Journal of Linguistics (2025), **61**, 137–167
doi:10.1017/S0022226724000069

Journal of Linguistics
CAMBRIDGE UNIVERSITY PRESS

RESEARCH ARTICLE

Separability of dependents from VP in English: Beyond the argument/adjunct distinction

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Received: 20 September 2021; **Revised:** 07 March 2024; **Accepted:** 18 January 2024

Keywords: argument/adjunct distinction; syntax; VP-anaphora; VP-fronting

Abstract

This paper considers the traditional idea about English that syntactic operations targeting Verb Phrase (VP), including *do so*-anaphora, *do what*-pseudoclefting and VP-fronting, can separate adjuncts but not arguments from the VP. I argue that, in each case, the argument/adjunct distinction (A/AD) makes incorrect predictions and that the behavior of verbal dependents is more accurately explained without reference to the A/AD. With *do so*-anaphora and *do what*-pseudoclefting, I show that the behavior of a variety of Prepositional Phrase (PP) dependents is better explained by the lexical properties of the verb *do*: a PP's ability to occur with *do so*-anaphora/*do what*-pseudoclefting depends on the PP's independent compatibility with the lexical verb do. On VP-fronting, I show that apparent stranding of arguments and adjuncts poses major problems for A/AD-based analyses and suggest apparent stranding is better analyzed as extraposition. These results weaken an important motivation for the idea that adjuncts attach to a higher projection in the VP than arguments do.

1. Separability Diagnostics

It is widely believed that, for any head H, the syntactic dependents of H form two distinct classes, the *arguments* of H and the *adjuncts* to H. This Argument/Adjunct Distinction (A/AD) is associated with a wide range of empirical contrasts, called *diagnostics for argumenthood*: patterns of omissibility, iterability, islandhood, etc. are all thought to follow from the basic distinction between arguments and adjuncts (see Schütze 1995, Hedberg & DeArmond 2002, Hornstein & Nunes 2008, Needham & Toivonen 2011, Forker 2014, Toivonen 2016, Moura & Miliorini 2018, Bergs 2020, Bode 2020, Milway 2022, Zyman 2022, among others).

More precisely, argumenthood diagnostics serve as the evidence that motivates specific theoretical implementations of the A/AD in syntax, such that the empirical properties of adjuncts follow from formal aspects of the implementation. This paper focuses on one purported formal aspect of the syntactic A/AD in particular, namely, the idea that the A/AD conditions the relative configuration of a head's dependents. The core idea, originating with Lakoff & Ross

(1966),[1] is that the *arguments* of a head H occur within a smaller projection of H than the adjuncts to H do. With respect to the verbal domain specifically, I refer to this purported property of adjunction as *differential attachment-heigh of verbal dependents* (DAVD).

Example 1

(1) **Differential attachment–height of verbal dependents**
For any verb V, there is a projection ϒP within which all arguments of V and no adjuncts to V must occur.

Lakoff & Ross motivated DAVD with their now-famous '*do so*-test'. They noticed that some dependents of V, such as *tomorrow* in (2a), can occur alongside *do so*, while others, such as *onto the wagon* in (2b), cannot.

Example 2

(2) a. John took a trip last Tuesday, and I'm going to do so tomorrow
b. *John loaded a sack onto the truck, and I did so onto the wagon.

Assuming that *do so* must substitute for a complete VP, Lakoff & Ross deduced that temporal adverbials like *tomorrow* must be syntactically 'outside' the VP, while directional/goal PPs like *onto the wagon* must be syntactically 'inside' the VP. Today, the X-bar theoretic implementation of this idea remains the rough-and-ready cross-framework mainstream for argument/adjunct configuration in the VP.[2]

Example 3

(3) a. **Argument** $[_{VP}\ [_{V}$ eat$][_{NP}$ a pizza$]]$ b. **Adjunct** $[_{VP}\ [_{VP}\ [_{V}$ eat$]][_{PP}$ in the kitchen$]]$

If we identify the ϒP of (1) with VP, then patterns of stranding under *do so*-substitution support DAVD and make *do so*-substitution an effective diagnostic for argumenthood: if a verbal dependent XP can be stranded by *do so*-substitution, then it must be an adjunct; otherwise, XP must be an argument.

After Lakoff & Ross (1966), several other phenomena, including *do what*-pseudoclefting, VP-fronting and VP-ellipsis, came to be accepted as evidence for DAVD, and hence, also serve as argumenthood diagnostics, under analyses similar to that of *do so*-substitution. The central premise of all these diagnostics is that they involve an operation targeting the argument-containing ϒP of (1). Crucially, given DAVD, a ϒP-targeting operation can separate adjuncts but not arguments from V.

Example 4

(4) An operation O *separates* a dependent XP from V iff V is affected by O and XP is not

[1] Lakoff & Ross 1976 identify the idea as 'Lakoff's slogan, "Complements in, modifiers out"'.

[2] As always, there are alternatives, e.g. Larson 1988, Pesetsky 1995, Schweikert 2005, Culicover & Jackendoff 2005.

https://doi.org/10.1017/S0022226724000069 Published online by Cambridge University Press

Example 5

(5) If a phenomenon φ involves a ϒP–targeting operation, then DAVD predicts φ must be able to separate a dependent XP from V if XP is an adjunct to V and must be unable to do so if XP is an argument of V

Any phenomenon that involves a ϒP-targeting operation can function as an argumenthood diagnostic by the logic in (5). I call such diagnostics *separability diagnostics*.

Example 6

(6) A phenomenon φ is a *separability diagnostic* for argumenthood iff
   a. φ is parsimoniously analyzed as involving a ϒP–targeting operation, and
   b. the ability of φ to separate dependents from V is predicted by DAVD.

The goal of this paper is to critically reevaluate separability diagnostics as evidence for DAVD and, by extension, for the A/AD more broadly. To this end, I consider four purported separability diagnostics in English, all commonly taken to support DAVD by the logic just described:

Example 7

(7) **Separability diagnostics in English**
   a. *do so*–anaphora
   b. *do what*–pseudoclefting
   c. VP–fronting
   d. VP–ellipsis

A complete analysis of each phenomenon doing justice to the full range of individual complexities falls far outside the scope of this paper. Instead, my approach is to focus on the DAVD-relevant properties of the phenomena, identifying problems for these specific aspects of their analysis. Sections 2 through 4 below address each of *do so*-anaphora, *do what*-pseudoclefting and VP-fronting in turn. For each one, I first introduce the DAVD-relevant aspects of its analysis as a separability diagnostic, then present data challenging that analysis and finally identify an alternative A/AD-free analysis that plausibly better captures the facts. I conclude that the data, carefully analyzed, are incompatible with the assumptions in (6) and thus that these purported separability diagnostics fail to motivate DAVD as a syntactic property of the A/AD. Section 5 turns more briefly to VP-ellipsis. I identify a constellation of analytical assumptions that must align for VP-ellipsis to succeed as a separability diagnostic, which I suggest is unlikely.

It should be noted that the literature attests a variety of views regarding the precise attachment-height of adjuncts (see, e.g. Maienborn 2001, Ernst 2001, 2020). For concreteness and consistency in discussing and analyzing the data relevant for this paper, I adopt Harley's (2007, 2014) implementation of the A/AD in bare phrase structure. Harley's (1995) approach draws on the root ($\sqrt{}$) analysis of Distributed Morphology (Halle & Marantz 1993, Marantz 1997). The relevant assumption is that verbs are underlyingly roots $\sqrt{}$ in the presence of an abstract verbalizer *v* and that the arguments in a verb phrase are sisters to (a projection of) $\sqrt{}$, while adjuncts are sisters to (a projection of) *v*. The argument-containing

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ϒP of (1), then, is *v*P: arguments of the verb will be strictly internal to *v*P, while adjuncts will be external to at least some projection of *v*P.[3] Thus, in (8), which assumes that *in the kitchen* is an adjunct – and *a pizza* an argument – of the verb eat, a *v*P-targeting operation could separate *in the kitchen* from the verb, but could not separate *a pizza* from it.

Example 8

(8) $[_{vP}\ [_{vP}\ v^0\ [_{\sqrt{P}}\ [_{\sqrt{}}$ eat] $[_{NP}$ a pizza]]] $[_{PP}$ in the kitchen]]

Finally for this introduction, although the point of this paper is to engender skepticism toward DAVD as a property of the A/AD (and toward the A/AD more generally), I will assume for the sake of argument that there is a valid A/AD that separability diagnostics could in principle identify.[4] While there is no consensus on where the precise boundary between arguments and adjuncts falls, there is broad agreement on certain properties of the most clear-cut cases. For example, the most prototypical arguments must be licensed by specific verbs, while the most prototypical adjuncts are essentially self-licensing (this licensing criterion is Huddleston & Pullum's (2002: 219) 'most important property' of arguments). Meanwhile, any dependent that is non-omissible and/or L-selected[5] (in the case of PPs) is a prototypical argument. DPs are also virtually always considered arguments as a rule.[6] These relatively uncontroversial criteria will be sufficient for the purposes of this paper.

