

## **The Eliminative Effect of Ellipsis on the Distribution of Temporal Adverbs**

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*Abstract:* The first goal of this manuscript is to argue that phrasal Temporal Adverbial Constructions (TACs) like *Al left before Pat* are derived via ellipsis from an underlying clausal source. The second goal is to demonstrate and account for the restricted distribution and interpretation of phrasal TACs relative to their clausal counterparts and TACs targeted by VP-ellipsis. The proposed analysis supports models of ellipsis licensing that allow the identification of an antecedent within the phrase structure representation of the elliptical utterance.

*Keywords.* temporal adverbs, phrase structure, ellipsis licensing, verb phrase ellipsis, stripping

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## 1 Introduction

Temporal Adverbial Constructions (TACs) introduced by the connectives *before* and *after* come in both full clausal (1a) and reduced phrasal forms (1b).

- (1) a. Al left [ before Pat left ]  
 b. Al left [ before Pat ]

A question, which is familiar from the literature on comparative constructions (see [Lechner 2004](#)), concerns the status of the phrasal TAC in (1b). One possibility is that *before* and *after* can combine directly with either clausal complements or nominal complements. A less obvious possibility is that phrasal TACs are derived from a clausal counterpart through a reduction mechanism such as ellipsis. In this scenario, the phrasal TACs above are more accurately represented as in (2).

- (2) Al left [ before Pat ~~left~~ ]

The goal of the first half of this paper is to argue that at least some phrasal TACs are derived from a clausal source. This argument is partially in response to arguments presented in [Penka & von Stechow 2011](#) against this type of approach to phrasal TACs. I show that several of the arguments in [Penka & von Stechow 2011](#) do not hold up to closer scrutiny and instead provide support for an elliptical analysis. I also present additional diagnostics that converge on the idea that phrasal TACs have an underlying clausal source.

That phrasal TACs are reduced from a clausal source has been gestured at by [Geis \(1970\)](#) and pursued by both [Larson \(1987\)](#) and [Thompson \(2005\)](#). However, I argue that these exact implementations suffer from technical shortcomings and fail to adequately account for the full range of facts regarding phrasal TACs. The facts to be presented lead us to an alternative reduction analysis for phrasal TACs that I refer to as TAC-stripping, shown in (3).

- (3)  $[_{VP} [_{VP} \text{Al left}] [_{beforeP} \text{before} [_{FOCP} \text{Pat}_I \langle [_{VP} \text{ } \text{left} \rangle ]]]]$
- 

Phrasal TACs on this account are low-adjoined on the verbal spine and contain a truncated complement to the temporal connective, roughly an extended  $\nu$ P. Their internal syntax is likened to stripping constructions as proposed by [Depiante \(2000\)](#). A single remnant can be generated by  $\bar{A}$ -movement to a focus position outside the elided  $\nu$ P. This analysis is similar in spirit to [Pancheva's \(2009\)](#) analysis of Slavic comparatives and [Weir's \(2014b\)](#) analysis of *Why*-stripping.

The second half of this paper demonstrates and accounts for a puzzle presented by the restricted distribution of phrasal TACs relative to their clausal counterparts, as well as TACs that contain a VP-ellipsis site. The empirical generalization that underlies this puzzle is stated in (4).

- (4) *No Asymmetric Embedding*

A TAC-stripping site and its antecedent must be at the same level of embedding.

This generalization captures the fact that, while TACs can generally be adjoined to various positions on the verbal spine, phrasal TACs cannot be adjoined to a predicate that does not resolve its interpretation. As will also be discussed, behavior similar to that described by (4) has been observed in other configurations, including gapping and other bare argument ellipses (Hankamer 1979, Rooth 1992b, Lechner 2004, Johnson 2019). However, I argue that available accounts for these effects in other domains do not lend themselves to a treatment of TACs.

I present an account of the generalization in (4) that treats the restricted distribution of phrasal TACs as a symptom of the inability to satisfy a focus-based licensing condition on ellipsis (Rooth 1992a). Certain phrase structure representations are blocked as a result of irreparable antecedent-containment. In other representations, the syntax-semantics of TACs as temporal relative clauses, as motivated by Geis (1970) and Larson (1990), means that the TAC-stripping site will fail to find an appropriate antecedent that contains a parallel operator-variable dependency. The particular approach to be taken will be motivated by the implausibility of stating the identity condition on TAC-stripping over a salient question meaning in the discourse (cf. AnderBois 2011, Barros 2014, Weir 2014a).

This analysis is very much like the one that Takahashi (2008) provides for under-applications of VP-ellipsis in other environments identified by Hardt & Romero (2004). However, I will argue that an account of the differing distributions of VP-ellipsis and TAC-stripping requires giving up the implementation in Takahashi (2008). I will argue that VP-ellipsis targets a constituent that is smaller than what is possible for TAC-stripping. The effect is that VP-ellipsis is able to identify antecedents that are not available to TAC-stripping. Thus, the differences between VP-ellipsis and TAC-stripping are also reduced to the ability to license ellipsis. This approach requires a rethinking of the data that motivated Takahashi's (2008) analysis. I will suggest that these may be related to failure of a TAC to address a salient question meaning in the discourse.

In section 2 I present the argument that at least some phrasal TACs are derived from a clausal source by way of ellipsis. In section 3 I present and motivate the basic syntax of the TAC-stripping operation that generates these phrasal TACs. In section 4 I present the restricted distribution of phrasal TACs relative to their clausal counterparts. In section 5 I present a slightly more articulated syntax for TACs and an account of the data from the previous section. In section 6 I demonstrate and account for the fact that TACs that have been targeted by VP-ellipsis have a slightly wider distribution than those targeted by TAC-stripping. I conclude the manuscript in section 7.

## 2 The Clausal Status of Phrasal TACs

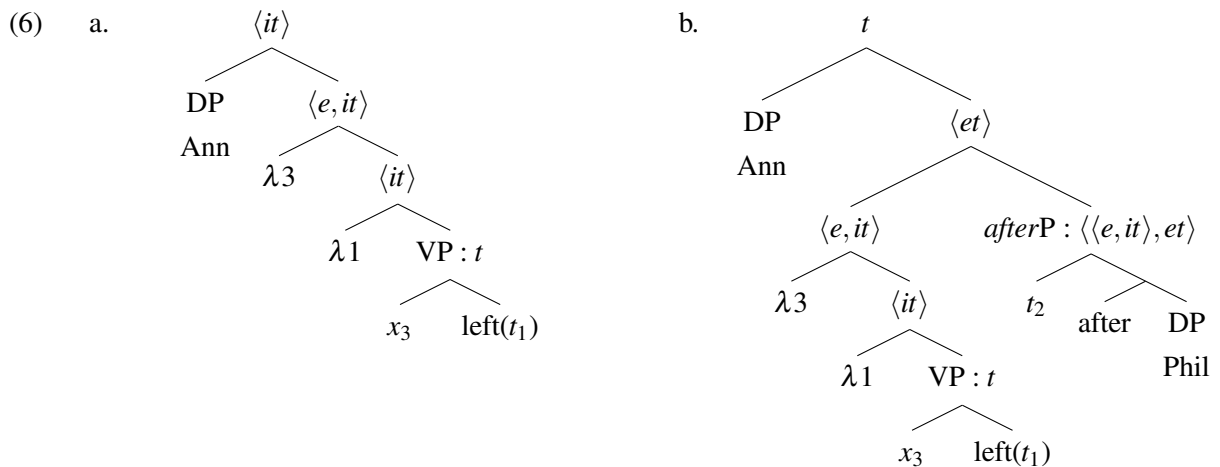
Relative to comparative constructions, discussion about the status of phrasal TACs is sparse. Nevertheless, the expected approaches are represented. One analysis asserts that the string belies the syntax. In this kind of "direct analysis," the temporal connective combines directly with a phrasal

complement. A straightforward implementation of this idea would assign phrasal TACs structures like in (5).

(5) Ann [VP left [<sub>afterP</sub> after [DP Phil ]]]

The challenge for direct analyses is to assign this representation the appropriate interpretation wherein *Phil* is also construed to have left.

Penka & von Stechow (2011) present a slightly more articulated syntax for phrasal TACs to do exactly this. Abstracting away from the precise details of the lexical semantics, which are modeled on Heim’s (Heim 1985) treatment of comparatives, they suggest that the sentence in (5) is paired with an LF representation like in (6b), where entities are variables of type  $e$ , times are of type  $i$ , and propositions are of type  $t$ .<sup>1</sup>



This representation is generated first by an application of Quantifier Raising (QR) that moves the DP *Ann* out of the VP; see (6a). The phrasal adjunct is then counter-cyclically adjoined to the verbal spine in a position below the landing site of QR, similar to what Nissenbaum 2000 proposes for clausal adjuncts with parasitic gaps. The result, shown in (6b), is the adjunction of a TAC containing a temporal variable and the nominal element *Phil*.

An alternative analysis, which suggests that the phrasal TAC is reduced from a clausal source, is pursued by both Larson (1987) and Thompson (2005). We will consider the details of these “reduced analysis” in the following sections. For the time being, it is enough to note that these authors have representations like (7) in mind.

(7) Ann left [<sub>afterP</sub> after [ Phil left ]]

The nominal element *Phil* in the representation above is the remnant of an ellipsis operation rendering the rest of the clause unspoken.

<sup>1</sup>This example is adapted from Penka & von Stechow 2011:sec.5.

The substantive difference between these two families of analyses is the amount of linguistic material proposed to be inside the TAC. Therefore, they make different predictions with respect to whether this material can be detected. Direct analyses predict that a phrasal TAC will not show evidence of additional linguistic material beyond the nominal constituent—and possibly a temporal variable—inside the TAC. Reduced analyses predict that there will be evidence of clausal linguistic material inside the TAC that shares some identity with the material of the root clause. Phrasal TACs, then, should show the basic characteristics of clauses.

Penka & von Stechow (2011) present a number of diagnostics for both English and German as evidence for the direct syntax of phrasal TACs. In the remainder of this section I will review the arguments that speak directly to the syntax of phrasal TACs in English.<sup>2</sup> Where we are able to make conclusions, I will argue that the data are consistent with or actually support a reduced analysis of phrasal TACs in English. I will also present some additional data sets that also point toward a clausal source for English phrasal TACs. Before examining the arguments from Penka & von Stechow 2011, it will be worthwhile to consider a prosodic property of phrasal TACs.

### 2.1 Focus Sensitivity

Like stripping and other bare argument ellipses, the nominal constituent in a phrasal TAC is placed in contrastive focus with a correlate in the root clause.<sup>3</sup> The pair of examples in (8) demonstrate the point with a pronominal remnant.

- (8) a. Kim met SUE before THEM.  
 b. \*Kim met SUE before 'em.

The strong pronominal *them* in (8a) serves as an acceptable remnant while the weak, unstressed *'em* in (8b) is ungrammatical.

Moreover, it was observed as early as Geis (1970) that phrasal TACs that modify a transitive predicate, like in (9) below, are ambiguous. Rooth (1992b) notes further that the placement of focus in the root clause serves to disambiguate these configurations.

- (9) a. KIM met Sue before TOM.  
       'Kim met Sue before Tom met Sue.'  
 b. Kim met SUE before TOM.  
       'Kim met Sue before Kim met Tom.'

When the root clause subject carries a pitch accent in (9a), *Tom* is interpreted as the subject of another meeting event. A pitch accent on the root clause object in (9b) indicates that *Tom* should be interpreted as the object of another meeting event.

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<sup>2</sup>Penka & von Stechow (2011) present an argument on the basis of the restricted category and number of elements inside a phrasal TAC. I will defer discussion of the latter point until footnote 13 when we have a more explicit picture of the proposed syntax of phrasal TACs.

<sup>3</sup>I will use SMALL CAPS to indicate the pitch accent associated with contrastive focus.

This observation does not rule out a direct analysis, but it is arguably expected under an analysis where *Tom* is the remnant of a clausal ellipsis operation. Assuming Rooth’s (1992b) theory of focus interpretation, focus placement in the root clause determines the set of well-formed alternatives that can be generated from the material embedded in the TAC. This is shown in (10).

