaks~~].

Examples like (14) challenge the theory that sluicing is a process of syntactic deletion, because under such a theory the stranded wh-phrase ([which (Balkan language)] in (14)) is linked to a position inside an island. One response to this problem is to propose that the island violation is located at the position of the trace inside the island, and that the sluice disposes of the violation along with the syntactic material that is deleted (Lasnik 2000 and Merchant 1999 discuss this idea). But this proposal cannot apply equally to both sluicing and VPE, since VPE apparently doesn't rescue island violations. Contrary claims would have to be made about the island-violation examples of sluicing and VPE to analyze both ellipsis processes as straightforward deletions of syntactic material.

Again, the unexplained grammaticality variation of VPE-extraction examples is relevant. Given this grammaticality variation, it is possible that the ungrammaticality of the (b) examples of (12) and (13) is due to something other than the island violation. Perhaps once some other condition on VPE extraction is met, VPE actually does rescue island violations. Lasnik 2000 mentions this issue and provides (15) as an example of a sentence similar to (13b) but without the island:

- (15) * They want to hear a lecture about a Balkan language, but I don't know which (Balkan language) they do. (Lasnik, 2000)

The question of whether VPE rescues island violations will be reconsidered after the presentation of the main analysis of VPE extraction. We will see that, according to the analysis given here, it *is* most likely the island violation that causes the degradation of (12b) and (13b) (or at least, the degradation cannot be attributed to the proposed licensing condition on VPE extraction). But that result is significant, because the difference between sluicing and VPE (with respect to island-rescuing) remains intact and puzzling.

The arguments in favor of the deletion approach to VPE discussed in this section point toward an analysis of VPE extraction which assumes syntax in the ellipsis site. I find these arguments, with respect to the VPE-extraction facts, to be convincing. Therefore, I consider VPE-extraction constructions to arise from wh-movement out of an elided VP, and all the discussion which follows assumes this analysis.

Before addressing the relevant grammaticality variation, I turn to apparent cases of VPE extraction involving adjuncts.

III. Accounting for the Argument-Adjunct Contrast in VPE Extractions

There is a robust grammaticality contrast between extraction of an internal argument from within an elided VP and extraction of an adjunct. This contrast is apparent when a pair of examples is constructed in which one example involves adjunct extraction and the other involves internal-argument extraction, but which differ minimally in other respects. The pairs in (16) and (17) are examples.

- (16) a. I think you should adopt one of these puppies, but I don't know WHEN you should.
 b. * I think you should adopt one of these puppies, but I don't know which ONE you should.
- (17) a. I think Pete caught some crawdads, but I don't know WHY he did.
 b. * I think Pete caught some crawdads, but I don't know how MANY he did.

Adjunct extraction from within an elided VP, as represented by the (a) examples, seems always to be grammatical. Pairs like (16) and (17) show that whatever is going on in the variable argument-extraction examples, there is indeed a contrast between argument- and adjunct- extraction from within an elided VP. The way I propose to account for the adjunct cases is to claim that they do not actually involve wh-movement out of an elided VP. Rather, they involve fronting of an adjoined wh-adjunct and elision of only the *lower* VP of the adjunction structure. (18), which involves only regular VPE, shows that it is in principle possible to elide the lower VP of an adjunction structure:

- (18) a. I adopted a puppy today, and I predict that YOU will tomorrow.
 b. ... [CP that [IP YOU will [VP [VP ~~adopt a puppy~~] tomorrow]]]

Given this possibility, (19b) may be posited as the structure of the VPE-extraction-formed embedded question in (19a):

- (19) a. I think you should adopt one of these puppies, but I don't know WHEN you should.
 b. ... [CP WHEN_i [IP you should [VP [VP ~~adopt a puppy~~] t_i]]] .

The adjunct *when* starts out adjoined to the ellipsis site and is therefore not actually extracted from within the ellipsis site. My assumption is that the variable grammaticality of the wh-argument cases is linked precisely to the fact that the sentences involve *extraction from within a VPE site*—because in the relevant sentences a regular VPE *is* licensed in the absence of this extraction. The fact that there is a legitimate derivation for the Wh-adjunct cases which does *not* involve extraction means that the wh-adjunct cases do not have to be accounted for by an analysis that explains the grammaticality patterns of VPE extraction. With this assumption, we can put the adjunct cases aside and concentrate on the more complicated argument cases.

IV. VPE Extraction Data and a Preliminary Proposal

Before considering wh-movement, it is worth noting that A-movement and head-movement out of the site of VPE are grammatical. (20) is an example of A-movement out of a VPE site: the DP *the temperature* is raised from its position as the internal argument of *monitor* to (spec, IP).

- (20) The pressure should be monitored, and [the temperature]_i should be [~~monitored~~ t_i]_{VP}, too.

And (21) shows that head-movement is possible out of a VPE site, as *be* raises from V to I and then to C to front the matrix question.⁵

- (21) Roy is monitoring the pressure, but is_i Sophie t_i [~~t_i monitoring the pressure~~]_{VP} ?