2. *Do so*-anaphora

This section demonstrates that the A/AD does not play an explanatory role in accounting for the separability of PPs from the verb in *do so*-anaphora. Przepiórkowski (1999; see also 2016) has previously argued for this same conclusion by compiling prior arguments that *do so*-anaphora resolution is a discourse-pragmatic phenomenon rather than a properly syntactic one. For example, Kehler & Ward (1999) find that *do so* can refer to material split across antecedents and that *do so*-anaphora allows certain active-passive voice mismatches. Culicover & Jackendoff (2005), Houser (2010) and Bruening (2019) also conclude that *do so*-anaphora resolution is discourse-pragmatic in nature on the basis of these facts and others.

Nevertheless, the *do so*-test remains widely accepted as a diagnostic for argumenthood. I, therefore, take a different approach here. Instead of seeking to show that *do so*-anaphora must be discourse-pragmatic in nature, I start with the assumption that *do so*-anaphora is a separability diagnostic and explore the consequences of this for the A/AD. I specifically identify three cases where the behavior of *do so*-anaphora is incommensurate with an independently motivated understanding of the A/AD. Only after establishing these problems for the DAVD-based analysis of *do so*-anaphora do I turn to the discourse-pragmatic

[3] See Borer 2014: 344–346 for a discussion of alternatives. Also, for most of this paper, the distinction between Voice and *v* (Pylkkänen 2008, Harley 2013, Legate 2014) is irrelevant. Where it is important, I will mention it explicitly.

[4] An alternative approach would be to take (a subset of) the phenomena in (7) as definitional of the A/AD.

[5] L-*selection* is Pesetsky's (1995) term for verb+preposition idiomaticity, e.g. *depend on*, *deal with*, etc.

[6] Potential exceptions include bare NP adverbials like *next time*, though such examples might well involve a null PP layer (Bresnan & Grimshaw 1978, Bešlin 2019).

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understanding, where I show that an extension of Bruening's (2019) analysis, incorporating the core idea of Miller 1990 with respect to *do so*, straightforwardly handles these problems, as well as the standard cases, without recourse to the A/AD.

2.1. *Do so*-substitution as a separability diagnostic

It is essential first to establish in exactly what way *do so*-anaphora is supposed to involve a *v*P-targeting operation, by virtue of which fact it may serve as a separability diagnostic for argumenthood. I will discuss three different views that the reader may hold on this, namely, (i) *do so* simply *is* a *v*P, (ii) *do so* seeks a semantically complete predicate as its antecedent and (iii) *do so* copies the meaning of a syntactically defined *v*P antecedent. Only the third view is valid for present purposes. I return to the second view in Section 2.3.

Consider the view that *do so*-anaphora functions as a separability diagnostic simply because it is a proform with the category *v*P. Under this view (assuming DAVD), the only dependents that will be able to occur with *do so* are adjuncts. This is essentially what is assumed by Sobin (2008) and Mikkelsen et al. (2012), among others. Unfortunately, this line of reasoning is unacceptable. The reasoning is not specific to the expression *do so*; any expression that we want to consider a *v*P can play the same role as *do so* in this argument. Suppose we transfer the reasoning to the verb *talk*: *talk* is a *v*P, and therefore any PP that can occur with *talk* must be an adjunct. We would then conclude that *to* X in 'talk to X' is an adjunct. This is fallacious: the assumption that *talk* is a *v*P (which it probably is) does not allow us to conclude that any PP occurring with *talk* must occur *outside* that *v*P. The reasoning with *do so* suffers the same problem. We can assume that *do so* is a *v*P, but that does not allow us to conclude that any PP occurring with *do so* must be an adjunct.[7]

Next, consider the idea that *do so* functions as an argumenthood diagnostic because it seeks an antecedent which is *semantically* defined to include a predicate's arguments but not necessarily its adjuncts. This paper is about DAVD, which is a syntactic-configurational property. If *do so* picks out an antecedent defined along semantic lines as just described, then it not directly relevant to DAVD.[8]

In order for *do so* to function as a separability diagnostic, it needs to take on the meaning of a *v*P-constituent antecedent. This can be accomplished in two different ways: a complete *v*P could be built up and then *replaced* by *do so* (the classic transformational analysis) or *do so* could be treated as a base-generated proform whose interpretation is identified with a *v*P-constituent antecedent. The former understanding (with a substitution transformation) can be compared to the PF-deletion approach to ellipsis and the latter to the LF-copying approach to ellipsis.[9] In the domain of ellipsis, these different perspectives are notoriously difficult to disentangle (see Merchant 2018). For the purposes of this paper, I will treat them as

[7] There may be an argument to be made that the verb *do*, denoting maximally generic events, lacks argument-structural content, so that the PPs compatible with *do so* must be adjuncts by definition. Kim et al. (2019) make an argument to this effect. However, this would be a semantic property, relevant for syntactic structure only if phenomena like *do so*-anaphora etc. show sensitivity to it.

[8] Compare what Merchant (2018) calls the 'identity question' for antecedents in ellipsis. In the present context, we need there to be a *syntactic* condition on the potential antecedents to *do so*, not a *semantic* condition.

[9] See also Houser's (2010) discussion of deep- versus surface-anaphoric approaches to *do so*.

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interchangeable but will keep to the copying approach in exposition.[10] What is essential, then, is simply that the interpretation of *do so* corresponds to that of a discourse-accessible *v*P constituent.

2.2. Behavior of different PPs under *do so*-anaphora

Do so is compatible with certain kinds of PPs, and not others. This subsection considers the behavior of several different kinds of PPs under *do so*-substitution, each of which poses problems of varying degrees for the DAVD-based approach just discussed. Specifically, the behavior of argumental *to*-phrases, benefactives, comitatives and locatives highlight misalignments between the observed data and the predictions from the A/AD.

2.2.1 *Argumental* to*-phrases*

One problem for the DAVD-based approach to *do so* comes from what I will call 'argumental *to*-phrases'.[11] (9) from Huddleston & Pullum (2002: 1533) illustrates the phenomenon. As they point out, the interpretation of *do that* in (9) is something like 'question me for over an hour before letting me go', with the *to*-phrase *to me* corresponding to the patient participant *Jill* in the antecedent clause.[12]

Example 9

(9) They questioned Jill for over an hour before letting her go: I hope they don't do that to me

Many examples of this sort with *do so* occur in corpora. Below are three from Corpus of Contemporary American English (COCA). Further examples can be found in COCA and other corpora, as well as in the literature (see, e.g. Miller 1990, Przepiórkowski 1999, Culicover & Jackendoff 2005, Mikkelsen et al. 2012).

Example 10

(10) a. It is so much more tragic when we control others through physical harm than by more passive means, and it is worst when we **do so** to our children
b. It's ok to make you both look like idiots, not so much to **do so** to your spouse alone.
c. Asian economies that previously exported predominantly to the United States, such as Japan, South Korea, and Taiwan, now **do so** to China.

In the examples above, the *to*-phrases in the *do so*-clauses correspond to argumental dependents in the antecedents. In (10a) and (10b), the *to*-phrases correspond to direct objects, which are

[10] The transformational approach to anaphora has been dispreferred since Jackendoff (1972), Hankamer & Sag (1976). For this paper, the difference is significant only in the case of benefactives, as discussed in Section 2.2.

[11] Huddleston & Pullum (2002), Culicover & Jackendoff (2005), and Mikkelsen et al. (2012) note that these *to*-phrases tend to index the patient theta role. However, the examples in (10) show a wider range of roles is available. A reviewer points out that the available range of roles suggests a malefactive understanding of these *to*-phrases.

[12] Example sentences not attributed to a corpus or prior literature were generated by the author. The judgments given are those of the author and other speakers of American English the author consulted.

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universally considered arguments (not adjuncts). In (10c) the *to*-phrase corresponds to a goal PP, also classed as an argument by standard criteria.[13] Such examples undermine *do so*-anaphora's ability to function as a separability diagnostic. As discussed above, this ability is predicated on the analysis whereby *do so* seeks a complete *v*P as its antecedent. Yet, DAVD predicts there to be no complete *v*Ps in (10) that match the meanings we find for *do so*. In (10a), for example, *do so*'s interpretation is, roughly, 'control through physical harm'. According to DAVD, there is no such *v*P in (10a); the minimal vP would be *control others*. If this *v*P is chosen as the antecedent for *do so*, an unacceptable interpretation for the *do so* clause would result, namely 'control others to our children'.

Example 11

(11) $[_{vP}\ v^0\ [_{\sqrt{P}}$ control others]]

Though Przepiórkowski (1999) argues against *do so* as evidence for the A/AD, he remarks (290–291) that data like in (10) may be insufficient to 'pronounce the demise of the *do so* test', because one could imagine an analysis whereby the problematic material covertly evacuates the antecedent *v*P[14] (see Mikkelsen et al. 2012 for a concrete solution along similar lines). However, I claim that this would not, in fact, save the *do so*-test. While Przepiórkowski's hypothetical solution could preserve both (i) DAVD and (ii) the idea that *do so* seeks a *v*P antecedent, it only does so by introducing a *uniform* treatment of arguments and adjuncts, and as such, it neutralizes *do so*'s ability to function as evidence for DAVD or the A/AD more broadly. Crucially, if we allow overlapping argumental material, like the patient *others* in (10a), to covertly evacuate the *v*P so that *do so* can target the remnant, then we allow this same analysis for adjuncts. That is, just as *do so* could target the remnant *v*P in (12a), it could also target the remnant *v*P in (12b).