- (10) a. [Root KIM met Sue ] before [Emb TOM<sub>1</sub> < ~~met Sue~~ > ]  
 $[[\text{Root}]]^f = [[\text{Emb}]]^f = \{ p : x \text{ met Sue } \mid x \in D_e \}$
- b. [Root Kim met SUE ] before [Emb < ~~Kim met~~ > TOM<sub>1</sub> ]  
 $[[\text{Root}]]^f = [[\text{Emb}]]^f = \{ p : \text{Kim met } x \mid x \in D_e \}$

When the root clause subject has a pitch accent there will be a presupposition that the the embedded clause is a member of the set of focus alternatives derived from the root clause, and vice versa. As shown in (9), this requires placing a pitch accent on *Tom* and interpreting it as the subject of the embedded clause. A similar explanation can be provided for when the root clause object has a pitch accent.

## 2.2 Binding Connectivity

Recall that direct and clausal analyses of phrasal TACs make different predictions with respect to the ability to detect unspoken linguistic material in the TAC. Building on Lechner (2004) and Bhatt & Takahashi (2011), we can probe for the existence of elided linguistic material in phrasal TACs by investigating the binding relationships of the remnant. If there is additional, unspoken linguistic material in the phrasal TAC, the remnant should be sensitive to the binding properties of that material.

Penka & von Stechow (2011) present the contrast in (11) as evidence that phrasal TACs involve directly combining the temporal connective with a DP. They point out that (11a) is acceptable on a subject interpretation of the remnant.

- (11) a. ?Mary saw Peter<sub>1</sub>’s sister [ before him<sub>1</sub> ].  
 b. \*Mary saw Peter<sub>1</sub>’s sister [ before he<sub>1</sub> saw Peter<sub>1</sub>’s sister ].

(Penka & von Stechow 2011:443, (35)–(36))

The claim is that the lack of a disjoint reference effect in (11a) indicates that the phrasal TAC does not have an underlying clausal source. If it did, the Condition C effect found in (11b) would be expected.

There is confound in this experiment that undermines the intended conclusion, however. A known property of ellipsis configurations is that they fail to display expected Condition C effects. This is one effect of what Fiengo & May (1994) refer to as Vehicle Change. Regardless of the exact source of such Vehicle Change effects, the lack of a Condition C violation in (11a) could equally signal the need for a direct analysis or a reduced analysis for this phrasal TAC.

If this is a possible interpretation of these data, we can make a second prediction. If we are

observing Vehicle Change effects in (11a), then we should expect to observe a disjoint reference effect in minimally differing examples like (12a). A subject interpretation of the remnant should induce a Condition B violations, as illustrated by (12b).

- (12) a. \*Mary praised Peter<sub>1</sub> [ before him<sub>1</sub> ].  
b. \*Mary praised Peter<sub>1</sub> [ before he<sub>1</sub> praised him<sub>1</sub> ].

These facts together support a reduction analysis of this phrasal TAC, which displays a characteristic property of ellipsis. A potential concern about the data in (12a) could be that it is the DP *Peter* in the root clause that is triggering the Condition B violation. This would undermine the conclusion that the phrasal TAC contains linguistic material. The example in (13) shows that this is not the case.

- (13) Mary<sub>2</sub> praised Peter<sub>1</sub> [ before he<sub>1</sub> praised her<sub>2</sub> ].

When the Condition B configuration in the TAC is resolved, the resulting string is grammatical. Thus, the root clause object is not responsible for the disjoint reference effects in (12).

Penka & von Stechow (2011) also provide the paradigm in (14) in support of a direct analysis for phrasal TACs.

- (14) a. \*Mary saw him<sub>1</sub> [ before Peter<sub>1</sub>'s sister ].  
b. Mary saw him<sub>1</sub> [ before Peter<sub>1</sub>'s sister saw him<sub>1</sub> ].  
c. Mary saw him<sub>1</sub> [ before Peter<sub>1</sub>'s sister did ].

(Penka & von Stechow 2011:443–444, (40)–(41))

They point out that the ungrammaticality of (14a) is not expected under a reduction analysis of phrasal TACs. If the reduced phrasal TAC had a reduced clausal structure, then it would pattern with the grammatical examples (14b) and (14c). Instead, the ungrammaticality suggests that the phrasal TAC induces a Condition C violation.

This is a judgment that neither I nor the English speaking linguists who I have consulted share. The consensus is that (14a) is grammatical. To the extent that (14a) is odd, this is intuitively an effect of the backwards anaphora that is involved, which persists across the entire paradigm. Any contrast that exists between (14a) and the other two examples is intuitively a result of the potential ambiguity regarding the grammatical role of *Peter's sister*, which is resolved in (14b) and (14c). That is, the latter two sentences only have a grammatical parse on which *Peter's sister* serves as the embedded subject. As we saw in the previous subsection, the string in (14a) theoretically permits an interpretation of *Peter's sister* as either a subject or object. This effect can be alleviated by placing a pitch accent on *Mary*.

To further demonstrate the acceptability of examples like (14a) we can consider the following ditransitive structure, which has been adapted from Bhatt & Takahashi (2011).

- (15) Jane took him<sub>1</sub> to Sue [ before Joe<sub>1</sub>'s boss took him<sub>1</sub> to Sue ].

The first thing to note about this example is that the pronominal direct object of the root clause pred-



icate does not trigger a disjoint reference effect with *Joe* in the TAC. Knowing this, it is revealing to find that the familiar subject/object ambiguity for a remnant is missing from the examples in (16). Specifically, the remnant *Joe's boss* can receive a subject interpretation, but a disjoint-reference effect disrupts an indirect object interpretation.

- (16) a. JANE took him<sub>1</sub> to Sue [ before Joe<sub>1</sub>'s BOSS  $\langle$  ~~took him<sub>1</sub> to Sue~~  $\rangle$  ]  
 b. \*Jane took him<sub>1</sub> to SUE [ before  $\langle$  ~~Jane took him<sub>1</sub> to~~  $\rangle$  Joe<sub>1</sub>'s BOSS ]

The observation that a disjoint reference effect is a function of the interpreted grammatical role of the remnant is exactly what is expected from the assertion that there is additional linguistic material inside the phrasal TAC. A trace of *Joe's boss* is c-commanded by an elided instance of the coreferential pronoun only when interpreted as the indirect object in (16b).

Importantly, we can see in (17) that an indirect object interpretation for the remnant is otherwise available.

- (17) a. JANE took Joe<sub>1</sub> to Sue [ before his<sub>1</sub> BOSS  $\langle$  ~~took him<sub>1</sub> to Sue~~  $\rangle$  ]  
 b. Jane took Joe<sub>1</sub> to SUE [ before  $\langle$  ~~Jane took him<sub>1</sub> to~~  $\rangle$  his<sub>1</sub> BOSS ]

By swapping the positions of the spoken pronoun and R-expression the relevant ambiguity emerges. Again, this is expected under a reduction analysis. The elided material in the matrix clause no longer induces a Condition C violation under either the subject or indirect object interpretation of the remnant *his boss*.

### 2.3 Quantifier Phrases

Penka & von Stechow (2011:444–445) also investigate the behavior of quantificational DPs in phrasal TACs. They argue that a quantificational DP would be expected to interact freely with quantificational elements in the root clause if a phrasal TAC had a direct syntax. This would not be possible given a reduced clausal source seeing as “quantifier scope is generally clause bounded.” A relevant test sentence, which is adapted from Penka & von Stechow (2011:445: (44)), is provided in (18).

- (18) A secretary cried after each executive.  
 a.  $\exists > \forall$ : ‘There is some secretary *x* such that, for each executive *y*, *x* cried after *y* cried.’  
 b.  $\forall > \exists$ : ‘For each executive *y*, there is some secretary *x* such that *x* cried after *y* cried.’

As indicated, this example permits both a surface-scope and inverse-scope interpretation of the quantificational DPs *a secretary* and *every student*.

One issue with this experiment relates to the stated premise that quantifier scope is clause-bounded. The consensus that has emerged from the literature seems to be that quantifier scope is generally finite-clause bounded, but non-finite clauses tend to be transparent for quantifier scope (e.g., May 1985, Larson & May 1990, Kennedy 1997). Thus, the argument in favor of a direct analysis relies on the additional unsupported premise that the clausal ellipsis site in a phrasal TAC

could only be a finite. As I will argue in the following section, there is in fact reason to believe that a phrasal TAC with a reduced clausal source contains a small clause complement.

This experiment also suffers from a confound, which is acknowledged by [Penka & von Stechow \(2011\)](#) and calls into question any conclusions regarding the status of a phrasal TAC. The example in (19) illustrates the observation credited to [Artstein \(2005\)](#) that quantificational DPs embedded in clausal TACs also interact with quantifiers in the matrix clause.

- (19) A secretary cried after each executive resigned.
- a.  $\exists > \forall$  : ‘There is some secretary  $x$  such that, for each executive  $y$ ,  $x$  cried after  $y$  resigned.’
  - b.  $\forall > \exists$  : ‘For each executive  $y$ , there is some secretary  $x$  such that  $x$  cried after  $y$  resigned.’ ([Penka & von Stechow 2011:445](#), (44))

Given the lack of contrast between the data points above, the behavior of quantifiers inside phrasal and clausal TACs does not obviously not help us choose between these analyses of English phrasal TACs.

A more telling diagnostic, however, can be found in the behavior of quantificational DPs in the root clause. Consider the difference in the available interpretations for the string in (20).

- (20) Dale read a book after May.
- a. *specific* : ‘Dale read a certain book after May read the same book’
  - b. *non-specific* : ‘Dale read a book after May read a different book.’

On the specific interpretation it is possible to interpret the TAC to mean that May read the same book that Dale read. On the non-specific interpretation, May can be understood to have read a different book than the book that Dale read. This contrast can be understood, first, by asserting that the phrasal TAC in (20) in fact has an underlying clausal source that has been reduced by ellipsis. This makes it possible to model the ambiguity by proposing different material in the ellipsis site in the way shown below:

- (21) Dale read a book ...
- a. *specific* : [<sub>afterP</sub> after [ May < ~~read it~~ > ]]
  - b. *non-specific* : [<sub>afterP</sub> after [ May < ~~read a book~~ > ]]

The specific interpretation arises as part of the Vehicle Change family of effects discussed by [Fiengo & May \(1994\)](#). More concretely, we can propose that the ellipsis site contains an E-type pronoun that can be counted as equivalent with respect to ellipsis licensing to the existentially quantified *a book* in the root clause. The non-specific interpretation arises when there is an independent instance of *a book* present in the ellipsis site ([Elliot et al. 2014](#)).

This analysis of (20) leads us to expect that the relevant ambiguity is not observed with other

types of phrasal connectives that do not involve clausal ellipsis. It is not immediately obvious, however, that this prediction is borne out. The following sentence contains a commitative *with*-PP, which has no clausal counterpart, and is compatible with either a scenario in which Dale and Mary read a single book or a scenario in which they each separately read a book.

(22) Dale read a book with Mary (\*read it/a book).

There is evidence suggesting, I believe, that this is a false-positive. Whatever the source of the vagueness in (22) is, it is arguably not a result of ellipsis.

The evidence can be drawn from the missing antecedent effects introduced by [Grinder & Postal \(1971\)](#) and employed by [Hankamer & Sag \(1976\)](#). The observation is that existential quantifiers under negation fail to introduce an antecedent for pronouns. This is demonstrated by the inability for *it* to refer to *a camel* in (23). The fact that *it* finds an antecedent given the elliptical construction in (24), is taken by [Hankamer & Sag \(1976\)](#) to support the presence of linguistic material in an ellipsis site. The reasoning is that *it* is provided an antecedent by an instance of *a camel* in the ellipsis site.

(23) \*Ivan has never ridden a camel and it stank horribly.

*it* = a camel that Ivan has ridden (adapted from [Hankamer & Sag 1976:404](#), (25))

(24) I've never ridden a camel but Ivan has  $\langle$  ridden a camel  $\rangle$  and it stank horribly.

*it* = a camel that Ivan has ridden (adapted from [Hankamer & Sag 1976:403](#), (23b))

In light of these data, consider the minimal pair of examples below. The intended antecedent for *it* is missing from the surface structure in (25), which contains a phrasal TAC. Nevertheless, the relevant specific interpretation is possible. In contrast, *it* fails to find the intended antecedent in (26), which contains a commitative *with*-PP.

(25) Dale didn't write an abstract [ after May  $\langle$  wrote an abstract  $\rangle$  ] because it was so good.