But wh-movement, as we have already seen, is not as cooperative. To exemplify the problem: (22) is a grammatical example of the type of VPE extraction considered in a majority of the examples here: wh-movement to front an embedded question. (23) is an ungrammatical example of the same type (we have seen these examples already):

⁵ This is not the only possible structure for (19). The auxiliary *be* might originate in I°, in which case *be* does not raise out of the ellipsis site. However, evidence from Irish and Hebrew shows that head movement out of a VPE site is indeed possible (McCloskey 1991, Doron 1999).

- (22) I don't know which puppy you SHOULD adopt, but I know [which one]_i you SHOULDN'T
[~~adopt t_i~~]_{VP}
- (23) * I think you should adopt one of these puppies, but I don't know [which ONE]_i you
should [~~adopt t_i~~]_{VP}.

Considering the versions of (23) involving a sluice and involving an overt VP helps confirm the ungrammaticality of (23), as it is clearly degraded compared to (24) and (25):

- (24) I think you should adopt one of these puppies, but I don't know which ONE (or WHICH one).
- (25) I think you should adopt one of these puppies, but I don't know which ONE you should adopt.

Before looking at the data, some assumptions and terminology are necessary to facilitate discussion and to divide the examples up into manageable sets. "Contrastive focus" turns out to be involved in the grammaticality patterns of VPE extraction. In general terms, focus is phonologically realized as an increase in intensity and in some cases tone; one purpose that focus serves is to mark expressions that contrast with each other. For now I'll attempt only an informal definition of *contrast*: contrastive expressions are of the same semantic type but differ in meaning. I will return to the issue.

The following terms will be useful. The "VPE clause" refers to the smallest clause that contains the elided material (for example, the italicized clause in (26)). The "antecedent clause" refers to the smallest clause that contains the elided VP's antecedent (for example, the singly underlined clause in (26)). The "matrix material" refers to any material that dominates the VPE clause or the antecedent clause; this does not include the VPE clause or the antecedent clause—the matrix material is not a constituent. Matrix material is doubly underlined in (26):

- (26) I think [you should adopt one of these puppies]_{antecedent clause},
and
I think [*Joe should [adopt one of these puppies]*]_{VPE clause}, too.

To give a brief overview: the organization of the initial data is the following. All sets of sentences involve wh-movement of an *argument* out of the site of VPE. The first three sets do not involve parallel extraction; "parallel extraction" refers to a sentence involving wh-movement in the antecedent clause of an element which occupies a syntactic position parallel to that of the moved wh-phrase in the VPE clause. These three sets differ from each other in the location of the main contrast between the conjuncts of the sentences. The four sets which follow the first three, which also differ from each other with respect to the location of the contrast, *do* involve parallel extraction.

No parallel extraction:

- (A) no contrast in VPE clause other than in moved Wh-phrase
(B) contrast in subject of VPE clause
(C) contrast in AUX of VPE clause

Parallel extraction:

- (D) no contrast in VPE clause other than in moved Wh-phrase
(E) contrast in subject of VPE clause
(F) contrast in AUX of VPE clause
(G) contrast only in matrix material

The data are divided up this particular way to make it easier to see how the proposal works; this organization derives only from the proposal and does not reflect anything about the organization in which sentences were presented to speakers for judgment.

The data in (A) indicate that wh-movement of an argument out of a VPE site is ungrammatical when the only VPE-clause contrast is located in the extracted wh-phrase.

(A) VPE-clause contrast—only in the moved wh-phrase (no parallel extraction):

- (27) * I think you should adopt ONE of these puppies, but I don't know [WHICH one]_i; you should [~~adopt~~_{t_i}].
- (28) * No one doubts Jan will eat SOMETHING when she arrives, but it's not clear WHAT she will.
- (29) * They said Pete caught SOME crawdads, but I don't know HOW MANY he did.
- (30) * I know we invited SOMEONE, but I can't remember WHO we did.

For comparison, consider (31) through (34); they represent the grammatical results when the sentences in (A) are modified to involve no ellipsis (the (a) examples), and to involve sluicing (the (b) examples):

- (31) a. I think you should adopt one of these puppies, but I don't know WHICH one you should adopt.
b. I think you should adopt one of these puppies, but I don't know WHICH one.
- (32) a. No one doubts Jan will eat something when she arrives, but it's not clear WHAT she will eat.
b. No one doubts Jan will eat something when she arrives, but it's not clear WHAT.
- (33) a. They said Pete caught some crawdads, but I don't know HOW MANY he caught.
b. They said Pete caught some crawdads, but I don't know HOW MANY.
- (34) a. I know we invited someone, but I can't remember WHO we invited.
b. I know we invited someone, but I can't remember WHO.

The sentences in (B), which involve contrast in the subject of the VPE clause, represent grammatical examples of VPE extraction.

(B) VPE-clause contrast—in the subject (no parallel extraction):

- (35) I think YOU should ride the TALLEST camel, but I don't know which one PHIL should.
- (36) No one doubts JAN will eat a SANDWICH when she arrives, but it's not clear what MARGE will.
- (37) They said PETE caught ELEVEN crawdads, but I don't know how many FRAN did.
- (38) I know SHARON invited LARRY, but I can't remember who JACK did.