Example 12

(12) a. $[_{vP}$ others $[_{vP}$ control __]] b. $[_{vP}$ tomorrow $[_{vP}$ eat __]]

↑_____| ↑_____|

This eliminates the implication from strandability to adjuncthood under *do so*-anaphora. Therefore, while the behavior of argumental *to*-phrases may not undermine the idea that *do so* seeks a syntactically defined *v*P as its antecedent, it does radically undermine the idea that *do so*-anaphora serves as a separability diagnostic for argumenthood.

2.2.2 Benefactives

A similar problem is posed by benefactives, as in (13).

[13] For example, goals occur only with verbs that license them and are often non-omissible. Some authors do consider goals adjuncts (e.g. Dowty 2000); the argumentation of this paper does not turn on the status of goals.

[14] Thus, Przepiórkowski more prominently pursues the hypothesis that *do so* is a discourse-pragmatic phenomenon as evidence against the idea that *do so* supports the A/AD.

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Example 13

(13) I'd bake Lee cookies in a heartbeat, but I'd never **do so** for Terry

I assume that DP-benefactives like *Lee* in (13) are to be considered arguments (e.g. because they are DPs and occur with specific verbs like license them). Data like (13) thus cannot be analyzed in the way necessary for *do so*-anaphora to serve as a separability diagnostic. Let us assume that double-object benefactives have a structure like either (14a) (based on Pylkkänen 2008) or (14b) (based on Bruening 2010, Bosse 2015).[15]

Example 14

(14) a. $[_{vP}\ v^0\ [_{\sqrt{P}}$ bake $[_{ApplP}$ Lee $[Appl^0$ cookies$]]]]$
b. $[_{vP}\ v^0\ [_{ApplP}$ Lee $Appl^0\ [_{\sqrt{P}}$ bake cookies$]]]]$

For *do so*-anaphora to serve as a separability diagnostic, *do so* must seek a complete *v*P as its antecedent. In both structures (14a) and (14b), the minimal *v*P is *bake Lee cookies*. However, if this *v*P were targeted as the antecedent to *do so* in (13), then the *do so* clause would receive an unacceptable interpretation, namely, 'bake Lee cookies for Terry'. The actual interpretation of *do so* in (13) is 'bake cookies in a heartbeat', including the temporal adjunct *in a heartbeat* and not including the antecedent beneficiary *Lee*.

As with argumental *to*-phrases, one could imagine an analysis that preserves both DAVD and the assumption that *do so* seeks a *v*P antecedent, by allowing the beneficiary *Lee* to covertly evacuate the antecedent *v*P. This neutralizes *do so*-anaphora's ability to serve as a separability diagnostic for the same reasons as with argumental *to*-phrases.

One could also imagine accounting for examples like (13) with a subtly different analysis of *do so*: instead of being a proform seeking a *v*P antecedent, *do so* could result from an ellipsis-like derivation, wherein a complete *v*P structure is constructed for the *do so*-clause, only to be replaced by *do so*. The relation between *do so* and its antecedent would then be similar to that between elliptical clauses and their antecedents (see Harley 2007). While this might arguably be able to account for (13) (assuming *do so*-replacement for *bake cookies in a heartbeat* would be licensed by the antecedent *bake Lee cookies in a heartbeat*), it will not work in general because of examples like (10a)/(10b). With patient *to*-phrases, no appropriate *v*P could be constructed for *do so* to replace (consider **control to our children*, for (10a), for example).

2.2.3 Locatives and comitatives

The behavior of benefactives and argumental *to*-phrases indicates that a key aspect of the DAVD-based analysis of *do so*-anaphora is incorrect; namely, these phenomena show that *do so* can have an antecedent that excludes arguments of the verb. A complementary problem is posed by locatives and comitatives, showing that there are some adjuncts that *do so* cannot

[15] These diagrams abstract away from the distinction between *v* and Voice. Making the distinction, under the high applicative analysis, one would have to identify VoiceP instead of *v*P as the argument-containing domain.

https://doi.org/10.1017/S0022226724000069 Published online by Cambridge University Press

separate from the verb. To illustrate the problem, I first distinguish locatives and comitatives that are *subject*-oriented from those that are *object*-oriented. The difference can be illustrated with (15).

Example 15

(15) a. Please don't call me at home
b. You probably shouldn't talk to him with his family.

These sentences are ambiguous. One reading of (15a) is that where the 2nd-person addressee is at home, but there is another reading where the 1st-person *speaker* is at home.[16] (15a) is similarly ambiguous; in addition to the reading where the 2nd-person addressee is with family, there is another reading where the 3rd-person referent (*him*) is the one with family.[17]

Locatives and comitatives are among the most prototypical adjuncts. It is perhaps surprising, then, to find that the object-oriented versions of these elements are incompatible with *do so*-anaphora.

Example 16

(16) a. Lee called Terry at home, and Casey **did so** at work
b. Lee talked to Terry with their family, and Casey **did so** with their friends.

On their own, the antecedent clauses in (16) would be ambiguous: 'Lee called Terry at home' could mean that Lee was at home or that Terry was, for example. But with *do so*-anaphora, the object-oriented reading goes away. (16a) can only mean that Lee called Terry while *Lee* was at work (not while *Terry* was at work), and (16b) can only mean that Lee talked to Terry while *Lee* was with their friends (not while *Terry* was with their friends). Yet, on a DAVD-based analysis of *do so*-anaphora, assuming that adjuncts attach outside the *v*P, this is unexpected.

One could maintain the idea that *do so* seeks a *v*P antecedent by taking data like (16) to indicate that the subject- versus object-oriented readings of locative/comitative PPs involve different attachment heights: the subject-oriented versions attach outside the *v*P, and the object-oriented versions attach somewhere lower (see Zhang 2007, for example, and Maienborn's 2001 analysis of external vs. internal modifiers). This would make the right predictions about (16), but it would neutralize *do so*-anaphora's ability to function as a separability diagnostic: if some adjuncts attach within the *v*P, then we cannot conclude from a dependent's non-separability from the verb under *do so*-anaphora that the dependent is an argument.

[16] In fact, there are many instances of this particular statement online from writers expressing the wish not to be contacted by their employers on their days off.

[17] These two readings can be more clearly teased apart in a video-call context. In the subject-oriented reading of the comitative, 'his family' would be making a video call with the 2nd-person addressee. In the object-oriented reading, 'his family' would be on the receiving end of the call alongside 'him'. Generally, the subject-oriented readings are the more accessible ones, but the object-oriented readings are clearly also available. See Janke & Bailey 2017 for a relevant discussion of subject- versus object-control into temporal clauses.

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2.3. An A/AD-free analysis of *do so*-anaphora

Section 2.2 presented several problems for the idea that *do so*-anaphora functions as a separability diagnostic. In this section, I suggest that an A/AD-free analysis of *do so*-anaphora better captures the data. I specifically adapt Bruening's (2019) discourse-pragmatic account of *do so*-anaphora resolution, in combination with Miller's (1990) crucial point that the dependents of *do so* are subject to the selectional restrictions of the lexical verb *do*. I first review Bruening's analysis, then introduce the crucial claim from Miller (1990), showing how this accommodates all the problems discussed in Section 2.2. As noted in Section 1, an analysis of the full range of subtleties exhibited by *do so*-anaphora falls outside the scope of this paper. Here, I focus only on the DAVD-relevant aspects of the analysis. Any adequate account of *do so*-anaphora must deal with two questions. First, how is the semantic value of *do so* determined? Second, where do the (in)compatibilities with different PPs (such as those described in Section 2.2) come from? I begin here with the first question and return to the second.

As mentioned, much prior literature demonstrates conclusively that *do so*-anaphora is fundamentally discourse-pragmatic in nature. I will not repeat the relevant arguments here; see Houser (2010) for a concise summary and Przepiórkowski (1999) for copious examples. Here, I adopt Bruening's (2019) analysis treating *do so* as a *v*P with denotation $\lambda e.f_{\langle v,\, t\rangle}(e)$. According to Bruening (2019), *do so* gets its surface semantic value simply by searching the discourse for a function *f* of the appropriate semantic type ⟨v, t⟩ (i.e. a predicate of events). The value of this function replaces that of *f* in the denotation of *do so*. In many cases, the value of *f* corresponds to the value of a *v*P node in an antecedent clause (see Bruening 2019: 31–34), but that need not be the case. With respect to split-antecedents, for example, Bruening (2019: 42) explicitly notes that the value of *f* must sometimes be 'constructed from multiple functions in the discourse'.

Though Bruening (2019) does not address them in detail, there are many restrictions on potential values for *f* (which I also cannot go into here); for example, *do so* cannot have a stative antecedent and is limited in reference to linguistic (as opposed to situationally evoked) content. See Kehler & Ward 1999, Ward & Kehler 2005 for discussions. For the purposes of this paper, I understand Bruening's (2019) required value *f* to be the maximal[18] predicate of events meeting the relevant conditions (such as those identified by Kehler & Ward (1999)) that is entailed in the discourse. This analysis then straightforwardly models the problematic examples with argumental *to*-phrases and benefactives discussed in Section 2.2, as well as all standard examples of *do so* with stranded adjuncts. To illustrate, consider (17) with an argumental *to*-phrase.