*it* = the abstract that May wrote

(26) \*Dale didn't write an abstract [ with May ] because it was so good.

*it* = the abstract that May wrote

A straightforward way to understand this contrast, which is also illustrated in these examples, is through the claim that the phrasal TAC contains elided linguistic material that provides the missing antecedent. Because the *with*-PP in (26) is not derived from a clausal source, the antecedent for *it* is missing. The result is the observed ungrammaticality.

#### 2.4 Island Effects

In addition to the claim that phrasal TACs involve ellipsis, the analysis sketched in section 1 asserted that the remnant undergoes an instance of  $\bar{A}$ -movement out of the elided constituent. To the extent that the DP contained in a phrasal TAC is sensitive to island conditions, both of these positions

would find support (e.g., Merchant 2004).

Among the relevant island conditions are the Complex-NP Constraint and the Left-Branch Condition, both catalogued by Ross (1967). The examples in (27) and (28) show respectively that the phrasal TACs are sensitive to both the Complex-NP Constraint and the Left-Branch Condition.

- (27) a. They hired someone who knows a BALKAN language  
           before they hired [DP someone [CP who knows a SLAVIC language ]]
- b. They hired someone who knows a BALKAN language  
           before [DP someone [CP who knows a SLAVIC language ]]<sub>1</sub> < ~~they hired x<sub>T</sub>~~ >
- c. \*They hired someone who knows a BALKAN language  
           before a SLAVIC language<sub>1</sub> < ~~they hired [DP someone [CP who knows x<sub>T</sub> ]]~~ >
- (28) a. Abby<sub>2</sub> read Fran's book after she<sub>2</sub> read [DP Greg's book ]
- b. Abby<sub>2</sub> read Fran's book after [DP Greg's book ] < ~~she<sub>2</sub> read x<sub>T</sub>~~ >
- c. \*Abby<sub>2</sub> read Fran's book after Greg<sub>1</sub> < ~~she<sub>2</sub> read [DP x<sub>T</sub>'s book]~~ >

The (a) variants of the examples above provide the unreduced clausal version of the TAC. The (b) variants present a phrasal TAC with remnants that contain the island environment. Note that in both cases the contrastively focused element can grammatically appear in the island. Moreover, this is possible both for clausal and phrasal TACs. The (c) variants demonstrate that the contrastively focused element cannot act as the remnant of a phrasal TAC on the intended interpretation.

These paradigms suggest that the formation of the remnant of a phrasal TAC is sensitive to island environments. This is expected under a reduction analysis along with the additional assumption that the remnant is  $\bar{A}$ -extracted from the ellipsis site.

## 2.5 Section Summary and Discussion

The data presented in this subsection collectively support the claim that phrasal TACs can be derived via ellipsis from a clausal source. The results from the previous subsection suggest, moreover, that the remnant is extracted from the elided constituent. The following section will present additional data to motivate a particular picture of the internal architecture of these phrasal TACs.

Note that the claim here is only that phrasal TACs can be reduced from a clausal source by ellipsis, not that they must be. There are examples such as (29) below, among others, that would intuitively resist such an analysis. To the extent that such examples have a clausal counterpart, that would look like (30). The content of the TAC and the root clause in that example do not fit any definition of identity that would be expected to license ellipsis.

(29) Kim left after the movie.

(30) Kim left after the movie ended.

Examples like (29) appear amenable to the kind of analysis that Penka & von Stechow (2011) pro-

pose whereby *after the movie* is a phrasal PP that provides a time variable. Alternatively, given the intuition that *the movie* is a DP with an inherent run time, it could be that the NP *movie* provides an implicit time variable, as suggested by [Champollion \(2011\)](#). As the discussion in section has hopefully demonstrated, this is not necessarily the case for all phrasal PPs.

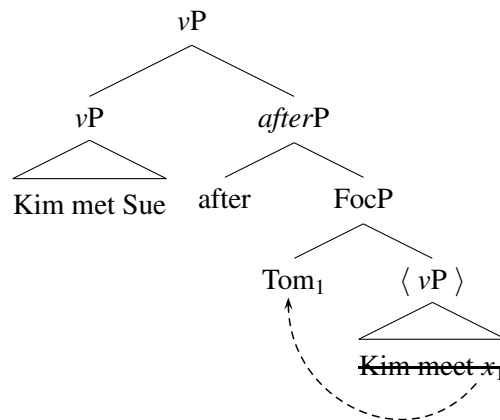
### 3 TAC-stripping

Assuming that we have correctly diagnosed at least some phrasal TACs as having a clausal source that is reduced by ellipsis, we turn to providing a syntactic analysis for them. I will first present and motivate the basic internal and external syntax of phrasal TACs targeted by ellipsis. For convenience I will refer to this particular application of ellipsis as TAC-stripping. I will then present several previous and alternative analyses along with the challenges they face.

#### 3.1 Low-adjoined Small Clauses

The basis for the analysis to be proposed here comes from the treatment of canonical stripping provided by [Depiante \(2000\)](#). The basic picture, which I am referring to as TAC-stripping, is sketched in the partial representation provided in (31).

- (31) a. Kim met Sue after Tom.  
 b.



TAC-stripping involves  $\bar{A}$ -movement of the remnant to a Focus phrase (FocP) outside of the elided constituent.<sup>4</sup> The evidence to be presented suggests that the constituent being deleted is an extended projection of the predicate, which I will identify as vP. This vP is part of a truncated complement of a necessarily low-adjoined temporal connective.<sup>5</sup>

<sup>4</sup>It is worth acknowledging that TAC-stripping, as presented here, employs movement into the left periphery of the phrasal TAC. This is prima facie at odds with Hooper & Thompson's (1973) claims about what is possible in clausal TACs. Future research will hopefully reconcile these facts by appealing to the truncation account being provided. While unreduced clausal complements to temporal connectives lack a sufficiently articulated left periphery, as argued for by [Sawada & Larson \(2004\)](#) and [Haegeman \(2006\)](#), the hypothesis is that small clause complements contain the relevant structure to allow this movement.

<sup>5</sup>[Lechner \(2004\)](#) proposes that gapping, stripping (as a type of gapping), and Right Node Raising all serve as potential

### 3.1.1 Small Clause Analysis

The reduced size of the elided constituent makes this analysis very similar to the treatment of Slavic comparatives by [Pancheva \(2009\)](#) and to the treatment of *Why*-stripping in English by [Weir \(2014b\)](#). The following examples are intended to demonstrate that the temporal connectives *before* and *after* are capable of embedding this type of constituent.

(32) You should cook the dumplings [ before eating them ].

(33) The dumplings were eaten [ after being cooked ].

An embedded main verb in (32) and the passive voice morpheme in (33) appear in their gerundive form in the absence of the progressive auxiliary *be*. This suggests an absence of the tense, modal, or aspectual structure that is normally taken to appear above the  $\nu$ P in finite clauses.

A portion of the research on gapping has suggested that those constructions at least can involve low coordination in the phrase maker, making the conjuncts relatively small constituents. Taking [Lin \(2002\)](#) and [Johnson \(2009\)](#) as representative cases, it has been argued that it is VPs or  $\nu$ Ps that are coordinated. These analyses have been motivated in part by observations from [Oehrle \(1987\)](#) and [Siegel \(1987\)](#) that sentential negation and modals scope resist being interpreted in the gapped constituent. We can observe similar behavior with phrasal TACs.

Looking at the scope of modals first, consider the example in (34).

(34) Stan can leave after Phil.

- a. = ‘Stan can leave at a time  $t$  that is after a time  $t'$  that Phil leaves at.’
- b.  $\neq$  ‘Stan can leave at a time  $t$  that is after a time  $t'$  that Phil can leave at.’

This example has an interpretation whereby Stan is able to leave after whatever time it is that Phil actually leaves at. Missing from this sentence is the interpretation expected to arise if it were possible to interpret the ellipsis site with an instance of *can*. That is, (35) is not a possible way of understanding (34).

(35) Stan can leave after Phil can leave.

This sentence is true in a scenario in which Stan can leave after the time that Phil is able to leave, independent of whether or not Phil actually leaves. This observation is expected given the assertion that the deleted constituent in a phrasal TAC is not large enough to host modal auxiliaries.

Similar effects arise with sentential negation. The TAC-stripping site in (36) resists an interpretation that would signal the presence of negation.

(36) Pam didn’t leave after Beth.

- a. = ‘Pam left, but it’s not the case that she did so after Beth left.’
- b.  $\neq$  ‘Pam left, but it’s not the case that she did so after Beth didn’t leave.’

---

reduction mechanisms for generating phrasal comparatives. I will provide a range of evidence suggesting that, in the context of TACs, only the proposed stripping operation is available.

This sentence is true in a context where Pam left but this did not happen after the time at which Beth left. Among other interpretations that are missing for the string in (36) is one that describes a situation in which Pam left and it is asserted that this did not happen before an event in which Beth did not leave. In other words, it is not possible to interpret negation inside the phrasal TAC. Note that the absence of this interpretation from a phrasal TAC does not reflect an absence of this interpretation generally. The unreduced clausal TAC below permits exactly this interpretation, though this is admittedly an odd way of expressing it.

(37) Pam didn't leave after Beth didn't leave.

The inability to interpret negation in the ellipsis site of a phrasal TAC is consistent with the claim that the elided constituent is no larger than a  $\nu$ P plus a focus projection to catch the remnant. Why this should be the case will be considered below.

### 3.1.2 Low-adjunction

The interaction of sentential negation and phrasal TACs also provides evidence that TAC-stripping only targets TACs that are adjoined relatively low to the verbal spine. In order to appreciate this, let us first observe that clausal TACs can be interpreted at various positions on the verbal spine. This is evidenced by the scopal ambiguity of *after*-phrases with respect to sentential negation, as shown in (38).

(38) Pam didn't leave after Beth left.

- a.  $\textit{afterP} > \neg$ : 'After Beth left, it's not the case that Pam left.'
- b.  $\neg > \textit{afterP}$ : 'Pam left, but it's not the case that she did so after Beth left.'

The high-scope interpretation of the TAC in (38a) could be uttered in a context where, after Beth's departure, Pam decided not to leave and instead stayed. When the TAC is interpreted within the scope of negation in (38b), the sentence could be uttered in a context where Pam left, but this in fact occurred before Beth left.<sup>6</sup>

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<sup>6</sup>It is a curious property of *before*Ps that they do not display the same type of ambiguity with respect to sentential negation that we find with *after*Ps. This is shown in (i).

- (i) Pam didn't leave before Beth left.
  - a.  $\textit{*beforeP} > \neg$ : 'Before Beth left, it's not the case that Pam left.'
  - b.  $\neg > \textit{beforeP}$ : 'Pam left, but it's not the case that she did so before Beth left.'

The precise nature of this asymmetry is likely to be orthogonal to the discussion at hand. Although, this makes *after*Ps crucial to the experiments with negation that are being run in the section.

Regardless it is possibly interesting to note that the QR-based treatment of TACs adopted below plus some naïve lexical entries for the temporal connectives (Anscombe 1964; cf. Beaver & Condoravdi 2003) may also help us understand the fact that *before* is not ambiguous with respect to negation.

- (ii) a.  $\llbracket \textit{before} \rrbracket = \lambda P \lambda Q. \forall t [P(t) \rightarrow \exists t' [Q(t') \wedge t' < t]]$   
 b.  $\llbracket \textit{after} \rrbracket = \lambda P \lambda Q. \exists t [P(t) \wedge \exists t' [Q(t') \wedge t' > t]]$

The resistance to scoping over sentential negation that *before*Ps show could be understood as an instantiation of the dispreference that universally quantified expressions have for scoping over sentential negation (e.g., Beghelli & Stowell

It is interesting in light of this general ambiguity to find that a phrasal variant of the example above, provided in (39), only has the low-scope interpretation for the TAC.

- (39) Pam didn't leave after Beth.  
 a. *\*afterP* >  $\neg$ : 'After Beth left, it's not the case that Pam left.'  
 b.  $\neg$  > *afterP*: 'Pam left, but it's not the case that she did so after Beth left.'

This sentence is only true in a context where Pam left, but she did so before Beth left (39b). It lacks the interpretation wherein it was following Beth's departure that Pam stayed (39a). The fact that the high-scope interpretation is not available suggests that phrasal TACs must be interpreted relatively low on the verbal spine.