The sentences in (C) involve contrast in the AUX (auxiliary verb or modal) of the VPE clause. They are also grammatical.

(C) VPE-clause contrast—in the AUX (no parallel extraction):

- (39) I think you SHOULD adopt one of these puppies, but I can't predict which one you actually WILL.
- (40) No one doubts Jan CAN eat a lot of cake, but it's not clear how much she actually WILL.
- (41) They said Pete MIGHT have caught a lot of crawdads, but I don't know how many he actually DID.
- (42) It's clear that they COULD invite someone, but I don't know who they ever WOULD.

The generalization which can be stated already from looking at (A), (B), and (C), is that a contrast is required, and that the contrast must be close to the ellipsis site. The grammatical examples, those in (B) and (C), involve contrast in the subject or AUX of the VPE clause. The domain that includes these two

locations can be described in two ways: either as the smallest IP dominating the ellipsis site, or as the material which intervenes between the extracted wh-phrase and the ellipsis site. Further evidence will help us argue for one over the other.

Initially during the collection of judgments, it seemed to be the case that parallel extraction improved the grammaticality of VPE extraction. For example, (44) is a big improvement over (43) (both are sentences we have seen already):

- (43) * I think you should adopt one of these puppies, but I don't know which one you should.
 (44) I don't know which puppy you should adopt, but I know which one you shouldn't.

This effect was not unexpected, because parallel extraction seemed likely to lend itself to a licensing condition based on binding at the level of logical form (LF). Various versions of LF-based identity conditions have been shown to make promising predictions for regular VPE (Sag 1976a,b; Williams 1977; Fiengo & May 1994). A possible VPE-extraction licensing condition, which would account for the differing judgments of (43) and (44), is given in (45):

- (45) *LF-Identity Condition for VPE Extraction:*
 A VP containing a trace bound by an outside Wh-operator can be elided only if its antecedent contains a syntactically parallel trace bound by an outside Wh-operator.

Condition (45) would predict that sentences which do not involve parallel extraction would not be candidates for grammatical VPE. But as we have seen, the sentences in (B) and (C) lack parallel extraction, and they are acceptable. An example repeated from (C):

- (46) I think you SHOULD adopt one of these puppies, but I can't predict which one you actually WILL.

These examples show that an LF-based identity condition like (45) does not account for the VPE-extraction facts. Considering the remaining parallel-extraction examples will lead to a contrast-based licensing condition, as anticipated by our observations of sets (A), (B), and (C).

The sentences in set (D) involve parallel extraction, and they exhibit contrast in the Wh-phrase but in no other element of the VPE clause. They are found by many speakers to be degraded: worse than the sentences in (B) and (C) but not quite as bad as those in (A).

(D) Parallel extraction; VPE-clause contrast—only in the moved Wh-phrase:

- (47) ? I don't know which PUPPY you₃ should adopt, but I know which KITTEN you₃ should.
 (48) ? Some guests wondered WHAT Jan₃ would eat, and other guests wondered HOW MUCH she₃ would.
 (49) ? How many CRAWDADS did Pete₃ catch? I don't know, but I know how many LOBSTERS he₃ did.
 (50) ? I'll tell you which STUDENTS we₃ can invite, but I'm still unsure which PROFESSORS we₃ can.

In addition to being worse than the sentences in (B) and (C), the sentences in (D) are judged to be worse than versions of these sentences with an overt VP.

The examples in (E) involve parallel extraction and contrasting VPE-clause subjects. They are grammatical.

(E) *Parallel extraction; VPE-clause contrast—in the subject:*

- (51) I don't know which puppy YOU should adopt, but I know which one TONI should.
 (52) Some guests wondered what JAN would eat, and other guests wondered what BOB would.
 (53) How many crawdads did PETE catch? I don't know, but I know how many FRAN did.
 (54) I'll tell you who PAUL invited, but that won't provide any clues about who BRENDA did.

Set (F) includes sentences with contrasting VPE-clause AUXs. They are also grammatical.

(F) *Parallel extraction; VPE-clause contrast—in the AUX:*

- (55) I don't know which puppy you SHOULD adopt, but I know which one you SHOULDN'T.
 (56) Everyone knows what Jan WILL eat and what she WON'T.
 (57) They mentioned how many crawdads Pete TRIED to catch, but I don't know how many he actually DID.
 (58) I'll tell you who we COULD invite, but I can't say who we actually WILL.

In (G), there is contrast in the matrix material, and there's *no* contrast at all in the VPE clause. The examples in (G) are ungrammatical.

(G) *Parallel extraction; no VPE-clause contrast; only matrix-material contrast:*

- (59) * PETE knows which puppy you₃ should adopt, but JAN doesn't know which one you₃ should.
 (60) * SOME guests wondered what Jan₃ would eat, but OTHER guests already knew what she₃ would.
 (61) * Do you know how many crawdads Pete₃ caught? No, I don't, but LAURA knows how many he₃ did.
 (62) * MAGGIE doesn't know who we₃ can invite, but SARA can tell you who we₃ can.