Example 17

(17) The Romans sacked Carthage before doing so to Corinth in the same year

The antecedent for *do so* here is *sack Carthage*.

[18] There must be a maximization condition on the value of *f*, ensuring that all thematic elements are included in *f* that can be. For example, *do so*'s meaning includes *loc*(e)=the-bed in (i) but not (ii). See Prüst et al. (1994) for a relevant discussion.

(i) Terry fell asleep on the bed, and Lee did so too.

(ii) Terry fell asleep on the bed, and Lee did so on the sofa.

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Example 18

(18) Antecedent denotation
λe. Sack(e) ∧ PATIENT(e)=Carthage

Do so is interpreted to mean *sack*, excluding the patient. Under a neo-Davidsonian event representation, this value is entailed from (18) via conjunction elimination.

Example 19

(19) *Do so* denotation
λe. *f*(e)
where *f* = λe. Sack(e)

Deriving the ultimate interpretation of the *do so*-clause involves combining the denotation (19) with the thematic content of the argumental *to*-phrase. Following a reviewer's suggestion, I take these *to*-phrases to contribute a malefactive theta role *mal*, leading to the denotation λe. Sack(e) ∧ *mal*(e)=Corinth for the *do so*-clause in (17). The acceptability of an example with an argumental *to*-phrase thus depends on a speaker's willingness to accept the role of the *to*-phrase's correlate as compatible with the malefactive role assigned to it in the *do so*-clause.[19]

Examples with benefactives, like (13), as well as any standard example with a stranded adjunct, work straightforwardly along the same lines. What remains unexplained (so far) under this analysis is why not just any PP can be stranded by *do so*-substitution. For example, what makes sentences like (20) unacceptable, given that apparently appropriate values for *do so* could be determined straightforwardly along the lines just described?[20]

Example 20

(20) a. *Terry looked into the cabinets, and Lee **did so** into the sink.
b. *Terry complained about Lee, and Lee **did so** about Casey.
c. *Terry died of hunger, and Lee **did so** of thirst.
d. *Terry escaped from the store, and Lee **did so** from the school.

This brings us to the second question raised at the beginning of this section, and it is here that Miller's (1990) insight is relevant. As he points out, the *do* of *do so* is a lexical verb (not an auxiliary), and as such, it can be expected to have selectional requirements,[21] like all verbs have. To take a random example, a goal *at*-phrase is incompatible with the verb *sleep* not because of any DAVD-based configurational property of goal PPs, but simply because *sleep* is not compatible with the goal theta role. Countless other verbs have the same property, and

[19] The malefactive construal will perhaps be most natural with patients. With other roles, for example, with the goal in (10c), speakers may not all agree that the malefactive construal is acceptable.

[20] For example, in (20a), λe.look(e) ∧ *goal*(e)=Lee entails λe.look(e), a possible denotation for *do so*.

[21] Miller (1990) specifically refers to *subcategorization frames* for the relevant selectional requirements. I understand the relevant property only broadly as involving a verb's semantic compatibility with different theta roles. See Lohndal 2014: 49–53 for a discussion of verb-theta role compatibility in minimalist syntax.

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the verb *do* is among them. It is selectional requirements like this that determine which kinds of PPs can occur with *do so*, not the A/AD.

We can test Miller's (1990) proposal by explicitly comparing the kinds of thematic PPs that can occur with *do so* against those that can occur with the lexical verb *do* in another context (something Miller 1990, 1992 do not do). (21) illustrates with the kinds of PPs discussed above.[22]

Example 21

(21) a. Lee did something mean to Casey
b. Lee did something nice for Casey.
c. Lee did something nice at$_{\mathbf{Loc}}$ home.
d. Lee did something nice with friends.
e. * Lee did something nice into the sink.
f. * Lee did something nice about Casey.
g. * Lee did something tragic of thirst.
h. * Lee did something nice from the school.

The PPs compatible with *do so* align closely with those compatible with lexical *do*. Notice also that the locative and comitative in (21c) and (21d) necessarily have the subject-oriented reading, just as with *do so*.[23] These data strongly support the idea that the selectional requirements of *do*, not the A/AD, determine a PP's compatibility with *do so*.

This section considered *do so*-anaphora as a potential separability diagnostic for argumenthood. While *do so*-anaphora has been widely cited as evidence for DAVD since Lakoff & Ross (1966), I presented several major misalignments between this diagnostic and the A/AD. Though these misalignments are problematic for the DAVD-based analysis of *do so*-anaphora, I showed that they are handled straightforwardly on an analysis like that of Bruening (2019), treating *do so*-anaphora as a fundamentally discourse-pragmatic phenomenon. The compatability of different types of dependents with do so can be handled in terms of the selectional properties of the verb do. In light of these facts, we should conclude that strandability under *do so*-substitution is orthogonal to the A/AD.

3. Do What-Pseudoclefting

Do so-anaphora does not provide evidence for DAVD as a property of adjunction. However, the closely related *do what*-pseudoclefting is also widely cited in support of this property and is sometimes claimed to provide more robust support than *do so*-anaphora does (see Schütze 1995, Hedberg & DeArmond 2009, Needham & Toivonen 2011, Kim et al. 2019, Zyman 2022). In this section, I show that *do what*-pseudoclefting also fails to provide evidence for DAVD as a property of adjunction. The argumentation is very similar to that of Section 2. I first introduce the DAVD-based analysis necessary for *do what*-pseudoclefting to function as a separability diagnostic. Next, I present data that is problematic for this idea. Finally, I show

[22] A reviewer finds (21e) better than (21f–h). Also, with respect to (21f), there is an idiom *do something about* which is irrelevant here.

[23] This is compatible with a structural understanding of the subject- versus object-readings of locatives/comitatives. The object-readings are unavailable with *do* simply because *do* itself lacks an object to associate with.

https://doi.org/10.1017/S0022226724000069 Published online by Cambridge University Press

that an A/AD-free analysis similar to that proposed for *do so*-anaphora better captures the data, suggesting that strandability under *do what*-pseudoclefting is unrelated to the A/AD.

3.1. *Do what*-pseudoclefting as a separability diagnostic

Do what-pseudoclefting serves as a separability diagnostic under assumptions similar to those for *do so*-anaphora discussed in Section 2.1. Recall from Section 2.1 that simply assuming *do what* to be a pro-*v*P (as Kim et al. 2019 do) is insufficient to conclude that elements it can 'strand' are adjuncts. It is also insufficient to adopt a semantic condition on pseudocleft reconstruction, because the property at issue here (i.e. DAVD) is a syntactic one.

In order for *do what*-pseudoclefting to function as a separability diagnostic, it must involve a *v*P-targeting operation. I take the relevant operation to be reconstruction along the lines of Bošković (1997). Specificational pseudoclefts[24] consist of three parts, (i) a *wh*-clause with a gap bound by a *wh*-operator, (ii) a 'counterweight' constituent that specifies the content of the gap and (iii) a copula linking these two components.

Example 22

(22) $\underbrace{\text{What Lee did}\_\_\text{yesterday}}_{wh-\text{clause}}\ \underbrace{\text{was}}_{\text{copula}}\ \underbrace{\text{buy an apple}}_{\text{counterweight}}.$

In an analysis like that of Bošković (1997), the syntactic derivation of (22) involves replacement of *what* by the counterweight at LF, for example, transforming (23a) into (23b). Reconstruction into the gap site then yields a final logical form as in (23c).

Example 23

(23) a. [$_{CP}$ What Lee did [$_{vP}$ __ yesterday]] was [$_{vP}$ buy an apple]
b. [$_{vP}$ buy an apple] Lee did [$_{vP}$ __ yesterday]
c. Lee [$_{vP}$ [$_{vP}$ bought an apple] yesterday]

See Van Luven (2018: 30) for application of Bošković's (1997) analysis to *do what*-pseudoclefts as in (23). For present purposes, what's critical is that the counterweight must be a complete *v*P, and any elements stranded at the gap site (like *yesterday* in (23)) must be able to attach outside this *v*P when it reconstructs. Compare (24a), which is predicted to be unacceptable because reconstruction to (24b) places an argument *at*-phrase outside *v*P.

Example 24

(24) a. *What Lee did at the painting was look carefully
b. Lee [$_{vP}$ [$_{vP}$ looked carefully] at the painting]

[24] Only specificational *do what*-pseudoclefts are relevant here. Predicational pseudoclefts (e.g. *What he did was terrible*) have different properties. See Den Dikken 2006 on this distinction.

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In this way, *do what*-pseudoclefting meets the definition of a separability diagnostic and could potentially provide evidence for DAVD.

3.2. Behavior of different PPs under *do what*-pseudoclefting

If *do what*-pseudoclefting is a separability diagnostic, then any PP that can be stranded under this operation should be an adjunct, and any PP that cannot be stranded should be an argument. This section presents several problems for that idea. These problems closely parallel those discussed with respect to *do so*-anaphora in Section 2 above. Therefore, for conciseness, the exposition in this section is abridged (see discussion of the parallel *do so* for more detail).

3.2.1 Argumental *to*-phrases

As with *do so*-anaphora, a *do what*-pseudocleft can host a *to*-phrase that corresponds to an argument in the counterweight. Many examples occur in corpora, and examples are also easy to construct. Here is one example from COCA and one constructed example:

Example 25

(25) a. So [what it did __ to me] was make me realize oh, anything is possible (COCA)
b. [What they did __ to the children] was chase them through the park.