Again, the analysis being proposed is that a species of stripping is possible in subordinated environments. This is contrary to the usual generalization about where stripping—and IP-ellipsis more generally—can be found, according to [Lobeck \(1995\)](#). As shown in (40), canonical stripping, which may preserve the remnant and a polarity item, is possible in coordinations, but not in TACs.

- (40) Kate read the article {but/\*after} not Pat.

It is possible to think about this contrast in a way that provides evidence for the analysis of TAC-stripping being assembled here.

Assume first that in stripping configurations negation does not form a constituent with the remnant, but instead has its own source in the elided constituent. Assume further that the source position of negation is outside the  $\nu$ P constituent that is able to appear in phrasal TACs. A relevant representation is provided in (41).

- (41) Kate read the article but [  $\text{not}_2$  Pat<sub>1</sub> [IP  $x_1$  y<sub>2</sub> [ $\nu$ P read the article ]]]
- 

The analysis being constructed here makes it possible to assert that there will simply not be the appropriate amount of structure to host the base-position of *not* in a phrasal TAC. Consider the representation provided in (42).

- (42) Kate read the article [*afterP* after (\*not) [<sub>FocP</sub> Pat<sub>1</sub> [ $\nu$ P ~~read the article~~ ]]]
- 

As per the argumentation in section 3.1.1, sentential negation cannot be interpreted in the elliptical material of phrasal TACs because the complement of the temporal connective is too small to include negation. Similarly, negation cannot be moved out of the phrasal TAC in (42) because the structure to generate its base-position cannot be accommodated.

What remains to be demonstrated is how a representation like (43) or its derivation is blocked.

- (43) \*Kate read the article [*afterP* after  $\text{not}_2$  [<sub>FocP</sub> Pat<sub>1</sub> [IP  $x_1$  y<sub>2</sub> [ $\nu$ P ~~read the article~~ ]]]]
- 

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1997, [Mayr & Spector 2010](#)).



In this representation the phrasal TAC contains the structure required to catch the remnant as well as a full IP. This representation would presumably provide the requisite structure to host negation, just as in canonical stripping. The question, then, is why a phrasal TAC must embed a small clause complement.

The conclusion reached above that phrasal TACs are necessarily interpreted relatively low on the verbal spine—specifically in some position lower than IP—provides part of an answer. Similar to a suggestion by Thompson (2005), the effect is that the IP node targeted for ellipsis in a phrasal TAC will necessarily be antecedent-contained. Thus, ellipsis cannot be licensed in (43). In section 5.2 we will extend this idea further to make sense of the observation that the distribution of phrasal TACs is even more restricted.<sup>7</sup>

### 3.2 Alternative Reduction Analyses

The analysis presented in the previous subsection proposed that phrasal TACs involve  $\bar{A}$ -movement of a remnant out of the elided small clause complement to a low-adjoined temporal connective. This is not the first analysis to propose that phrasal TACs are derived from a clausal source via ellipsis. We will look here at some alternatives made available in the literature with a focus on some issues they encounter and how the present proposal avoids them.

#### 3.2.1 Larson 1987

Larson (1987) suggests that phrasal TACs represented by the string in (44a) arise from a derivation that circumvents an antecedent-contained deletion (ACD) configuration.

- (44)
- a. John [ $\bar{I}$  arrived [ before Max  $\langle \bar{I} e \rangle$  ]]
  - b. [ before Max  $\langle \bar{I} e \rangle$  ]<sub>1</sub> [ John [ $\bar{I}$  arrived  $t_1$  ] ]  
↑  
----- QR -----
  - c. [ before Max  $\langle \bar{I} arrived \rangle$  ]<sub>1</sub> [ John [ $\bar{I}$  arrived  $t_1$  ] ]  
↑  
----- LF-Copying -----
- (adapted from Larson 1987:(47), 262)

The TAC is generated with an  $\bar{I}$  constituent containing an empty category, as in (44a). Assuming that TACs are adjoined VP-internally, resolving the identity of the empty category requires the application of Quantifier Raising (QR) shown in (44b). This places the TAC in a position outside of its containing  $\bar{I}$ . In this position, the ellipsis site can be resolved through LF-copying of the root  $\bar{I}$ -constituent into the TAC; see (44c).

The first issue to observe with this analysis is that the ellipsis resolution process targets a  $\bar{I}$  node, a non-phrasal constituent. This runs counter to the modern consensus that ellipsis deals in phrasal

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<sup>7</sup>There remains the question why phrasal TACs must be adjoined in the low positions in which we find them. This is not something that the analysis presented here or below obviously provides an answer to. Providing an understanding of this property of TAC-stripping and phrasal TACs must be left for future research.

constituents. The analysis of TAC-stripping that was proposed above asserts ellipsis of a phrasal constituent.

The second issue concerns whether movement of the TAC here actually resolves the supposed antecedent-containment problem. This is similar to a point made by [Larson & May \(1990\)](#) in response to the analysis of relative clause ACD configurations proposed by [Baltin \(1987\)](#). Examining the representation in (44c) we find that movement of the TAC leaves behind a trace in the root  $\bar{I}$  constituent that is not matched by a similar variable in the proposed ellipsis site. The ellipsis site and its antecedent, therefore, do not satisfy the usual identity constraints that licenses ellipsis.

Suppose, then, that the root  $\bar{I}$  constituent is faithfully copied over. This will produce the LF representation in (45), to be contrasted with (44c).

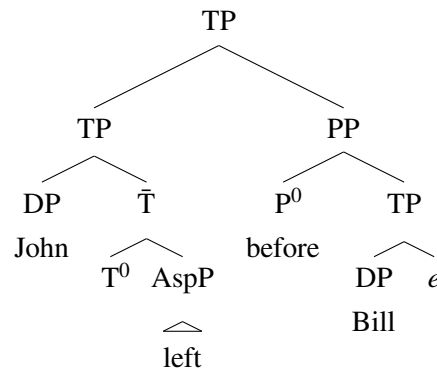
(45) [ before Max  $\langle \bar{I} \text{ arrived } t_1 \rangle ]_1$  [ John  $[\bar{I} \text{ arrived } t_1]$  ]

This does not solve the issue, however. In (45), the elliptical  $\bar{I}$  constituent contains an unbound movement trace. At best, this trace might be interpretable as a free variable. However, it seems to be a constraint on ellipsis that variables in the ellipsis and antecedent sites must be bound from parallel positions or otherwise co-referent in the case that both are free (e.g., [Sag 1976](#)). Because neither of these conditions are met in (45), it is not expected that ellipsis will be licensed in this representation.<sup>8</sup>

### 3.2.2 Thompson 2005

[Thompson \(2005\)](#) proposes an analysis of phrasal TACs that avoids the issue of variables. For her, ellipsis resolution involves LF-Copying, but the TAC is base-generated as an adjunct to TP.

(46) a. John left before Bill *e*  
 b.



(adapted from [Thompson 2005:77](#), (45))

<sup>8</sup>An alternative for dealing with (44c) could be to assert that movement of the TAC does not leave behind a trace. [Baltin \(1987\)](#) argues that this is an option when relative clauses are moved to avoid ACD configurations. We will see in the remainder of the manuscript that there is significant explanatory power in asserting that TACs undergo QR and do leave traces.

Thompson (2005:77) suggests that the ellipsis site is resolved by “copying (the lower segment of) TP into the ellipsis site.” Copying the lower segment of the TP generates the representation in (47).

(47) John left [<sub>PP</sub> before [<sub>TP</sub> Bill [<sub>TP</sub> John left ]]]

It is not clear that this would be a legitimate representation or that it should generate the intended interpretation, which is that John left and this happened before Bill left. It seems that on this analysis it must be asserted instead that the root  $\bar{T}$  must be copied into the ellipsis site. Like Larson (1987), this analysis must assume ellipsis of a non-phrasal constituent and, for this reason, should be dispreferred to the analysis of TAC-stripping being presented.

A significant issue for both the analysis in Thompson 2005 and the analysis in Larson 1987 comes from the observation in section 2.1 that the remnant of a phrasal TAC may be ambiguous given a transitive predicate. The example from (9) is provided again in (48).

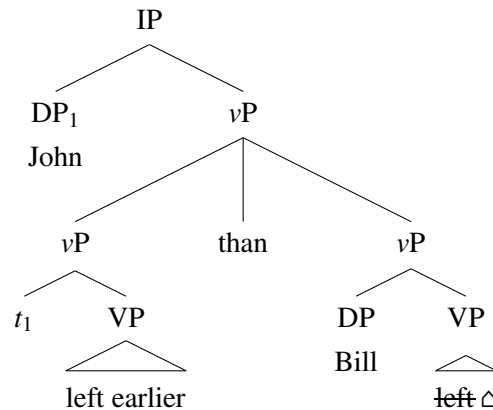
- (48) a. KIM met Sue before TOM.  
‘Kim met Sue before Tom met Sue.’  
b. Kim met SUE before TOM.  
‘Kim met Sue before Kim met Tom.’

This ambiguity is not expected if truncated TACs are derived only by ellipsis of an  $\bar{I}$ -constituent as proposed by Larson (1987) or a  $\bar{T}$ -constituent as required for Thompson (2005). No material other than what appears in the grammatical subject position or higher would be expected to survive ellipsis. However, this is an expected property in the analysis of phrasal TACs presented above. The interpreted grammatical role of the remnant is a consequence of its base-generated position within the elided clausal material.

### 3.2.3 *Conjunction Reduction*

The analysis presented in Larson (1987) is motivated in part by the idea that it is possible to think of TACs as counterparts to comparatives like *earlier* and *later*. This can in fact be traced as far back as Geis (1970:ch.4), who noted a number of syntactic and interpretive similarities between these constructions. An alternative implementation of this idea could build from Lechner (2004), who argues that phrasal comparatives have a clausal source and are derived coordination configurations, as in (49).

(49)



The argumentation that [Lechner \(2004\)](#) provides for this derived conjunction analysis is the conclusion that comparative constructions can be targeted by across-the-board movement, gapping, stripping as a form of gapping, and right node raising. The reasoning is that these reduction processes only target conjunctions, therefore, comparative constructions at least can be conjunctions at a point in the derivation when these mechanisms apply.

This approach to phrasal TACs would reject the claim that they involve subordination configurations. Instead, they would similarly be treated as (derived) coordinations that are possibly reduced via gapping, right node raising, or across-the-board movement. As we will see presently, there are considerations that speak against this type of approach. TACs cannot be targeted by the full range of reduction mechanisms available to comparatives, they fail to display properties expected of coordinations, and the temporal connectives *before* and *after* show non-characteristic properties of comparatives.

Concerning the reduction mechanisms, it has been argued that across-the-board movement and right node raising do not exclusively appear in coordination configurations (see, for instance, the literature on parasitic gaps; [Munn 1992](#), [Postal 1993, 1994](#), [Nunes 2004](#)). On the other hand, gapping has relatively uncontroversially been assumed to be impossible outside coordinations ([Jackendoff 1971](#), [Hankamer 1979](#)). Therefore, the availability of gapping seems to be the strongest argument for a coordination treatment of comparatives and potentially for TACs. However, as pointed out by [Lobeck \(1995\)](#) and [Penka & von Stechow \(2011\)](#), only a single remnant is possible within the TAC. A relevant paradigm is provided in (50).

- (50) a. Kim read the article and Sam ~~read~~ the book.  
b. Kim read the the article earlier than Sam ~~read~~ the book.  
c. \*Kim read the article before Sam ~~read~~ the book.

This paradigm can be taken to teach us two things. The first is that TACs do not tolerate gapping, unlike coordinations and comparatives. Second, following [Lechner's \(2004\)](#) reasoning, the failure for gapping to target TACs can be interpreted as evidence that TACs should not be treated on par with either coordination or comparative configurations.

Additional facts speak against equating TACs and coordinations, including their differing ability to appear clause-initially in (51).

- (51) a. \*And he read the magazine, Tim read the book.  
b. After he read the magazine, Tim read the book.

To the extent that phrasal TACs require treatment as coordinations, the expectation is that they, too, should resist appearing clause-initially. Instead, we find that phrasal TACs can appear clause-initially. This is shown in (52), which suggests that phrasal TACs are not coordinations.

- (52) After the magazine, Tim read the book.

Moreover, if phrasal TACs required treatment as coordination, we would expect that it is not possible to extract from only the first conjunct. Assuming that the moved element does not come to bind a variable in the second conjunct, the result demonstrated by the clausal examples in (53) would be a violation of the Coordinate Structure Constraint (Ross 1967, Ruys 1992).