The sentence-type in (G)—parallel extraction and only matrix-material contrast—wasn't possible in the sets lacking parallel extraction, because in those sets there was no way to prevent the *wh*-phrase from contrasting with the corresponding internal argument in the antecedent clause. In other words, the only way for the extracted *wh*-phrase to be *non*-contrastive with its syntactic correspondent is when there's parallel extraction in the antecedent (as in (G)), because that's the only situation in which the syntactic correspondent is also a *wh*-expression. I will come back to this issue later and argue differently.

The same generalization emerges from (D) through (G) as was formulated for the data in (A), (B), and (C): the grammatical examples involve contrast in the subject or AUX of the VPE clause. This requirement does not hold for regular VPE, or for A-movement or head-movement out of a VPE site; this is illustrated by (63) through (65), in which there is no contrast in the subject or AUX of the VPE clause but no degradation occurs:

- (63) JOE said he thought I'd ridden a camel, and SUE said she thought [_{IP} I had [~~ridden a camel~~]] too.
 (64) ROY said he thinks the pressure should be monitored, and SOPHIE said she thinks [_{IP} it should be [~~monitored~~ _{t_i}]], too.
 (65) Guess whether Roy was monitoring the pressure! I don't know; was_i [_{IP} he _{t_i} [~~monitoring the pressure~~]]?

In summary, the requirement for grammatical VPE extraction is that there be a contrast in the subject or AUX of the VPE clause. This requirement can be stated, as mentioned already, as a condition on the presence and location of contrast, and the necessary domain for contrast can be described as either the smallest IP dominating the ellipsis site or the material that is between the extracted wh-phrase and the ellipsis site; these two options are so far equivalent. Data involving topicalization and additional examples of wh-movement out of an elided VP, presented in the next section, motivate choosing the latter domain description.

V. A Contrast-Locality Condition for VPE Extraction

It has been noted that regular VPE and A-movement and head-movement out of an elided VP do not require a particular location of contrast to be grammatical, while wh-movement does. It would be unsurprising if other A' -movements shared this property with wh-movement. Relativization out of an elided VP will be the first test of this hypothesis. First, it will be assumed that the preliminary proposal in (66) is the one being tested, as it is the more restrictive of the two options for the contrast domain mentioned in the previous section:

(66) *Contrast-locality condition on VPE-extraction:*

For A' -movement out of the site of VPE to be licensed, the smallest IP dominating the elided VP must contain an expression that contrasts with its syntactic correspondent in the antecedent clause.

An examination of the following instances of relativization out of an elided VP shows that condition (66) predicts the correct patterns of grammaticality.⁶ (71) shows the assumed structure of the relative clause in (70).

no contrast in smallest IP; ungrammaticality predicted and confirmed:

(67) * I discovered that my cat had scratched some of the furniture, so I threw away the least

⁶ A brief look at antecedent-contained deletion (ACD) provides another piece of evidence in support of a contrast-locality condition for VPE extraction. A preliminary look suggests that finding a contrast in the subject or AUX immediately dominating the ellipsis site is assured in cases of ACD, regardless of what analysis of ACD is assumed. (i) and (ii) take the form of commonly cited ACDs. They involve contrast in the subject or AUX:

(i) JACK read every book (that) SALLY did.

(ii) Jack read every book (that) he COULD.

(iii), which involves no contrast in the relevant domain, is ungrammatical:

(iii) * Jack₃ read every book (that) he₃ did.

It is interesting to note in addition that the version of (iii) without VPE actually *can* be grammatical, given the appropriate context. (iv) might be stated as a purposefully uninformative answer to the question: "How many books did Jack read?"

(iv) Jack read every book that he read.

But (iii) would still be unacceptable in that context.

salvageable pieces that he had.

(68) ... [CP OP₁ that [IP he had [VP ~~scratched~~ t_i]]].

(69) * I repaired the furniture that my cat had scratched, so I was then able to sell the very pieces that he had.

(70) * I repaired the SOFA that my cat had scratched, and my sister repaired the CHAIRS that he had.

contrast in smallest IP; grammaticality predicted and confirmed:

- (71) I discovered that my cat had scratched some of the furniture, and then I sold the furniture that he HADN'T.
 (72) ? I discovered that my CAT had ruined some of the furniture, after I had already sold the furniture that my DOG had.
 (73) I sold the furniture that I knew my cat MIGHT scratch, and I kept the pieces that he already HAD.
 (74) ? I repaired the furniture that my CAT had scratched, and I threw away the furniture that my DOG had.

Relativization follows the grammaticality pattern of embedded-question wh-movement and is therefore accounted for by condition (66).⁷

Topicalization out of an elided VP provides a second test of condition (66). There are (at least) two differences between wh-movement and topicalization which are relevant to this discussion. A moved wh-phrase lands in (spec, CP), while a topicalized element lands adjoined to IP (according to one of the widely accepted theoretical assumptions regarding topicalization⁸). Additionally, a topicalized element is inherently contrastive, while a wh-phrase isn't. Together, these assumptions lead to the prediction that cases of topicalization out of an elided VP will always adhere to condition (66), because the topicalized element will always be contrastively focused and will always be inside the relevant smallest IP. That is, (66) will be met regardless of whether the subject or AUX of the VPE clause is contrastively focused. The grammaticality of (78) through (80) confirm this prediction. They represent the first six of the possible contrast locations that were considered for wh-movement, and they are all acceptable.⁹ (81) shows the assumed structure of the second conjunct of (75).