The *wh*-clause in sentence (25b) is *what they did to the children*, where the *to*-phrase *to the children* that appears stranded at the gap site corresponds to an argument NP in the counterweight *v*P (i.e. the patient *them*). However, if the counterweight in (25b) reconstructs into the gap site as in (23), then an illicit *v*P would be formed, namely, *they chased them through the park to the children*. This is problematic for the idea that *do what*-pseudoclefting is a separability diagnostic.

3.2.2 Benefactives

Benefactives in *do what*-pseudoclefts pose a similar problem. Consider a sentence like (26).

Example 26

(26) [What Lee did __ for the students] was bake them cookies

The *wh*-clause here contains a benefactive PP corresponding to an indirect object benefactive *them* in the counterweight. If the counterweight *bake them cookies* were to straightforwardly reconstruct into the gap site as in (23), the result would be (27).[25]

[25] For the sake of argument, we allow vehicle change. Without this, the result is *bake them cookies for the students*.

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Example 27

(27) %Lee baked the students cookies for them

This paraphrase is acceptable for some speakers, if the *for*-phrase is interpreted as a 'deputative' benefactive (a benefactive *for*-phrase indicating that the event was carried out on someone else's behalf, in this case, on behalf of the students, see Bosse 2015: 121–122). If reconstruction yields (27), it is predicted that the *for*-phrase in the *wh*-clause in (26) is interpreted as a deputative benefactive; thus, in addition to being the *recipient* of the cake, the students in this example should also be the party *on whose behalf* the baking was carried out. That is not necessarily the case, though. The pseudocleft in (26) does not require an interpretation in which cookies were baked on behalf of the students. Instead, (26) can be interpreted as simply saying that the cookies were baked for the students to eat.[26] To the extent that *for the students* in (26) needs not be interpreted as a deputative benefactive, it is a problem for the DAVD-based understanding of *do what*-pseudoclefting.

3.2.3 Locatives and comitatives

Just as with *do so*-anaphora, benefactives and argumental *to*-phrases show that the elements apparently stranded at the gap site in *do what*-pseudoclefting do not necessarily have to correspond to adjuncts of the counterweight *v*P. Also as with *do so*-anaphora, locatives and comitatives pose a complementary problem, that is, showing that not all adjuncts can be stranded by this operation. To illustrate, consider (28).

Example 28

(28) a. [What you shouldn't do at home] is call me
b. [What you shouldn't do with his family] is talk to him.

The reconstructed versions of these sentences would be ambiguous between subject- versus object-oriented readings of the locative and comitative (compare (15) above). If object-oriented locative and comitative adjuncts could occur outside the *v*P, as DAVD would predict, we would expect the object-oriented readings to remain available under pseudoclefting. Yet, in these pseudoclefts, only the subject-oriented readings are available: (28a) can only mean that the speaker shouldn't be called when the 2nd-person addressee is at home, and (28b) can only mean that the 3rd-person referent *him* shouldn't be talked to when the 2nd-person addressee is with his family. This is problematic if *do what*-pseudoclefting is supposed to be a separability diagnostic.

[26] As a reviewer notes, although the counterweight involves a recipient benefactive theta role, the *for*-phrase in the *wh*-clause is expected to contribute a plain benefactive role (because the verb *do* does not take a recipient benefactive). The two roles happen to be compatible with the same situation here. What is essential for the present argument is that the sentence is not interpreted as involving two different benefactive roles, one a deputative benefactive and one a plain/recipient benefactive. This indicates that the recipient beneficiary of the counterweight need not be copied into the interpretation of the *wh*-clause.

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3.3. An A/AD-free analysis of *do what*-pseudoclefting

I have presented several problems (paralleling those discussed for *do so* in Section 2.2) for the idea that *do what*-pseudoclefting is a separability diagnostic. In this section, I argue that an A/AD-free understanding of *do what*-pseudoclefting better accounts for the data, contradicting the idea that *do what*-pseudoclefting provides evidence for DAVD. In brief, I adopt the analysis of Den Dikken et al. (2000), according to whom the relevant pseudoclefts have the structure of 'concealed questions'. *Do what*-pseudoclefts, therefore, do not involve reconstruction of the counterweight into the *wh*-clause, instead being interpreted in the same way as a question-answer pair. The key insight of Miller (1990) is also relevant here in the same way as with *do so*-anaphora.

Den Dikken et al.'s (2000) concealed-question analysis is necessitated by the existence of what O'Neill (2015) terms 'amalgam pseudoclefts'. In this construction, the counterweight duplicates part of the material of the *wh*-clause and is often a fully articulated clause itself. Several examples are given in (29).

Example 29

(29) a. What I'm doing is ~~I'm~~ whisking the batter
b. What we need to do is ~~we need to~~ buy groceries.
c. What I'd like to do is ~~I'd like to~~ go to the movies.

Den Dikken et al. (2000) propose that pseudoclefts of this sort comprise a topic-comment structure mediated by a Topic Phrase (TopP) projection. The *wh*-clause subject of the pseudocleft occupies Spec-TopP, and the counterweight occupies Comp-TopP.

Example 30

(30) $[_{\text{TopP}}$ [What I'd like to do] $[_{\text{Top}'}$ is [I'd like to go to the movies]]]

This structure is claimed to be present even when overlap between the *wh*-clause and the counterweight is not overt; in these cases, Den Dikken et al. (2000) (citing Ross 1997 as precedent) argue extensively that overlapping material in the counterweight is elided (see also O'Neill 2015, Van Luven 2018).

Example 31

(31) a. $[_{\text{TopP}}$ [What I'm doing] $[_{\text{Top}'}$ is [~~I'm~~ whisking the batter]]]
b. $[_{\text{TopP}}$ [What we need to do] $[_{\text{Top}'}$ is [~~we need to~~ buy groceries]]].
c. $[_{\text{TopP}}$ [What I'd like to do] $[_{\text{Top}'}$ is [~~I'd like to~~ go to the movies]]].

Den Dikken et al. (2000) propose that, rather than involving syntactic reconstruction, such sentences are interpreted in the manner of question-answer pairs like (32), which can similarly involve overlap between the question and the answer.

Example 32

(32) Q: What would you like to do
A: (I would like to) go to the movies.

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The ability of a PP to occur at the gap site in a *do what*-question like (32) is determined by the selectional properties of the lexical verb *do*. Compare (33) with (21) above.

Example 33

(33) a. What would you like to do { to Lee / for Lee / at$_{\text{Loc}}$ home / with friends }

b. *What would you like to do { at$_{\text{Goal}}$ Lee / about Lee / of thirst / from school }?

The same PPs that can occur in *do what*-questions are the ones that can appear 'stranded' at the gap site in *do what*-pseudoclefts. All the questions in (33a) make acceptable *do what*-pseudoclefts when paired with appropriate counterweights (i.e. answers), while none of the questions in (33b) do. For example, *What* I'*d like to do to Lee is surprise them*, **What* I'*d like to do at Lee is toss the ball*.

Therefore, DAVD is not needed to explain which PPs can occur with *do* in the *wh*-clause of a *do what*-pseudocleft. Instead, the ability of a PP to occur in a *do what*-pseudocleft depends on that PP's compatibility with the lexical verb *do*. This account naturally resolves all the problems discussed in Section 3.2. For example, the overlap that occurs with argumental *to*-phrases and some benefactives works by the same mechanisms as when overlap occurs in pseudoclefts or question-answer pairs generally, as in (29) or (32). As for locatives and comitatives, the reason why only the subject-oriented versions are compatible with *do what*-pseudoclefting is that the object-oriented versions are incompatible with lexical *do*, as discussed in Section 2.3.

This section considered patterns of apparent stranding under *do what*-pseudoclefting potentially providing evidence that DAVD is a property of the A/AD. I argued that this phenomenon provides no such evidence. Instead, I presented several misalignments between the A/AD and the set of PPs that appear separable from the verb under *do what*-pseudoclefting, and I argued that an analysis accurately capturing these data has no need to invoke DAVD or the A/AD more generally.

4. VP-Fronting

This section considers the phenomenon of VP-fronting as a potential motivation for DAVD as a property of the A/AD. Specifically, the idea is that a PP's ability to be stranded under VP-fronting is predictable from its argumenthood. I demonstrate that attested examples are incompatible with the A/AD-based predictions and that contemporary approaches to VP-fronting predict that the A/AD need not be involved at all. Instead, PPs are separated from the verb under VP-fronting by extraposition, applying to arguments and adjuncts equally. VP-fronting, therefore, does not provide evidence in favor of DAVD. To show this, I first discuss how VP-fronting is thought to be a separability diagnostic in Section 4.1, then report data from prior literature which pose problems for A/AD-based approaches to VP-fronting in Section 4.2 and conclude by explaining how an A/AD-free analysis could account for the stranding facts in Section 4.3.