- (53) a. \*I know what<sub>1</sub> Kim read  $x_1$  and she read the magazine.  
b. I know what<sub>1</sub> Kim read  $x_1$  after she read the magazine.

This expectation is not borne out. The sentence in (54) shows that phrasal TACs behave like subordination structures with respect to extraction.

- (54) I know what<sub>1</sub> Kim read  $x_1$  after the magazine.

Despite their actual and intuitive similarities, there is also reason to think that *before* and *after* are not counterparts to the comparatives *earlier* and *later*. For example, a seemingly ubiquitous property of comparatives is their ability to license negative polarity items (NPIs), like *anyone* in (55). However, it has been known at least since Geis 1970 that, while *before* licenses NPIs, *after* does not. The contrast is shown in (56) for both clausal and phrasal variants.

- (55) a. Meg left later than anyone else (left).  
b. Bob ate earlier than anyone else (ate).

- (56) a. \*Meg left after anyone else (left).  
b. Bob ate before anyone else (ate).

To this we can add the asymmetry between *after* and *before* with respect to their scope relative sentential negation. Section 3.1.2 demonstrated that clausal *after*Ps may be interpreted either above or below sentential negation. It was observed in footnote 6, however, that clausal *before*Ps strongly resist being interpreted above sentential negation.

Finally, Geis (1970:143–146) observes what he refers to as the Verb-Verb Constraint, which describes the dispreference for mismatched verbs in the comparative and root clauses in (57).

- (57) a. ??Joe left later than he ate.  
b. ??Joe left earlier than he ate.

No account is provided for this constraint. Although my intuition, and that of several linguists and non-linguists, is that (58) can be improved by placing a pitch accent on the verbs. This may be taken to suggest that (57) is a case of comparative subdeletion. Regardless, the relevant observation is that no such oddity arises in the TACs in (58). The verb of the root clause and TAC can mismatch without any particular prosodic licensing.

- (58) a. Joe left after he ate.  
b. Joe left before he ate.

In sum, both clausal and phrasal TACs display properties indicating that they are syntactically distinct from more usual instances of comparatives and coordinations. These conclusions will guide the remainder of the paper as we attempt to account for the distribution of phrasal TACs under the analysis of TAC-stripping presented in this section.

#### 4 The Eliminative Puzzle of TAC-stripping

In this section we turn to constraints on the distribution of phrasal TACs. As we will see, phrasal TACs have a restricted distribution that can be described by the constraint in (4), repeated in (59).

(59) *No Asymmetric Embedding*

A TAC-stripping site and its antecedent must be at the same level of embedding.

This constraint encompasses the idea that, given an analysis of TAC-stripping, the interpretation of a phrasal TAC cannot be resolved to any other predicate than the one it modifies. The next two subsections will establish this empirical generalization. The third subsection acknowledges the resemblance this constraint shares with observations made in the literature regarding gapping and various Bare Argument Ellipses. I will argue that available approaches for those constructions are not suited for TACs, given their resistance to being treated as coordinations.

##### 4.1 *The Distribution of Clausal Temporal Adverbs*

As is commonly thought to be the case for other adjuncts, utterance-final clausal TACs may be ambiguous with respect to their point of adjunction on the clausal spine in multi-clausal constructions. The string in (60) provides a relevant example.

- (60) Kim heard that Sue left after Joe left.

On one bracketing of the string in (60), the TAC *after Joe left* is a constituent of the embedded clause. This constituency generates an interpretation whereby the TAC modifies the event of Joe leaving. This is shown in (61), which we will refer to as the *embedded interpretation*.

- (61) *Embedded interpretation*  
 Kim heard [<sub>CP</sub> that Sue left after Joe left ]  
 ‘Kim heard that, after Joe left, Sue left.’

On an alternative bracketing, the TAC is a constituent of the embedding clause. The interpretation is one where the TAC modifies the event of Kim hearing about the fact regarding Sue, as shown by (62). We will refer to this as the *matrix interpretation*.

- (62) *Matrix interpretation*  
 Kim heard [<sub>CP</sub> that Sue left ] after Joe left.  
 ‘After Joe left, Kim heard that Sue left.’

That these interpretations indeed correspond to the proposed bracketings is supported by basic constituency diagnostics. Replacing the embedded clause with a proform would presumably remove the structure that hosts the clausal TAC and the embedded interpretation should become unavailable. This expectation is realized in the following example.

- (63) Kim heard it after Joe left.  
 ≠ ‘Kim heard that, after Joe left, Sue left.’  
 = ‘After Joe left, Kim heard that Sue left.’

A structural account of the observed ambiguity also predicts a correlation between the interpretation of the TAC and bound-variable interpretations of pronouns inside the TAC. The matrix reading of the TAC should not permit a variable in the TAC to be bound by the embedded subject on account of being interpreted outside the scope of the embedded subject. The example in (64) is provided to show that this prediction is borne out.

- (64) Kim heard that no one<sub>1</sub> left after his<sub>1</sub> boss left.  
 a. = ‘Kim heard that, for no person  $x$ , after  $x$ ’s boss left,  $x$  left.’  
 b. ≠ ‘After  $x$ ’s boss left, Kim heard that, for no person  $x$ ,  $x$  left.’

We are also led to the expectation on this account that either reading will be available if it is the matrix subject that binds a pronoun in the TAC. The example in (65) is provided to show that this prediction is borne out.

- (65) No one<sub>1</sub> heard that Kim left after his<sub>1</sub> boss left.  
 a. = ‘For no person  $x$ ,  $x$  heard that, after  $x$ ’s boss left, Kim left.’  
 b. = ‘For no person  $x$ , after  $x$ ’s boss left,  $x$  heard that Kim left.’

These observations support the unsurprising conclusion that the height of adjunction of a TAC determines its modification relationship.

#### 4.2 *The Distribution of Phrasal Temporal Adverbs*

We have already seen one way in which the distribution of phrasal TACs differs from their clausal counterparts in section 3.1.2 along with a way of understanding that contrast. We will see here that the non-overlapping distribution of clausal and phrasal TACs is even more general.

The previous subsection considered strings like in (66a), observing that the clausal TAC is ambiguous with respect to its point of adjunction on the verbal spine. The string in (66b) differs minimally in that it now contains a phrasal TAC.

- (66) a. Kim heard that Sue left after Joe left.  
b. Kim heard that Sue left after Joe.

The string in (66b) is not ambiguous in the same way as its counterpart in (66a). The phrasal TAC can be paired with the embedded interpretation, which we expect to arise from the bracketing in (67) along with the application TAC-stripping that is illustrated.

- (67) Kim heard [ (that) Sue left after Joe < left > ]  
= 'Kim heard that, after Joe left, Sue left.'

Missing from this string, however, is the matrix-level interpretation that is illustrated in (68).

- (68) \*Kim heard [ (that) Sue left ] after Joe < left >.  
≠ 'After Joe left, Kim heard that Sue left.'

This is not to say that a phrasal TAC must adjoin to an embedded position or that TAC-stripping cannot target an embedded TAC. As shown in (69), matrix-level modification of a phrasal TAC is possible when the meaning of the TAC-stripping is resolved to the matrix predicate.

- (69) Kim heard [ (that) Sue left ] after Joe < ~~heard that Sue left~~ >.  
= 'After Joe heard that Sue left, Kim heard that Sue left.'

The contrast between the examples in (68) and (69) is rather telling. It seems to suggest that a matrix-adjoined TAC can be targeted for TAC-stripping, but the TAC-stripping site is necessarily resolved to the clause that it modifies. It is possible to provide a similar description of the contrast between (67) above and the example in (70) below.

- (70) \*Kim heard [ (that) Sue left after Joe < ~~heard that Sue left~~ > ].  
≠ 'Kim heard that, after Joe heard that Sue left, Sue left.'

The intended interpretation of this string, which is unavailable, is one in which the TAC modifies the embedded predicate but the TAC-stripping site is resolved to the matrix predicate.

That this is the correct description of the facts is corroborated by the example in (71).

- (71) Kim heard [ (that) Sue left after Joe heard that Sue left ].  
= 'Kim heard that, after Joe heard that Sue left, Sue left.'

This string provides the clausal variant of the example in (70) and is grammatical on the intended



interpretation. This suggests that it is not the bracketing itself that results in the ungrammaticality observed in (70). Instead, it is the phrasal TAC—and presumably the particular application of TAC-stripping—that is disallowed under this bracketing.

#### 4.3 Section Summary and Discussion

The discussion in the previous two subsections is summarized by Table 1, which shows the available interpretation of a TAC-stripping site as a function of the point of adjunction of the phrasal TAC.

	<i>antecedent</i>		<i>TAC-stripping</i>
<i>adjunction</i>	matrix	matrix	✓ (69)
	matrix	embedded	* (68)
	embedded	matrix	* (70)
	embedded	embedded	✓ (67)

Table 1: Possible source of antecedent for TAC-stripping as a function of adjunction site.

A way to understand these facts is that the ellipsis site in a phrasal TAC is necessarily resolved to the *vP* that it directly modifies.

This behavior is reminiscent in certain ways to effects observed for gapping and stripping. It has been known since [Hankamer 1979](#) that the antecedent for gapping resists being embedded relative to the gapped site.<sup>9</sup> The following example is adapted from [Johnson 2009](#).

(72) \*She’s said [ Peter has eaten his peas ] and Sally ~~ate~~ her green beans.  
([Johnson 2009:300](#), (29a))

The following example, which has been adapted from [Lobeck 1995](#), demonstrates the same for stripping.

(73) \*Geoff said [ that Jane likes to study rocks ], and ~~Jane likes to study~~ geography too.  
([Lobeck 1995:27](#), (68))

The exact nature of this restriction on gapping and stripping is not entirely clear at this point.<sup>10</sup> [Johnson \(2009\)](#) proposes that an inability to embed the antecedent of gapping is a property one

<sup>9</sup>It is possibly tempting to also analogize the data investigated in this section with the familiar constraints against embedding a gapping or stripping site under another predicate ([Hankamer 1979](#), [Lobeck 1995](#), [Johnson 2019](#)), which have been counter-exemplified by [Weir \(2014a\)](#) and [Wurmbrand \(2017\)](#). A relevant example is adapted again from [Johnson 2009](#).

(i) \*Some had eaten mussels and [ she claims [ that others shrimp ]].  
([Johnson 2009:293](#), (15b))

The puzzle being presented here is slightly different. We are interested in the inability to embed a phrasal TAC inside the predicate that resolves its meaning.

<sup>10</sup>The claim that gapping and stripping cannot find an embedded antecedent in English has been counter-exemplified by [Toosarvandani \(2016\)](#) and [Lobeck \(1995\)](#), respectively.

would expect if gapping involved coordination of vPs and across-the-board (ATB) extraction of VPs, a proposal given slightly more substance in [Johnson 2019](#). In a response to [Johnson \(2009\)](#), [Toosarvandani \(2016\)](#) proposes that a requirement for conjoined vPs to have parallel focus structures is the source of gapping’s apparent inability to identify an antecedent in an embedded clause.

Setting the precise details of these proposals aside, neither of them is suited to be applied to constraints on TACs. Recall from section 3.2.3 that neither clausal nor phrasal TACs are amenable to treatment as coordination structures. Thus, any constraint on conjoined vPs will not be applicable. Additionally, [Postal \(1993\)](#) catalogs a significant amount of evidence that ATB extraction is not possible in subordination structures and, moreover, that only nominal constituents can license parasitic gaps such structures. These observations, if correct, preclude an analysis of phrasal TACs that employs VP extraction, ATB or otherwise.

An alternative idea entertained by [Johnson \(2019\)](#) is to make these constraints follow from models of ellipsis licensing that require antecedence to a possibly implicit question meaning in the discourse, such as can be found in [AnderBois 2011](#) and [Barros 2014](#) for sluicing and [Weir 2014a](#) for fragment answers, which arguably resemble stripping configurations at a certain level of abstraction. Again, details aside, there is reason to disprefer this type of account for TAC-stripping. Speaking in terms of Roberts’s (2012) Question Under Discussion (QUD) for concreteness, diagnostics presented in [Tonhauser 2012](#) suggest that the content of TACs is not-at-issue with respect to the QUD. For example, material in a TAC does not felicitously address an explicit QUD, as shown in (74).