- (75) I think Pete should sign the BLUE papers, and I think the GREEN ones he should, too.
 (76) I think PETE should sign the BLUE papers, and I think the GREEN ones JAN should.
 (77) I think Pete MIGHT have signed the BLUE papers, but the GREEN ones he most definitely DID.
 (78) I think the BLUE papers Pete should sign, and I think the GREEN ones he should too.
 (79) I think the BLUE papers PETE should sign, and I think the GREEN ones JAN should.
 (80) I think the BLUE papers Pete MIGHT have signed, but the GREEN ones he most definitely

⁷ It is not ideal that (72) and (74) are not perfectly grammatical. But it is not the only place where some speakers have judged contrastive subjects to be slightly less good than contrasting AUXs.

⁸ The other assumption is that topicalization involves movement into the specifier of a topic projection below CP but above IP. I am assuming the adjunction analysis.

⁹ The sentence that is missing from the topicalization examples is one in which only matrix material is contrastively focused. This was a type that was examined for Wh-movement. The problem with a topicalized example of this type is that it requires non-contrastive (even if focused) topicalized elements. Here's an example:

- (i) * SALLY thinks that the BLUE papers Pete signed, but MARY doesn't think that the BLUE ones he did.

Its ungrammaticality is likely linked to the fact that the topicalized phrases don't contrast. Note that it is ungrammatical even in the absence of VPE extraction:

- (ii) * SALLY thinks that the BLUE papers Pete signed, but MARY doesn't think that the BLUE ones he signed.

DID.

(81) ...and I think [_{IP} [_{DP} the GREEN ones]_i [_{IP} he should [~~sign-t_i~~]] too.

These examples offer further support for adopting condition (66).

However, the picture is complicated by the construction of examples in which the VPE-extractee is moved out of the VPE clause itself, and in which there is no contrastive focus in the smallest IP dominating the ellipsis site. Sentences (82) and (83) are two such examples involving wh-movement and (84) is one involving topicalization; they are both good while condition (66) predicts them to be bad.

(82) I don't know which puppy you should adopt, but I know which one JACK thinks
[_{IP} you should].

(83) I don't know which poem Sally will recite, but I'll tell you which one I HOPE
[_{IP} she will].

(82) and (83) point toward the alternative contrast domain mentioned in section III: the domain between the extractee and the ellipsis site. In (82), the focus is on *Jack*, and *Jack* is indeed between the extracted wh-phrase and the ellipsis site, but not in the smallest IP dominating the ellipsis site. Likewise, in (83), the contrastive focus is on *hope*, which is outside the smallest IP but in the domain between extracted phrase and ellipsis site.

Additional evidence in favor of adopting this modification of (66) is found in examples of VPE extraction which strand infinitival *to*.¹⁰ It appears that the grammaticality of such examples depends on there being a contrastively focused expression between the extracted wh-phrase and the ellipsis site. In (84) and (85), the only word in this domain is *to*, which can't be focused.¹¹

(84) * Rachel would sew something if she could just figure out WHAT to.

(85) * Rachel would sew something if she could just figure out what TO.

In (86), there is material in the contrast domain (the domain between the extracted wh-phrase and the ellipsis site), and when this material contains a focused element, the result is good:

(86) Rachel would sew something if she knew what [_{CONTRAST DOMAIN} she was SUPPOSED to].

The observations for VPE extraction of wh-phrases, then, seem to require that the contrast domain be expanded to include all the material between the extractee and the ellipsis site.¹² (66) can thus be reformulated as (87):

¹⁰ I am assuming that *to* is the head of IP. I will make only brief mention of examples involving infinitival *to*; their use as examples is complicated by the restrictions on stranding *to* in regular VPE, and the lack of a widely accepted analysis of these restrictions. See Johnson 1997 for discussion and references.

¹¹ The only construction I can think of in which *to* can be focused is something like (i):

(i) We WOULD do something if there were actually anything TO do.

But this case does not involve VPE extraction. An infinitival *to* stranded by VPE cannot carry focus, as far as I have noticed.

¹² Additionally, the following examples of antecedent contained deletion (ACD)—borrowed from Jacobson 1992—support expansion of the contrast domain beyond the smallest IP (focus is mine):

- (87) *Contrast-locality condition on VPE-extraction:*
For wh-movement out of the site of VPE to be licensed, there must be a contrastively focused expression in between the VPE-extracted wh-phrase and the ellipsis site.¹³

But topicalization doesn't cooperate with this new contrast domain (which is the reason that (87) is formulated to apply specifically to extracted Wh-phrases, and not as a general condition on VPE A' - extraction). (88) illustrates this; the topicalized phrase has exited the smallest IP dominating the ellipsis site, and the result is still grammatical.

- (88) The BLUE papers I think Pete signed, and the GREEN ones I think [_{IP} he did], too.