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4.1. VP-fronting as a separability diagnostic

VP-fronting is standardly analyzed as movement of a verbal projection assumed here to be *v*P. This straightforwardly makes VP-fronting a separability diagnostic capable of motivating DAVD as a property of the A/AD. Given DAVD, the targeted *v*P will have to contain all the arguments of the verb but could potentially exclude adjuncts to the verb. Extraction of *v*P, therefore, must carry along the arguments of the verb to the landing site but could leave adjuncts behind at the extraction site.

Example 34

(34) $[_{vP}\ v^0\ [_{\sqrt{P}}\ [_{\sqrt{}}$ eat] $[_{NP}$ a pizza]]] … $[_{vP}$ __ $[_{PP}$ in the kitchen]]

↑_____|

According to this analysis of VP-fronting, any instance of Internal Merge targeting $_{\mathbf{vP}}$ represents VP-fronting, not just VP-topicalization.[27] Therefore, VP-fronting in *though*-preposing can also be considered as relevant data, as it has in prior literature (see, e.g. Phillips 2003: 77 fn. 33, Baltin 2006, 2017, Landau 2007, Janke & Neeleman 2012, Bruening 2018, Culicover & Winkler 2019, Thoms & Walkden 2019). For example, the fact that (56b) is acceptable with the same interpretation as (56a) would be taken to indicate that the durational PP *throughout the entire day* is an adjunct to *eat*.

Example 35

(35) a. Though Lee will $[_{vP}$ $[_{vP}$ eat pizza] throughout the entire day], it won't be enough
b. $[_{vP}$ Eat pizza] though Lee will $[_{vP}$ __ throughout the entire day], it won't be enough.

4.2. Behavior of different PPs under VP-fronting

This section collects judgments from a variety of sources contradicting the generalization that VP-fronting can strand adjuncts but not arguments. Judgments on VP-fronting are notoriously variable. Some speakers reject VP-fronting outright. Among those that accept it, some do not accept any stranding at all. However, in the judgments reported in the literature from speakers who do accept stranding under VP-fronting, there is little reason to believe that strandability is conditioned by the A/AD. The literature attests to many examples in

[27] Many of the examples considered in Section 4.2 do involve VP-topicalization, which always requires a licensing context in English (Phillips 2003). It is important to note that this licensing context is not the standard of evaluation used to judge well-formedness. Instead, the standard of evaluation also includes the licensing context. Thus, (i-b) is judged in comparison to (i-a), where both are placed in the same licensing context ('They said Lee would …').

(i) They said Lee would eat pizza, and …
a. Lee *will* eat pizza.
b. eat pizza Lee *will*.

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which conventional argument PPs are stranded. This includes addressee *to*-phrases, recipients, goals and certain *of*-phrases.

Example 36

(36) a. ?John said he would talk to someone, and
talk he did [$_{vP}$ __ to the first woman to walk into the room]
(Adapted from Drummond 2009: 12, ex27d)
b. He wanted to read a sonnet to someone famous,
so read a sonnet he did [$_{vP}$ __ to Salman Rushdie] (yesterday).
(Adapted from Janke & Neeleman 2012: 158, ex15b)
c. Complain though he will [$_{vP}$ __ to anyone who will listen]…
(Adapted from Bruening 2018: 382, ex43a)

Example 37

(37) a. He said he would send a telegram, and
send a telegram he did [$_{vP}$ __ to the queen on her 70th birthday]
(Adapted from Phillips 2003: 75, ex90e)
b. He said he wouldn't give money, but
give money he did [$_{vP}$ __ to politicians in secret before elections].
(Adapted from Phillips 2003: 55, ex31d)
c. I wanted to give a book to someone interesting, and
give the book I did [$_{vP}$ __ to **Mary**].
(Adapted from Janke & Neeleman 2012: 184, ex120a)

Example 38

(38) a. He said he would spill the milk, and
spill the milk he did [$_{vP}$ __ on the table at the party]
(Adapted from Phillips 2003: 74, ex85g)
b. Nail the diploma though he did [$_{vP}$ __ to the wall on the weekend] …
(Adapted from Phillips 2003: 77, fn33)
c. Dash though he may [$_{vP}$ __ into the schoolyard], it won't matter.
(Adapted from Baltin 2006: 762, ex86)

Example 39

(39) ?John said he would take pictures of someone, and
take pictures he did [$_{vP}$ __ of Bill]
(Adapted from Drummond 2009: 12, ex27e)

All these kinds of PPs would be considered arguments, not adjuncts, by standard criteria – for example, none of them has the self-licensing property that is characteristic of prototypical adjuncts (see Section 1 above). If DAVD is a property of the A/AD, these PPs should be situated within the *v*P. The *v*P in (36a), for example, would have a structure along the lines of (40).

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Example 40

(40) $[_{vP}\ v^0\ [_{\sqrt{P}}\ [_{\sqrt{}}$ talk] $[_{PP}$ to the woman]]]

With this structure, it is not possible to separate the PP from the verb simply by targeting the *v*P for Internal Merge. We could stipulate that the *to*-phrase is first dislocated to a position external to *v*P, with movement then targeting the remnant *v*P (compare Lechner 2003), but such a move would make it possible to separate anything that can be dislocated, including arguments.[28] VP-fronting would not then be expected to treat arguments differently from adjuncts and would not provide evidence for the DAVD hypothesis. I conclude that data from VP-fronting do not provide evidence for the hypothesis that adjuncts attach externally to the *v*P while arguments attach internally to the *v*P or that the A/AD otherwise plays a role in determining which PPs VP-fronting can separate from the verb.

4.3. An A/AD-free analysis of VP-fronting

Many analyses of English VP-fronting do not assume that the A/AD constrains separability. I will not attempt to adjudicate between the various options, which would require discussion of a vast literature.[29] Instead, in this subsection, I will consider one state-of-the-art analysis of English VP-fronting (that of Thoms & Walkden 2019), showing that within this analysis, the A/AD cannot parsimoniously be invoked to account for the possibilities of separation from the verb. With a minor extension, this analysis more parsimoniously accounts for the possibilities of separation *without* requiring DAVD as a property of the A/AD.

Thoms & Walkden (2019) propose that VP-fronting does not involve movement of *v*P at all but instead involves base generation of a *v*P in fronted position. The fronted *v*P is linked to the 'extraction site' via ellipsis plus operator movement. Their proposed analysis is exemplified in (41) for a sentence like *eat the pies he did*. In this example, strike-through indicates ellipsis, and angled brackets (< >) indicate an unpronounced copy created by Internal Merge.

Example 41

(41) $[_{CP2}\ Op_i\ [_{CP1}\ [_{vP\ 1}\ PRO_i$ eat the pies] $[_{TP}\ [_{DP}\ he_i$ <Op_i>] did $[_{vP}$ <DP> ~~eat the pies~~]]]]

According to Thoms & Walkden (2019), the subject of the lower *v*P is merged with an operator Op forming a complex DP. The operator, co-indexed with the subject of the lower *v*P, moves to Spec-CP, where it binds the PRO subject of the fronted *v*P (ensuring the subject of the fronted *v*P covaries with the subject of the lower *v*P). Thoms & Walkden (2019) argue that connectivity effects between the *v*P in fronted position and the lower *v*P arise through identity requirements on 'high predicate ellipsis', that is, ellipsis which applies relatively 'high' in the *v*P (they assume the relevant domain is VoiceP, a detail I omit from the notation below).

[28] This is, in fact, assumed directly by Janke & Neeleman (2012) and Culicover & Winkler (2019).

[29] For other analyses in which both arguments and adjuncts can appear to be stranded under VP-fronting, see Phillips (2003), Landau (2007), Janke & Neeleman (2012), Culicover & Winkler (2019), and Larson (2023).

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This analysis has a variety of advantages. Specifically, Thoms & Walkden (2019) show that their analysis enables an account of (i) the restricted licensing conditions on VP-fronting, (ii) the possibilities of morphological mismatch between the fronted *v*P and the elided *v*P and (iii) the restricted set of connectivity effects occurring with VP-fronting. However, Thoms & Walkden (2019) do not consider the way their proposal deals with the instances of stranding considered in this section. I argue that, according to Thoms & Walkden's (2019) proposal for VP-fronting, such examples cannot be treated as *stranding* involving the A/AD but are better treated as involving extraposition from the fronted *v*P (ignoring the A/AD).

To reach this conclusion, first consider Thoms & Walkden's (2019) critical diagnostic for high Verb Phrase Ellipsis (VPE): retorts and question tags. The reason VPE in these constructions is considered 'high' VPE is that voice mismatches are not possible.

Example 42

(42) A: John didn't penalize Molly unfairly
B: *She was TOO ~~penalized unfairly!~~
(Adapted from Den Dikken 2018: 6 ex. 21)

Example 43

(43) *We have solved the problem, hasn't it ~~been solved~~

This suggests that retorts and question tags involve ellipsis of Voice (compare Merchant 2013). Thoms & Walkden (2019), following Sailor (2014), take the target of deletion in these constructions to be (the maximal projection) VoiceP. They argue that VP-fronting involves high VPE because, for instance, the possibilities of morphological mismatch in VP-fronting mirror those in high VPE (see Thoms & Walkden 2019: Section 2.3).

High VPE does not strand dependents of the verb. According to Sailor (2014), high VPE is preferred to low VPE when the antecedent and ellipsis site are structurally equipotent, as in (44).