- (74) A: Who left?  
B: #Kim read a book after Sue left.

It is also not possible for the content in the TAC to provide the alternatives for a question. As shown in (75), the content of the TAC cannot be targeted by answers. The example in (76) shows that the content in the second conjunct of coordinations, on the other hand, can be targeted by answers.

- (75) A: Did Kim read a book after Sue left?  
B: #No, Sue didn’t leave.
- (76) A: Did Kim leave and read the book?  
B: No, she didn’t read the book.

These differences between TACs and coordinations suggests that their content has a different status in the discourse. Specifically, TACs are not-at-issue content in the way conjuncts of a coordination are. Thus, it is not clear that defining ellipsis licensing conditions on TAC-stripping that require antecedence to a salient question meaning is possible. This in turn casts doubt on the ability for such a condition to derive the facts summarized in Table 1. Therefore, the following section will turn to providing an alternative analyses of these observations.

## 5 Ellipsis Bleeds Phrase Structure Representations

The analysis presented in this section attempts to attribute the observations in Table 1 to the ability to license ellipsis. This account builds on what is found in [Takahashi 2008](#). However, as we will come to see, the accounts generate different predictions which ultimately favor the approach presented here. I will start by making more explicit the proposed treatment of TACs. I will then introduce the ellipsis licensing condition to be adopted and demonstrate its use in vanilla instances of TAC-stripping. The remainder of this section shows how these assumptions correctly rule out those instances of TAC-stripping that violate the No Asymmetric Embedding constraint.

### 5.1 TACs and Ellipsis Licensing

That analysis to follow capitalizes on a more articulated treatment of TACs proposed by [Geis \(1970\)](#). Geis observed that certain TACs, including those introduced by *before* and *after*, are potentially ambiguous with respect to the events they order. The example in (77), for instance, might order Joan’s *leaving*-time before Harry’s *telling*-time (78a) or before the *leaving*-time that Harry provided (78b).

(77) Joan left [<sub>beforeP</sub> before  $\lambda 1$  Harry told  $t_1$  [ her to leave  $t_1$  ]].

- a. ‘Kim left before  $t$  such that Harry told her at  $t$  to leave.’
- b. ‘Kim left before  $t$  such that Harry told her to leave at  $t$ .’ ([Geis 1970:127](#), (42))

I will refer to this as the Geis-ambiguity. For [Geis \(1970\)](#), following similar suggestions by [Ross \(1964\)](#), this ambiguity revealed that TACs are effectively relative clauses for unexpressed nominal constituents. We will take a similar path and model this ambiguity by asserting the presence of a null-operator chain within the TAC. This operator is base-generated local to the predicate it modifies, moves to the edge of the TAC, and leaves behind a variable ( $t_n$ ). This is sketched for each interpretation of (77).

Among the reasons to think that these examples are derived via movement is the sensitivity of the Geis-ambiguity to the presence of island boundaries, as pointed out by [Geis \(1970\)](#). The example in (78) is similar to (77) but now separates the temporal connective *before* from the predicate *leave* by a Complex-NP boundary.

(78) Joan left [<sub>beforeP</sub> before  $\lambda 1$  Harry told  $t_1$  her of [ his desire [ for her to leave  $t_1$  ] ]].

- a. = ‘Kim left before  $t$  such that Harry told her at  $t$  of his desire for her to leave.’
  - b.  $\neq$  ‘Kim left before  $t$  such that Harry told her of his desire for her to leave at  $t$ .’
- ([Geis 1970:129](#), (55))

While the sentence in (78) has an interpretation where Joan left before the time at which Harry expressed his desire, it lacks an interpretation whereby Joan left before the time for her to leave that Harry desired. In other words, the embedded interpretation is missing. This can be understood as an effect of the Complex-NP Constraint violation induced by movement of the postulated null-operator.

Regarding the base-position of the temporal operator, [Takahashi \(2008\)](#) asserts that it is low enough on the verbal spine that it is contained in the elided constituent in instances of VP-ellipsis like (79).<sup>11</sup>

(79) Sue left [<sub>afterP</sub> after  $\lambda 1$  Joe did  $\langle$  leave  $t_1$   $\rangle$  ].

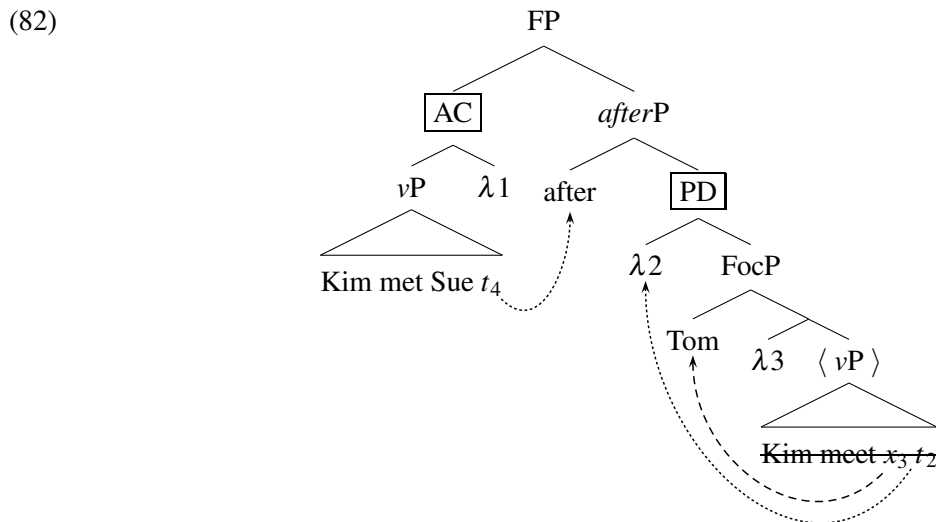
Without saying more, however, it is not clear that VPE should be licensed in this example. The elided constituent in this representation contains a bound variable that has no correlate in any available antecedent. This is something that is well-known to disrupt ellipsis-licensing, as (80) shows.

(80) \*Kim walked Anne's dog and Paul<sub>1</sub> did  $\langle$  walk his<sub>1</sub> dog  $\rangle$  too

Recognizing this problem, [Takahashi \(2008\)](#) adopts a proposal, made independently by [Fox & Nissenbaum \(2003\)](#) and [Larson \(1987\)](#), that TACs themselves undergo QR within their root clause. As shown in (81), the effect is the introduction of a temporal variable that creates a possible antecedent constituent for the ellipsis site.

(81) [<sub>afterP</sub> after  $\lambda 1$  Joe did  $\langle$  leave  $t_1$   $\rangle$  ]  $\lambda 2$  Sue [ left  $t_2$  ]

Incorporating these pieces into our account of phrasal TACs gives the representation in (82). The TAC undergoes an instance of covert movement that targets some functional projection (FP) outside the root vP. In accordance with the data presented in section 3.1.2, we can assume that this is still a relatively low position on the verbal spine.



<sup>11</sup>It is this assertion that we will take issue with in section 6, arguing that the base-position of the temporal operator is inside the constituent targeted by TAC-stripping but is outside the constituent targeted by VP-ellipsis.

To understand how ellipsis is licensed in this representation we will adopt the ellipsis licensing condition in (83). This is a slightly modified version of what can be found in [Rooth 1992a](#) and [Takahashi & Fox 2005](#).

- (83) Ellipsis of some XP is licensed only if:
- i.) there is a parallelism domain (PD) that contains XP,
  - ii.) there is an antecedent constituent (AC), and
  - iii.)  $\llbracket \text{AC} \rrbracket^o \in \llbracket \text{PD} \rrbracket^f$  for any variable assignment function  $g$ .

In prose, (83) says that a constituent (XP) may be elided on the condition that it is contained within some constituent (PD) whose focus semantic value, given any assignment function  $g$ , contains as a member the ordinary semantic value of some antecedent constituent (AC). As per the discussion in [4.3](#), the AC must be found in the overt syntax because TACs do not have access to implicit question meanings. The focus semantic value of a constituent is the set of alternatives that are derived by replacing focus marked constituents—which include at least the remnant in a phrasal TAC—with their type-matching alternatives.

In (84) we can see how to apply the ellipsis licensing condition in (83) to the example in (82).

- (84)
- a.  $\llbracket \text{AC} \rrbracket^o = \lambda t. \text{Kim met Sue at } t$
  - b.  $\llbracket \text{PD} \rrbracket^f = \{ p : \lambda t. \text{Kim met } x \text{ at } t \mid x \in D_e \}$
  - c.  $\llbracket \text{AC} \rrbracket^o \in \llbracket \text{PD} \rrbracket^f$  for any  $g$ , ellipsis is licensed.

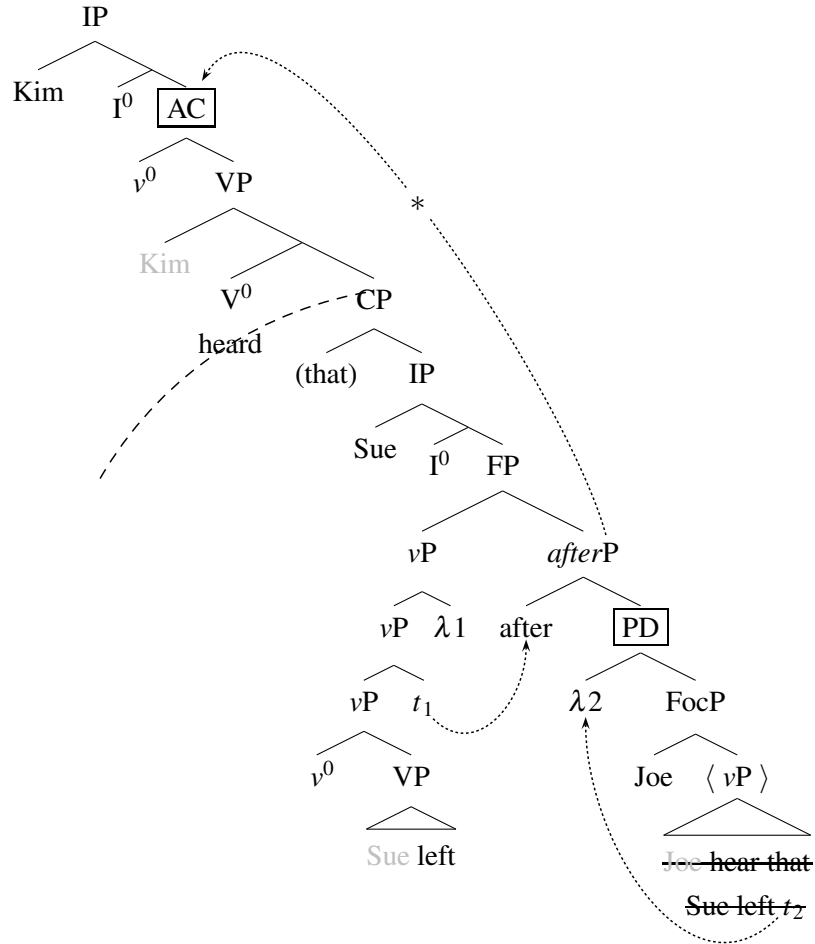
Given the presence of bound variables in the elided  $\langle \nu P \rangle$ , it will be necessary to define the PD as the node directly dominating the binder  $\lambda 2$ , which contains the binders for both elided variables. Only this will guarantee that an antecedent can be identified that, under any variable assignment function, is a member of the computed alternative-set. The constituent that contains the binder  $\lambda 1$  for the trace of the TAC provides an appropriate AC. Therefore, ellipsis of the  $\langle \nu P \rangle$  node is licensed a TAC-stripping configuration emerges.

## 5.2 Antecedent-contained TAC-stripping

We are now prepared to turn to the analysis of the data summarized in [Table 1](#). Let us start by considering the interpretations available to phrasal TACs that are adjoined to embedded clauses. As per the No Asymmetric Embedding constraint, the interpretation of the phrasal TAC cannot be resolved to the matrix predicate. The relevant example is repeated in (85) along with its proposed representation.

(85) a. \*Kim heard [<sub>CP</sub> (that) Sue had left after Joe  $\langle$  <sub>vP</sub> ~~heard that Sue had left~~  $\rangle$ ]

b.