In (88), the contrast is located inside the extracted phrase itself (the topicalized phrase) and nowhere else. It appears that for topicalization, the contrast must show up either in between the extractee and the ellipsis site, or on the extractee itself. I could claim that since there actually doesn't seem to be any constraint against topicalization out of an elided VP, a licensing condition that covers topicalization doesn't need to be posited. However, it would be preferable to posit a condition on VPE extraction that is as general as possible, and later I will do so. For now, I leave (87) as a condition on VPE wh-extraction specifically.

One final set of examples is worth considering. When the contrast is located in an adjunct within the VPE clause, the result seems to be (mostly) grammatical:

- (89) ? You should ride that FRIENDLY camel TODAY, but I don't know WHICH one you should TOMORROW.
 (90) ? I think Joe will use a WRENCH to fix the SINK, but I don't know WHAT he will to fix the RADIATOR.
 (91) ? They said Pete caught eleven crawdads when the tide was LOW, but I don't know HOW many he did after the tide came IN.
 (92) ? I was sure we had invited JILL last SUMMER, but I couldn't remember WHO we had last WINTER.

These may not be quite as good as the same sentences with overt verbs, but they are judged to be better than the worst VPE-extraction examples we've considered (for example, those in set (A), in which there is no contrast in the VPE clause aside from the wh-phrase itself). The contrastively focused adjuncts in (89) through (92) are not located between the extracted wh-phrase and the ellipsis site; they *follow* the ellipsis site. (87) thus predicts them to be ungrammatical. However, if (87) is reformulated using the notion of C-command, the fact that these sentences are not completely degraded is expected. The condition currently states that the contrast must be "in between" the extracted wh-phrase and the ellipsis site. To both capture what is meant by "in between," and to include in the domain a VP- or IP-adjoined adjunct, the domain can be described as the C-command domain of the extracted wh-phrase. However, care must be taken not to include the wh-phrase itself in the definition of C-command. We can do that by adopting the following non-reflexive definition of C-command:

- (93) *C-command:*
A node α C-commands a node β iff

-
- (i) John kissed every woman who WANTED him [_{IP} to].
 (ii) John kissed every woman who THOUGHT [_{IP} he would].

¹³ The informal "in between," in this condition is not intended as a satisfying description of a syntactic position. (87) will be reformulated yet again.

- (i) neither node dominates the other
- (ii) the mother of α dominates β

Now condition (87) can be restated more formally:

- (94) *Contrast-locality condition for VPE-extraction:*
 For wh-movement out of the site of VPE to be licensed, there must be a contrastively focused expression in the C-command domain of the VPE-extracted wh-phrase.

With a formal contrast-locality condition in hand, let's return to the problem posed by topicalization. A version of (94) generalized to include all A' extractions would make the wrong predictions about topicalization: it would disallow sentences like (95), in which the only contrastive focus is carried by the topicalized phrase itself. The contrast domain defined by (94) is bracketed:

- (95) I think Pete should sign the BLUE papers, and the GREEN ones [I think he should] too.

The topicalization examples *would* be accounted for by a generalized version of (94) if C-command were defined as a reflexive relation. This is precisely the difficulty with formulating a single condition: a wh-extractee must *not* be included in the contrast domain and a topicalized extractee *must* be included in the contrast domain. A possible solution—the one I will pursue here—to this problem would be in place if the wh-extractees did not actually carry contrastive focus. In that case, (94) would account for both wh-movement and topicalization, as long as the definition of C-command were changed to a reflexive one—and that could be done by eliminating the clause stating that neither node dominates the other, leaving us with a simpler definition:

- (96) *C-command:*
 A node α C-commands a node β iff the mother of α dominates β

To consider the plausibility of my proposal—that the wh-extractees in the relevant data do not carry contrastive focus—let's use a particular example.

- (97) * I think you should adopt [a puppy₃], but I don't know [WHICH one₃] you should.

In (97), the extracted wh-phrase *which one* carries the only focus in the VPE clause. Its syntactic correspondent in the antecedent is *a puppy*. If *which one* is contrastively focused, (94) would predict (97) to be grammatical, because there is a contrastively focused expression in the (reflexive) C-command domain of the extracted wh-phrase.

The informal definition given earlier of contrastiveness states that two expressions contrast if they are of the same semantic type but have different meanings. This informal definition doesn't provide the tools for determining whether *WHICH one* and *a puppy* contrast, because it is unclear what the "meaning" of the wh-phrase is. A formal definition of contrastiveness is necessary; the following one is taken from the literature:

- (98) *Contrasting phrases* (Rooth 1992b)¹⁴:

¹⁴ Rooth gives this definition of contrastiveness, in a slightly different form, although he dispenses with references to contrast in his final analysis of focus in the paper. I will not be using the full formal technology outlined in the literature on focus to frame my condition on VPE extraction (see Rooth 1992a,b, Merchant 1999, and Schwarzschild 1999 for discussion and references on the syntax and semantics of focus). Instead, I will use only the basic concepts and provide informal definitions; they are sufficient for my purpose here, which is simply to anchor the observations about VPE extraction within a larger theory of contrastive focus.

Construe a phrase E as contrasting with a phrase A, iff both (i) and (ii) hold:

- (i) the ordinary semantic value of A is an element of the focus semantic value of E
- (ii) the ordinary semantic values of A and E are not equivalent.