Example 44

(44) Jordy carefully reviewed the book, and then Kiley did
(adapted from Sailor 2014: 25, ex. 21)

Sailor (2014) notes that the interpretation of (44) preferentially includes the manner adverb *carefully*, so that the interpretation of the elliptical clause is 'carefully review the book' rather than just 'review the book (not necessarily carefully)'. Sailor (2014) thus assumes that the adverbial is contained in the minimal projection targeted by high VPE.

The idea that manner adverbs are contained within the minimal target of high VPE is supported by their behavior with retorts and question tags.

Example 45

(45) A: John won't penalize Molly unfairly
B: Yes he will!

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Example 46

(46) Jordy carefully reviewed the book, didn't he

The retort of (45) seems to necessarily include the *unfairly* part of the antecedent; it asserts that, in fact, John *will* penalize Molly unfairly. The question tag of (46) includes the *carefully* part of the matrix clause; the answer would be 'no' if Jordy had in fact reviewed the book *carelessly*. Thus, because retorts and question tags involve high VPE, (45)–(46) suggest that the domain of high VPE includes manner adverbials.

The same diagnostics can be applied to various other adjuncts to the verb, suggesting that all kinds of verbal dependents are included in the domain of high VPE. (47)–(48) illustrate with benefactives, comitatives and temporals, all typically considered adjuncts.

Example 47

(47) A: I won't buy cookies $\left\{ \begin{array}{c} \text{for you} \\ \text{with you} \\ \text{on Tuesday} \end{array} \right\}$!
B: Yes you will!

Example 48

(48) You're going to buy cookies $\left\{ \begin{array}{c} \text{for me} \\ \text{with me} \\ \text{on Tuesday} \end{array} \right\}$, aren't you?

The interpretation of the retort in (47) and the question tag in (48) necessarily includes the 'adjuncts' in their antecedents. The retort in (47), for instance, asserts that 'you will buy cookies *for me*/*with me*/*on Tuesday*'. The question in (48) would be answered 'no' if the buying didn't take place 'for me/with me/on Tuesday'. Thus, we should conclude, based on the diagnostics from Sailor (2014) and Thoms & Walkden (2019), that adjuncts of various kinds are contained in the domain of high VPE.

Because Thoms & Walkden (2019) argue that VP-fronting involves high VPE in the 'extraction site', this predicts that arguments and adjuncts cannot be stranded *in situ* by VP-fronting. That is, the arguments and adjuncts in the lower *v*P are necessarily contained in the domain of high VPE, as (47)–(48) show; they are, therefore, necessarily deleted. Thus, a representation like (49b) could not be derived for (49a) by high VPE.

Example 49

(49) a. They said Lee would win,
and win Lee did by an absolutely enormous margin
b. [$_{v\text{P}}$ win] Lee did [$_{v\text{P}}$ [$_{v\text{P}}$ ~~win~~] by an absolutely enormous margin]

Such sentences are acceptable, however, as illustrated in Section 4.2 above. How can these sentences be derived on Thoms & Walkden's (2019) analysis? The A/AD-based hypothesis that arguments are attached within the *v*P while adjuncts are attached outside it are of little help here. The domain of high VPE seems to cover arguments and adjuncts alike.

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Attachment height of arguments versus adjuncts thus can't be used to explain what can be stranded and what can't be.

I propose here that separation of dependents from the verb under VP-fronting can be derived via extraposition from the higher *v*P. That is, an instance of VP-fronting like (49a) would be analyzed as in (50). Both the fronted *v*P and the lower *v*P contain the stranded PP. High VPE deletes the PP in the lower *v*P, and the PP in the fronted *v*P is extraposed from Spec-CP.[30]

Example 50

(50) $[_{CP}\ [_{vP}$ win __] Lee did $[_{vP}$ ~~win by …~~]] $[_{PP}$ by an absolutely enormous margin]

Importantly, there is independent evidence that extraposition can take place from Spec-CP in English. Consider (51)–(52).

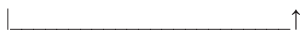
Example 51

(51) I asked $[_{CP1}$ [which book __] you bought] $[_{CP2}$ that you had seen in the library]

(Adapted from Reeve 2012: 77 fn. 19 ex. (i))

Example 52

(52) $[_{CP1}$ [How many girls __] did he invite to the party] $[_{CP2}$ that John had dated in high school]



(Adapted from Culicover & Rochemont 1990: 43 ex. 50)

In fact, the idea that dependents 'stranded' from a fronted *v*P are actually extraposed is suggested by Baltin (2017: 242). Baltin (2017) suggests specifically that the apparently stranded dependents in (53) are separated from the *v*P via extraposition.

Example 53

(53) a. Believe though I may that Fred is crazy, it doesn't matter
b. Talk to Sally though I may about Martha, it won't matter.

[30] Ott (2018: 267–268, fn21) suggests a potential alternative whereby the 'stranded' constituents are afterthoughts. This analysis predicts the fronted VP must be a complete constituent, but examples from Culicover & Winkler (2019) and Janke & Neeleman (2012) show this is not always the case. Consider (37c) or (54b), for instance.

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This analysis is supported by Culicover & Winkler's (2019) observation that constituents which can be extraposed can also be 'stranded' by VP-fronting. PP dependents of the verb, arguments and adjuncts alike, can be extraposed, explaining core examples like those in (36)–(39). It also explains why clausal complements to the verb can be stranded by VP-fronting, as illustrated in (54a). Strikingly, it additionally explains why heavy NPs can be stranded, while their light counterparts cannot be (Janke & Neeleman 2012, Culicover & Winkler 2019), as in (55): heavy but not light NPs can be extraposed.[31]

Example 54

(54) a. (…) and [$_{vP}$ *claim* __] Fritz did [$_{CP}$ that the future of the human race itself was at stake]
b. (…) and [$_{vP}$ *give* __ *to John*] she did, [$_{NP}$ a painting that she found at the art fair]. (Adapted from Culicover & Winkler 2019)

Example 55

(55) a. ?John wanted to read carefully some part of the Bible,
so [$_{vP}$ read __ carefully] he did [$_{NP}$ the entire Song of Solomon]
(Adapted from Janke & Neeleman 2012: 186 ex. 126a)
b. I was very hungry and wanted to eat.
*So [$_{vP}$ eat __] I did [$_{NP}$ the haggis].
(Adapted from Janke & Neeleman 2012: 186 ex. 124a)

With this extension (i.e. allowing extraposition from the fronted *v*P), Thoms & Walkden's (2019) analysis of VP-fronting can accommodate possibilities of separation without the DAVD hypothesis. Since both arguments and adjuncts of different kinds can be extraposed, there is no expectation that VP-fronting should be sensitive to the A/AD.

5. VP-Ellipsis and Pseudogapping

The preceding three sections of this paper considered three different phenomena commonly cited as separability diagnostics for argumenthood: *do so*-anaphora, *do what*-pseudoclefting and VP-fronting. As noted in Section 1, another phenomenon sometimes cited (e.g. by Hornstein & Nunes 2008) as evidence for a configurational distinction between arguments and adjuncts is VP-ellipsis (VPE).[32] As advocates point out, if we assume (i) DAVD and (ii) that VPE targets a *v*P constituent for either syntactic deletion or PF-non-realization (see Merchant 2018), then VPE makes a natural diagnostic for argumenthood. Ellipsis would be able to strand adjuncts to the verb but not arguments of it.

[31] Heaviness also conditions acceptability for stranding of PPs. Acceptable examples characteristically involve a lengthy or specially stressed PP, as in (36)–(39).

[32] VPE seems to be cited as a diagnostic for argumenthood less frequently than the other diagnostics discussed here.

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Example 56

(56) [$_{vP}$ ~~[$_{vP}$ v$^{\theta}$ [$_{\sqrt{P}}$ [$_{\sqrt{}}$ eat] [$_{NP}$ a pizza]]]~~] [$_{PP}$ in the kitchen]]

Under the right analysis along these lines (see below for more discussion), VPE would meet the definition assumed in this paper for separability diagnostics and could potentially provide evidence for DAVD as a property of the A/AD.

VPE is even more vast a topic, with more competing analyses and intricate confounds than the other three diagnostics considered above. The potential relation between VPE and DAVD hangs on the interaction of a variety of distinct aspects of the analysis of ellipsis, no one of which can be addressed in detail in this paper. As such, it would not be feasible for this paper to examine the DAVD-relevant aspects of VPE along the same lines as in Sections 2–4 above. The status of VPE as a separability diagnostic, therefore, cannot be settled here.

Nevertheless, I conjecture that the prospects that VPE will make a successful separability diagnostic are not promising. The reason is that, for VPE to succeed in this way, a very specific constellation of analytical stars must align, some aspects of which seem particularly unlikely. First, VPE must be a *syntactic* operation, crucially involving the derivation of a *v*P which becomes suppressed in the syntax or at spellout. If an alternative non-structural approach like that of Culicover & Jackendoff (2005) were adopted, then VPE would not make a successful separability diagnostic. Second, VPE must have the effect of silencing the *complete v*P *constituent* that it targets, such that any material stranded by ellipsis must be located outside the *v*P. In other words, we need to adopt a 'move-and-delete' approach to ellipsis remnants. If we were to adopt an approach allowing *non-constituent* deletion, then VPE would not be relevant for DAVD. Third, our analysis must distinguish the remnants of *ordinary* VPE from the remnants of *pseudogapping*. That is, constructions like (57a), where a direct object survives ellipsis, must be derived by mechanisms distinct from those by which *in five minutes* is stranded in (57b). Otherwise, argument- and adjunct-remnants alike could survive ellipsis by the same move-and-delete procedure.