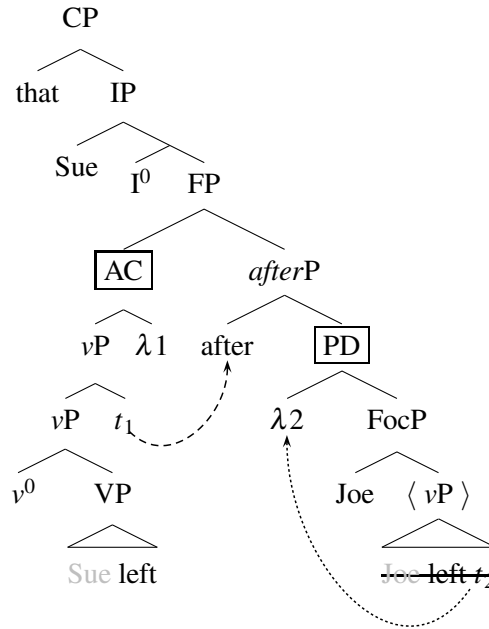
Given an ellipsis-based analysis of phrasal TACs, the ungrammaticality of this example can be understood straightforwardly as an instance of irreparable antecedent-containment that precludes the licensing of ellipsis. The general finite-clause boundedness of QR means the phrasal TAC in (85) will be trapped in the embedded clause and unable to escape the attempted antecedent. As (86) shows, the calculation of ellipsis licensing is expected to fail.

- (86) a.  $\llbracket \text{AC} \rrbracket^o = \text{Kim heard that Sue left at some } t \text{ after Joe heard that Sue left at } t'$   
 b.  $\llbracket \text{PD} \rrbracket^f = \{ p : \lambda t. x \text{ hear Sue leave at } t \mid x \in D_e \}$   
 c.  $\llbracket \text{AC} \rrbracket^o \notin \llbracket \text{PD} \rrbracket^f$  for any  $g$ , ellipsis is not licensed.

The intended AC is not something that can be derived by replacing focused marked elements in the PD with their alternatives.

The available interpretation for the string under consideration is one in which the ellipsis site is resolved to the embedded predicate. The relevant example is provided again in (87) along with a partial representation that includes just the embedded clause.

- (87) a. Kim heard [ (that) Sue left after Joe ~~left~~ ]  
 b.



The present analysis predicts the contrast on account of the fact that it is possible to identify an AC in this representation that does not contain the PD containing the elided constituent. The calculation of the licensing of ellipsis is provided in (88).

- (88) a.  $\llbracket \text{AC} \rrbracket^o = \lambda t. \text{ Sue left at } t$   
 b.  $\llbracket \text{PD} \rrbracket^f = \{ p : \lambda t. x \text{ left at } t \mid x \in D_e \}$   
 c.  $\llbracket \text{AC} \rrbracket^o \in \llbracket \text{PD} \rrbracket^f$  for any  $g$ , ellipsis is licensed.

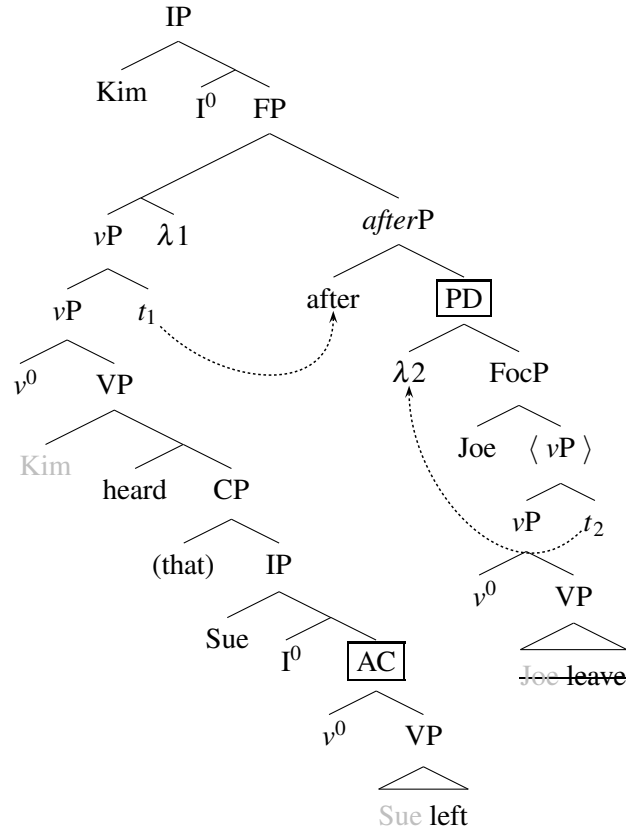
As in section 5.1, the PD will be required to contain the binder for the temporal operator variable inside the TAC. Unlike what we saw in (85), an acceptable AC can be identified that is a member of the set of focus alternatives that can be derived from the PD. Consequently, ellipsis is licensed.

### 5.3 Nonparallel Variable Binding

We turn now to the interpretations available to phrasal TACs that are adjoined to the matrix clause. In (89) is the proposed representation for the attempt to modify the matrix vP with a phrasal TAC and resolve the ellipsis site to an embedded vP.

(89) a. \*Kim heard [<sub>CP</sub> (that) Sue had left ] after Joe <<sub>vP</sub> leave >

b.



The ungrammaticality of (89) is not obviously expected. On any theory of ellipsis licensing the ungrammaticality could not be attributed to antecedent-containment of the ellipsis site or a constituent containing the ellipsis. As noted in the previous section, several analyses have attempted to tie similar effects in other domains something besides the ability to license ellipsis. I propose that, in the case of phrasal TACs, the ungrammaticality observed here is in fact an instance of unlicensed ellipsis. What does the work here—similar to [Takahashi 2008](#)—is the temporal operator-variable relationship that we have seen is present in the TAC. Because the TAC serves to modify the matrix predicate, it will be generated in a position adjoined to a projection of the matrix predicate. The relevant effect is that there will be not be a parallel temporal operator-variable relationship in the matrix predicate. It is the absence of this operator-variable chain that disrupts the calculation of ellipsis licensing.

The necessary PD for licensing ellipsis will be the same as we just saw above. An antecedent must be found for a constituent that contains the binder for the trace of the temporal operator. Because of the absence of a parallel operator-variable relationship in the embedded clause, however, there is no appropriate AC in the representation provided in (89). As shown in (90), the nearest possible AC that can be identified is not a member of the set of focus alternatives derived from the

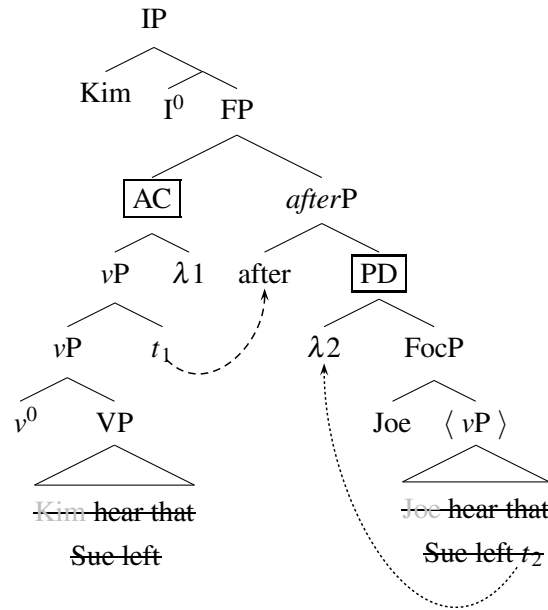


PD for the elided constituent.

- (90) a.  $\llbracket \text{AC} \rrbracket^o = \text{Sue left}$   
 b.  $\llbracket \text{PD} \rrbracket^f = \{ p : \lambda t. x \text{ leave at } t \mid x \in D_e \}$   
 c.  $\llbracket \text{AC} \rrbracket^o \notin \llbracket \text{PD} \rrbracket^f$  for any  $g$ , ellipsis is not licensed.

Again, the linear string under consideration is not unavailable. As per Table 1, the available interpretation is one in which the ellipsis site is resolved to the matrix predicate. This example with its representation is provided in (91).

- (91) a. Kim heard [ (that) Sue left ] after Joe ~~heard that Sue left~~  
 b.



The PD for which an appropriate AC must be found must still contain the binder for the elided temporal variable. However, the focus alternatives derived from this constituent, given the shape of the elided content, will now contain as a member the AC that is shown in (91). As shown in (92), it is determined that ellipsis is licensed on the intended interpretation.

- (92) a.  $\llbracket \text{AC} \rrbracket^o = \lambda t. \text{Kim heard at } t \text{ that Sue left}$   
 b.  $\llbracket \text{PD} \rrbracket^f = \{ p : \lambda t. x \text{ heard at } t \text{ that Sue left} \mid x \in D_e \}$   
 c.  $\llbracket \text{AC} \rrbracket^o \in \llbracket \text{PD} \rrbracket^f$  for any  $g$ , ellipsis is licensed.

At this point we can appreciate a specific prediction that this analysis makes with respect to the effect of TAC-stripping on the Geis-ambiguity. The requirement for parallel operator-variable binding that the ellipsis licensing condition in (83) enforces leads us to expect that TAC-stripping will also have an eliminative effect on the point of adjunction for the temporal operator inside the TAC and, therefore, on its possible interpretations. More plainly, this analysis predicts that the temporal operator cannot be generated as a modifier of the *leaving*-event within the TAC in (91). As shown below in (93), the resulting nonparallel binding chains in the PD and AC are expected to

disrupt ellipsis licensing.

- (93) a.  $\llbracket \text{AC} \rrbracket^o = \lambda t. \text{Kim heard at } t \text{ that Sue left}$   
 b.  $\llbracket \text{PD} \rrbracket^f = \{ p : \lambda t. x \text{ heard that Sue left at } t \mid x \in D_e \}$   
 c.  $\llbracket \text{AC} \rrbracket^o \notin \llbracket \text{PD} \rrbracket^f$  for any  $g$ , ellipsis will not be licensed.

This prediction is borne out. To see this, let us first convince ourselves that we observe the Geis-ambiguity in the kind of TAC under consideration. This is demonstrated in the slightly simplified example in (94) wherein Sue’s *leaving*-time is ordered after either the time at which Joe heard something or the time of Sue’s leaving that Joe heard about.

- (94) Sue left  $[_{\text{afterP}} \text{after } \lambda 1 \text{ Joe heard } t_1 [ \text{(that) she left } t_1 ] ]$ .
- 
- a. = ‘Sue left after  $t$  such that Joe heard at  $t$  that she left.’  
 b. = ‘Sue left after  $t$  such that Joe heard that she left at  $t$ .’

Consider again the example in (91), which is provided below with the relevant interpretations.

- (95) Kim heard [ (that) Sue left ]  $[_{\text{afterP}} \text{after } \lambda 1 \text{ Joe } \langle \text{heard } t_1 [ \text{that she left } t_1 ] \rangle ]$ .
- 
- a. = ‘After Joe heard at  $t$  that Sue left, Kim heard at  $t'$  that Sue left.’  
 b.  $\neq$  ‘After Joe heard that at  $t$  Sue left, Kim heard at  $t$  that Sue left.’

As indicated, the embedded interpretation for the temporal operator in the phrasal TAC in (95) is unavailable, as expected. This supports the proposed analysis of TAC-stripping as an instance of ellipsis. It also provides further support for the treatment of the No Asymmetric Embedding constraint as a the symptom of unlicensed ellipsis caused by nonparallel temporal operator chains.

## 6 The VP-ellipsis Puzzle

Having taken an ellipsis approach to accounting for the restricted distribution of phrasal TACs, we turn now to a second, yet still familiar puzzle. As has been observed previously, VP-ellipsis (VPE) is not subject to the No Asymmetric Embedding constraint. This distinguishes it from gapping and stripping, and now from the TAC-stripping operation that has been identified in phrasal TACs. It is also not obviously a result that is expected from the analysis presented above or the analysis of TACs presented in [Takahashi 2008](#). After establishing this extended paradigm, I will argue that the data reflect the fact that VPE targets a smaller constituent for ellipsis than does TAC-stripping.

### 6.1 The Extended Paradigm

Let us consider first the interpretations available to a VPE site inside of a TAC that is adjoined to an embedded clause.