The focus semantic value of a phrase can be defined for my purposes in the following way (see footnote 14 for further comments): the focus semantic value of E is the set of ordinary semantic values that results when the focused expressions in E are replaced with all possible alternatives of the same semantic type.

For example, the focus semantic value of (99) is (100):

(99) SUE tore up the contract.

(100) {[[Sue tore up the contract]]¹⁵, [[Mary tore up the contract]], [[Joe tore up the contract]], [[Bob tore up the contract]]...[[X tore up the contract]], etc.} (where X is an individual)

To apply (98) to the example under consideration—repeated below as (101)—we must determine the ordinary and focus semantic values of *WHICH puppy*, and the ordinary semantic value of *a puppy*.

(101) * I think you should adopt [a puppy₃], but I don't know [WHICH one₃] you should.

A puppy is an indefinite noun phrase, and its ordinary semantic value is an existential quantification over individuals that are puppies. Following the literature on the semantics of wh-questions, I assume that the ordinary semantic value of *WHICH puppy* is also an existential quantification over individuals that are puppies. Therefore, the two expressions under consideration cannot be contrastive, because their ordinary semantic values are equivalent.

To finish illustrating how (98) applies to the example (even though we have already determined a lack of contrastiveness), we can note that the ordinary focus semantic value of *WHICH puppy* is the set of all existential quantifications over individuals that are puppies. The ordinary semantic value of *a puppy*, then, is certainly an element of the focus semantic value of *WHICH puppy*. It is the fact that the two phrases have equivalent ordinary semantic values that prevents them from contrasting.

We can conclude that the ungrammaticality of (101), at least, is predicted by the contrast-locality condition given in (94), because there is no contrastive focus in the C-command domain of the extracted wh-phrase. But to be satisfied that (94) covers all the data, repeated below are all the examples (in the data) in which the only focus is located in the extracted wh-phrase (which are precisely the examples that were a problem for (94) before we formalized the definition of contrastiveness).

(102) * I think you should adopt ONE of these puppies, but I don't know WHICH one you should.

(103) * No one doubts Jan will eat SOMETHING when she arrives, but it's not clear WHAT she will.

(104) * They said Pete caught SOME crawdads, but I don't know HOW MANY he did.

(105) * I know we invited SOMEONE, but I can't remember WHO we did.

(102) through (105) share the following characteristic: the extracted wh-expression's syntactic correspondent in the antecedent clause is an indefinite noun phrase. In each example, the extracted wh-

¹⁵ The double brackets indicate the ordinary semantic value of the sentence they contain.

expression and its correspondent have equivalent ordinary semantic values and are therefore not contrastive. The contrast-locality condition given in (94) predicts them to be ungrammatical.

A final complication is posed the following set, in which the extracted wh-expression does indeed contrast with its syntactic correspondent in the antecedent clause. These examples involve parallel extraction, and the antecedent's wh-expression has a different ordinary semantic value from the extracted wh-expression in the VPE clause. For instance, in (106), *which PUPPY* contrasts with *which KITTEN*.

- (106) ? I don't know which PUPPY you₃ should adopt, but I know which KITTEN you₃ should.
 (107) ? Some guests wondered WHAT Jan₃ would eat, and other guests wondered HOW MUCH she₃ would.
 (108) ? How many CRAWDADS did Pete₃ catch? I don't know, but I know how many LOBSTERS he₃ did.
 (109) ? I'll tell you which STUDENTS we₃ can invite, but I'm still unsure which PROFESSORS we₃ can.

My analysis predicts (106) through (109) to be grammatical. Although they are not judged by most speakers to be grammatical, they are indeed judged not to be as bad as (102) through (105). This provides support for my analysis, although it also indicates that it does not provide a complete explanation of VPE-extraction licensing.

Summarizing the current discussion, the following is a generalized licensing condition for A' - extraction out of the site of VPE, which accounts for clear patterns of grammaticality among examples of VPE extraction:

- (110) *Contrast-locality condition for VPE extraction:*
 For A' extraction out of the site of VPE to be licensed, there must be a contrastively focused expression in the C-command domain of the extracted phrase.

VI. Conclusions

Sentences (111) through (121) are examples of VPE extraction taken from the literature¹⁶. The judgments and focus indicated are those of the authors.

- (111) I know how many homeworks I've graded, but I don't know how many Bill has. (Chung et al. 1995)
 (112) * We left before they started playing party games. What did you leave before they did? (Chung et al. 1995)
 (113) I saw Abby, but Bart, I didn't. (Merchant 1999)
 (114) * They want to hire someone who speaks a Balkan language, but I don't know which they do. (Merchant 1999)
 (115) John kissed Mary, but I wonder who Harry did. (Fiengo & May 1994)
 (116) I know which book Max read, and which book Oscar didn't. (Fiengo & May 1994)

¹⁶ They are not intended as an exhaustive list.