Example 57

(57) a. They eat pie more often than they do pizza
b. They ate more in ten minutes than they did in five minutes.

Further, we must assume that argument-PP remnants of ellipsis result from pseudogapping, not from ordinary VPE, which is not obviously true. Levin (1979: 17) excluded PP remnants results from the pseudogapping construction on the basis of the observation that examples with PP remnants tend to have a much higher acceptability than the prototypical pseudogapping examples with NP remnants. Lasnik (1999) also develops an analysis whereby pseudogapping leaves NP remnants only. Argument and adjunct PPs alike would then have to be remnants of *ordinary* VPE, as explicitly assumed by Janke & Neeleman (2012), for example.

With the necessary analytical assumptions in place, it would have to be shown, using robust criteria for distinguishing pseudogapping from ordinary VPE (criteria which prove difficult to pin down in the first place; see Miller 2014), that argument PPs are systematically unacceptable as remnants of ordinary VPE, while adjunct PP remnants are systematically acceptable. In ordinary contexts, however, this contrast is not obvious. I do not detect a

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systematic difference in acceptability between examples like (58) and examples like (59). The former involves conventional argument PPs and the latter conventional adjunct PPs.

Example 58

(58) a. They talked more to Terry than they did to Lee
b. They took more pictures of Terry than they did of Lee.
c. They complained more loudly about Terry than they did about Lee.

Example 59

(59) a. They sang more with Terry than they did with Lee
b. They wrote more letters in print than they did in cursive.
c. They ate more politely with the spoons than they did with the forks.

Some of the necessary assumptions just described are quite plausible (see, e.-g. arguments for a structural approach to ellipsis in Van Craenenbroeck & Merchant 2013, Merchant 2018). However, others are less likely. For example, there are many challenges for the move-and-delete approach to ellipsis remnants (see, e.g. Ott & Struckmeier 2018, Broekhuis & Bayer 2020, Ott & Therrien 2020, Griffiths et al. 2023). Additionally, the necessary distinction between argument and adjunct PPs with respect to pseudogapping is not obvious, as reflected in Levin's (1979) explicit choice to exclude PP-remnants from the pseudogapping construction and as reflected in the similar status of (58)–(59).

For the purposes of this paper, I conjecture that VPE will not make a successful separability diagnostic and will not revitalize DAVD as a property of the A/AD. Concretely, this conclusion is compatible with the analysis of PP-stranding VPE put forth in Janke & Neeleman (2012) – they argue that PPs stranded by VPE attach to the VP in an 'ascending' fashion (i.e. right-adjoined to VP), with VPE targeting the full VP constituent to which the PP adjoins.

Example 60

(60) $[_{vP}\ \sout{[_{VP}\ V\ \ldots]}\ PP\ ]$

Crucially, their proposal allows for both argument and adjunct PPs to attach in this way, so that arguments and adjuncts alike can be stranded by the same VP-deletion operation. In contrast, DP arguments must attach in a 'descending' fashion (i.e. as complement to V or as specifiers of higher VP shells).

Example 61

(61) $[_{VP}\ V\ [_{VP}\ DP\ \lceil_{\overline{V}}\ V\ \ldots\ ]]$

Thus, DP-stranding VPE could not be accomplished simply by deleting a single VP constituent without prior evacuation of the DP.

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6. General Discussion

Separability diagnostics for argumenthood are predicated on DAVD, the idea that arguments systematically attach within a particular syntactic projection of the verb and that adjuncts systematically attach outside that projection. This paper examined the evidence in favor of this hypothesis, taking the relevant projection, for concreteness, to be *v*P: arguments attach within *v*P, adjuncts outside *v*P. Sections 2–4 of this paper demonstrated that *do so*-anaphora, *do what*-pseudoclefting and VP-fronting fail to provide consistent evidence in support of this hypothesis. The evidence shows that none of these phenomena is uniformly sensitive to a purported syntactic difference between argument versus adjunct PPs. Section 5 considered VP-ellipsis as further potential motivation for DAVD but suggested that the combination of analytical assumptions this requires is unlikely.

These results support the null hypothesis regarding DAVD, that is, the hypothesis that there is *no* systematic difference in attachment height between arguments and adjuncts. The two competing hypotheses can be formulated as in (62).

Example 62

(62) H_1: Knowledge of English includes DAVD
H_0: Knowledge of English does not include DAVD.

The null hypothesis H_0 is strictly more parsimonious than the alternative H_1, which involves an added stipulation which is absent from H_0. The idea that arguments and adjuncts are systematically distinguished in terms of attachment height, therefore, bears a burden of proof – it must be motivated through demonstration of empirical necessity. Traditionally, *do so*-anaphora, *do what*-pseudoclefting, VP-fronting and VP-ellipsis have been invoked as the necessary sort of motivation.

Some authors have proposed that the A/AD be reconceptualized as a ternary distinction (e.g. Hedberg & DeArmond 2009, Needham & Toivonen 2011) or as a gradient distinction (e.g. Forker 2014, Rissman et al. 2015, Kim et al. 2019). One might suspect that DAVD could be salvaged if stated as a property of one of these more sophisticated approaches. However, I maintain that the arguments of this paper apply even if we adopt a ternary or gradient A/AD. The purview of such approaches is the set of dependents for which informal intuitions of argumenthood are not always clear, like instrumental *with*-phrases and perhaps goal PPs. However, I showed above that the most prototypical arguments (e.g. patient direct objects, recipient *to*-phrases) behave counter to DAVD-based expectations. This is just as problematic for a ternary/gradient A/AD as for the conventional A/AD.

Therefore, if the conclusions of this paper are correct, and the phenomena examined above are *not*, in fact, sensitive to the A/AD, then the question arises to what extent H_1 is justified. Given that these phenomena fail to provide evidence against the null hypothesis, what reason is there to accept the idea that the A/AD is instantiated by a systematic distinction in attachment height? The full answer to this question lies beyond the scope of this paper and would involve considering in detail a range of other properties associated with the syntactic A/AD, including omission, iteration, islandhood and more. However, to the extent that separability diagnostics comprise a primary source of evidence for this particular aspect of the A/AD, the case for rejecting H_0 is substantially weakened.

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At the very least, then, the results of this paper substantially weaken the case in favor of H_1. This conclusion supports theories of clause structure which do not posit DAVD as a property of the A/AD, consistent with H_0. In fact, despite the perceived importance of the A/AD in current theory, DAVD is absent from many current approaches to clause structure. For instance, Larson (1988, 1990) argued for a VP structure such that arguments and adjuncts alike are treated as specifiers to V^0 (save for the rightmost dependent which is the 'innermost complement' to V^0). Later developments (e.g. Pesetsky 1995, Schweikert 2005, *inter alia*) have a similar property. Culicover & Jackendoff's (2005) treatment of VP also draws no configurational distinction between arguments and adjuncts; all are complements to the verb in a flat structure. The argumentation against such A/AD-*free* analyses has been sourced in part from the phenomena discussed in this paper (see Sobin's 2008 arguments against Culicover & Jackendoff's flat structure and Jackendoff's 1990 arguments against Larson's VP shells). This paper supports the A/AD-free analyses (Larson 1988, Culicover & Jackendoff 2005, etc.) by eliminating these potential counterarguments.[33]

This paper considered a particular source of evidence for the syntactic A/AD, separability diagnostics. This is only one of a number of different purported motivations for the syntactic A/AD. Other phenomena, including islandhood, iteration, extraction from weak islands, Condition C reconstruction and selection, have all been taken to motivate further properties of syntactic argumenthood. The results of this paper alone, therefore, should not be taken to cast doubt on the syntactic A/AD as a whole, since all these other properties are widely accepted as independently supporting the distinction. Nevertheless, this work contributes to a trend alongside other detailed investigations showing these additional properties also fail to provide evidence for the A/AD (e.g. Payne et al. 2013 on *one*-substitution, Miliorini 2019 on weak islands, Bruening & Al Khalaf 2019 on Condition C reconstruction, McInnerney 2023 on the adjunct island effect; and see Przepiórkowski 1999, 2016 for critique of the A/AD involving a variety of diagnostics). If this trend continues, it will become increasingly plausible that the A/AD could play a weaker role in syntax than previously assumed.

Acknowledgements. Iam grateful to three Journal of Linguistics reviewers for their detailed and constructive comments on this paper. I also thank Acrisio Pires, Ezra Keshet, Lisa Levinson, Lucy Chiang, Marlyse Baptista, Peter Culicover, Rafaela Miliorini, and Tom Ernst for helpful comments/discussion.

Competing Interests. The author has no competing interests to declare.

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[33] As for which of the existing A/AD-free analyses, if any, is most appropriate for describing the structure of VP, the results here do not directly weigh in favor of any particular option.

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Cite this article: McInnerney, Andrew. 2025. "Separability of dependents from VP in English: Beyond the argument/adjunct distinction." *Journal of Linguistics*. 61, 137–167. doi:10.1017/S0022226724000069