- (117) * We wanted to invite someone, but we couldn't decide who to. (Johnson 1997)
- (118) "What VP Ellipsis Can Do, What it Can't, but not Why." (Johnson 1997)
- (119) I know which women HOLLY will discuss a report about, but I don't know which woman YOU will. (Johnson 1997)
- (120) speaker A: What was Harry able to take a picture of?
 speaker B: A Gnu.
 speaker A: * What was Tom? (Sag 1976)
- (121) * I'm going to make a candlestick. What are you? (Hardt 1999)

All but two of the above are accounted for by (110)—the contrast locality condition for VPE extraction—as long as the contrastive elements are focused. The exceptions are (120) and (121). These involve root questions, which distinguishes them from all the examples of VPE extraction considered so far. It seems to be the case that root Wh-questions cannot be formed through VPE extraction under any circumstance; the root versions of the grammatical embedded questions we have looked at are ungrammatical, and condition (110) predicts them to be good. (122) and (123) are examples.

- (122) I think YOU should ride the tallest camel. * But which one should PHIL?
- (123) No one doubts JAN will eat a sandwich when she arrives. * But what will MARGE?

I have no account of the ungrammaticality of (122) and (123).

A consequence of (110) for larger theoretical concerns should be noted. Earlier, I mentioned that ungrammatical cases of VPE extraction have been cited to show that VPE does not rescue island violations. (124), repeated from section II, involves an island violation because the extractee is linked to a position inside a relative clause.

- (124) * They want to hire someone who speaks a Balkan language, but I don't know which they do. (Merchant 1999)

(125) is a similar sentence without the island and it is also ungrammatical:

- (125) * They want to hear a lecture about a Balkan language, but I don't know which (Balkan language) they do. (Lasnik, 2000)

(110) provides an account of both cases of ungrammaticality: neither (124) nor (125) exhibits the contrastive-focus requirement. To check whether the ungrammaticality of (124) is due to its violation of condition (110) or to its island violation, we have to construct examples that adhere to condition (110) and that involve an island; (126) through (129) are such examples¹⁷:

¹⁷ Merchant 2001 provides several other examples:

- (i) *Relative clause island*:
 *Abby DOES want to hire someone who speaks GREEK, but I don't remember what kind of language she DOESN'T.
- (ii) *Left-branch* (attributive adjective case):
 *ABBY bought a big car, but I don't know how big BEN did.
- (iii) *Derived position islands* (subjects, topicalizations)

- (126) * JOHN wants to hire someone who speaks Albanian, but I don't know which Balkan language MARY does.
- (127) * John WANTS to hire someone who speaks Albanian, but I don't know which Balkan language he'll actually be ABLE to.
- (128) * I don't know whether John wants to hire someone who speaks a Balkan language, but I know which language he DOESN'T.
- (129) * I don't know whether John wants to hire someone who speaks a Balkan language, but I know which language he DOESN'T want to.

These data establish that VPE extractions which violate islands are still ungrammatical even when the condition for VPE extraction is met, suggesting that we can continue to blame the island violation for the ungrammaticality. This result shows that the contrast claimed to hold between VPE and sluicing—that VPE doesn't rescue island violations and that sluicing does—*does* in fact hold. For discussion of the interaction between sluicing and islandhood, see Merchant 1999.

On a different topic, there is one interesting generalization which should be noted, as it may lead toward an analysis quite different from the one presented here. All the ungrammatical sentences involving VPE extraction considered here can host sluicing. (130) and (131) illustrate:

- (130) * I think you should adopt one of the puppies, but I don't know WHICH one you should.
- (131) I think you should adopt one of the puppies, but I don't know which one.

And all the grammatical sentences involving VPE extraction considered here can *not* host sluicing, because there is material that follows the extracted wh-expression which is crucial to the meaning of the sentence. (132) and (133) illustrate:

- (132) I don't know which puppy you should adopt, but I know which one you SHOULDN'T.
- (133) * I don't know which puppy you should adopt, but I know which one.

These observations yield the conjecture that there is a constraint which forces the largest elision that can occur (without compromising the meaning of the sentence) once extraction from within an elided phrase is triggered.¹⁸ See Merchant 2001 for elaboration of this idea and references.¹⁹

In conclusion: my contrast-based licensing condition for VPE extraction accounts in a systematic way for previously unexplained grammaticality patterns exhibited by VPE extractions. It does so using plausible theoretical concepts that have been independently motivated, such as contrastive focus and C-command. A puzzle remains: why is any special condition for VPE extractions required at all? We would

*Abby DID said that a biography of HARPO is going to be published this year — guess which Marx brother she DIDN'T.

- (iv) *COMP-trace effects*:
*It appears to ME that SEN. HATCH will resign, but I don't know which senator it does to YOU.

¹⁸ The representation of these observations in terms of a constraint is an idea first proposed to me by Judith Aissen.

¹⁹ Merchant proposes the following constraint:

MAXELIDE: "Elide as much of an XP as possible" (when XP contains an A'-trace)

and comment that this constraint may be in part derivable from economy.

expect the facts about VPE extraction to fall out as a consequence of the interaction between VPE and A' movement generally, but nothing that I am aware of about these two phenomena predicts the VPE-extraction patterns. I anticipate that when more complete theories of ellipsis and A' movement have been developed, my analysis of VPE extraction will be reasonably integrated.

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