- (96) \*Kim heard [ (that) Sue left after Joe did  $\langle$  ~~hear that Sue left~~  $\rangle$  ].  
 ‘Kim heard that, after Joe heard that Sue left, Sue left.’
- (97) Kim heard [ (that) Sue left after Joe did  $\langle$  ~~left~~  $\rangle$  ].  
 ‘Kim heard that, after Joe left, Sue left.’

As (96) shows, this configuration does not allow the VPE site to be resolved to the matrix predicate. It is possible, on the other hand, for the VPE site to be resolved to the embedded predicate, as in (97). This pattern mirrors what we saw in the previous section for TAC-stripping and is not necessarily a surprising finding. The structure and interpretation in (96) is expected to be unavailable as another instance of irreparable antecedent-containment. If, on the other hand, an antecedent is pulled from the embedded predicate, as in (97), it should be possible avoid antecedent-containment and license ellipsis.

The puzzle arises from the observation that a TAC adjoined to the matrix clause allows for a wider range of interpretations for a VPE site than we observed for a TAC-stripping site. The relevant data points are provided below.

- (98) Kim heard [ (that) Sue left ] after Joe did  $\langle$  ~~hear that Sue left~~  $\rangle$  .  
 ‘After Joe heard that Sue left, Kim heard that Sue left.’
- (99) Kim heard [ (that) Sue left ] after Joe did  $\langle$  ~~left~~  $\rangle$  .  
 ‘After Joe left, Kim heard that Sue left.’

In (98) we see that the VPE site in this configuration can be resolved to the matrix predicate, which we also saw is possible in the context of TAC-stripping. It is the grammaticality of examples like (99) that distinguish VPE from TAC-stripping. In this example, the VPE site is contained in a TAC adjoined to the matrix clause and is resolved to the embedded predicate. The state of affairs is summarized in Table 2.

		<i>antecedent</i>	<i>TAC-stripping</i>	<i>VPE</i>
<i>adjunction</i>	matrix	matrix	✓ (69)	✓ (98)
	matrix	embedded	* (68)	✓ (99)
	embedded	matrix	* (70)	* (96)
	embedded	embedded	✓ (67)	✓ (97)

Table 2: Possible source of the antecedent TAC-stripping and VP-ellipsis as a function of adjunction site.

As pointed out above, the similarities between TAC-stripping and VPE in embedded environments are expected and understood under an ellipsis-based account of these phenomena. What is unexpected is the ability for a VPE site in a matrix-modifying TAC to find an embedded antecedent. Recall that section 5.3 blocked this possibility in the context of TAC-stripping by asserting that the

presence of a temporal operator chain in the TAC, which is not paralleled by a similar relationship in the embedded clause, precludes the identification of an appropriate AC. The same should be true in the context of VPE if, as suggested by [Takahashi \(2008\)](#), VPE also targets a constituent that contains the trace of the temporal operator in the TAC.

I will argue in what follows that we should no longer maintain the idea that the VPE site contains the trace of the temporal operator variable. The effect we will see is that, in the context of VPE, it is possible to search for a smaller AC, which the embedded clause is able to provide.

## 6.2 *VP-ellipsis v. TAC-stripping*

The asymmetry identified above can be made to follow, I argue, from the assertion that VPE is ellipsis of a smaller constituent than what is elided in TAC-stripping. The basic idea finds support from a number of asymmetries between the two ellipsis operations.

The first is relatively familiar from the recent literature regarding the size of VPE relative to other instances of ellipsis (e.g., [Merchant 2013](#)). The voice feature that is interpreted in a VPE site can differ, under certain circumstances, from the voice feature that is present in the antecedent constituent. Representative examples are provided in (100).

- (100) a. ?The photos must be found before the police do ~~< find them >~~.  
 b. ?The camera can still be used after the photographer does ~~< use it >~~.

In minimally differing examples that involve TAC-stripping in (101), the same kind of mismatch is not tolerated to the same degree.

- (101) a. \*The photos must be found before the police<sub>1</sub> ~~< x<sub>T</sub> find them >~~.  
 b. \*The camera can still be used after the photographer<sub>1</sub> ~~< x<sub>T</sub> uses it >~~.

The contrast can be taken to indicate a difference in the size of the elided constituent. As [Merchant \(2013\)](#) suggests, VPE elides a constituent below the head responsible for voice properties of a predicate. Thus, the voice features in the root clause predicate and the TAC are not subject to any kind of identity constraint and can vary in the way shown above. TAC-stripping, on the other hand, we can assert is ellipsis of a constituent that does contain the relevant voice head. Therefore, the TAC-stripping site must find an antecedent with a matching value for voice.

Second, note that when both the antecedent and ellipsis site are passive, as in (102), the passive auxiliary can escape VPE.

- (102) a. The photos must be found before the documents must (be) ~~< found x<sub>T</sub> >~~.  
 b. The trash should be emptied after the recycling<sub>1</sub> should (be) ~~< emptied x<sub>T</sub> >~~.

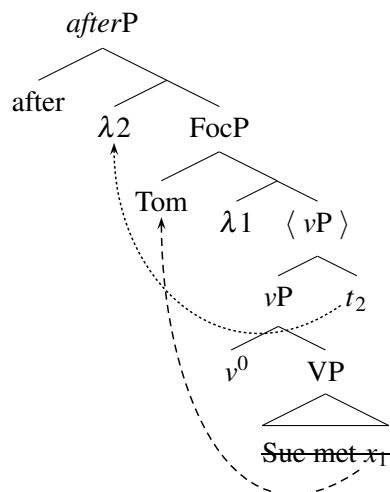
This can be taken to reveal that VPE may in fact target various different kinds of constituents, including one that does not contain the passive auxiliary (e.g., [Sailor 2014](#)). However, we do not find the same kind of variability with TAC-stripping. The examples in (103) show that it is not

possible for the passive auxiliary to escape the ellipsis site.<sup>12</sup>

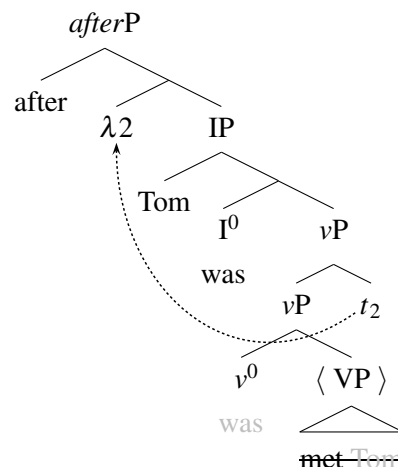
- (103) a. The photos must be found before the documents must (\*being)  $\langle$  found  $x_T$   $\rangle$ .  
 b. The recycling should be emptied before the trash<sub>1</sub> (\*being)  $\langle$  emptied  $x_T$   $\rangle$ .

The contrasts above can be understood by modeling VPE and TAC-stripping as ellipses operations that target different size constituents, as shown in (104) and (105).

(104) TAC-stripping



(105) VP-ellipsis



TAC-stripping is intended to be ellipsis of at least the argument structure of the predicate, the functional structure that introduces voice, and the trace of the temporal operator. Following Merchant (2013), VPE is ellipsis of the argument structure of the predicate to the exclusion of the functional structure that introduces voice.<sup>13</sup>

<sup>12</sup>These examples can be compared to the data point in (33) where we find that TACs otherwise embed passive verbal small clauses.

<sup>13</sup>Providing an analysis of the difference between TAC-stripping and VPE that is consistent with all of the properties of VPE identified by (Sailor 2014) is beyond the scope of this manuscript and must be left future research.

However, we are in a position now to comment on one of the remaining arguments from Penka & von Stechow (2011) against a reduced analysis of phrasal TACs. They point out that phrasal TACs cannot contain more than one constituent in addition to the temporal connective, as in (i).

- (i) Mary drank the beer after Peter ~~drank~~ the whiskey.

(adapted from Penka & von Stechow 2011:441, (27a))

The argument is that this contrasts with phrasal comparatives, which do allow multiple remnants (Lechner 2004), suggesting that phrasal TACs are not elliptical. On the account of phrasal TACs being proposed here, the reason that multiple remnants are not possible in TAC-stripping can be made to follow from the assumption that the second remnant *the whiskey* is generated by the same processes that have been proposed to generate gapping and pseudogapping. In particular, suppose that Heavy-NP Shift, Object Shift, or both is required to move *the whiskey* to a position where it escapes the ellipsis operation (Jayaseelan 1990, Lasnik 1999, Takahashi 2004, Johnson 2009). We can assert that the positions targeted by these displacement operations lower than the node targeted for ellipsis in TAC-stripping, which we have seen elides a constituent larger than the constituent targeted by VPE.

That said, I do not currently have a response to the observation that phrasal TACs only embed nominal constituents, as shown in (ii).

- (ii) a. Kate spoke to Nate after Frank.

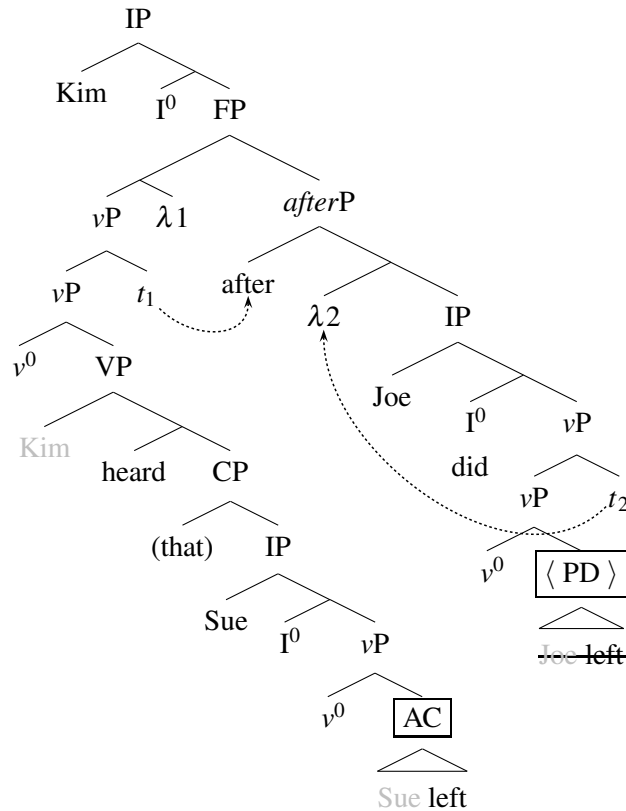
### 6.3 The Puzzle Solved

Most relevant for the puzzle at hand is the assertion that VPE is ellipsis of a constituent that does not contain the trace of the temporal operator. Given our condition on ellipsis-licensing in (83), not including the trace of the temporal operator in the VPE site makes it possible to search for a smaller AC than is necessary for TAC-stripping. This is because, in the case of VPE, there will be no bound variables in the ellipsis site.<sup>14</sup>

To see this, consider the proposed representation for the case of a matrix-adjoined TAC with a VPE site that is resolved to the matrix predicate. This is provided in (106) and should be contrasted with (89).

(106) a. Kim heard [<sub>CP</sub> (that) Sue [<sub>VP</sub> left ]] after Joe did <<sub>VP</sub> left >

b.



As argued in section 6.2, VPE is ellipsis of a constituent smaller than the constituent that contains the trace of the temporal operator. This means that it will not be necessary to identify a PD any larger than the deleted constituent. Because the deleted constituent does not have to find an AC with

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b. \*Kate spoke to Nate after to Frank.

This is a puzzle that I hope future research will be able to shed light on.

<sup>14</sup>This requires that we adopt the position that neither A-movement nor X<sup>0</sup>-movement introduce variables that require extending the PD (Messick & Thoms 2016, Overfelt to appear, cf. Hartman 2011).

a trace of a temporal operator, the embedded VP now provides a possible antecedent. As shown in (107), the result is that ellipsis is licensed in this representation and the sentence is grammatical.

- (107) a.  $\llbracket \text{AC} \rrbracket^o = \text{Sue left}$   
 b.  $\llbracket \text{PD} \rrbracket^f = \{ p : x \text{ left} \mid x \in D_e \}$   
 c.  $\llbracket \text{AC} \rrbracket^o \in \llbracket \text{PD} \rrbracket^f$  for any  $g$ , ellipsis is licensed.

In sum, the wider distribution of VPE relative to TAC-stripping can be understood as a function of the ability to license ellipsis given the additional claim that both phenomena involve ellipsis but target different size constituents.<sup>15</sup>

## 7 Conclusion

This manuscript has argued that phrasal TACs can be derived by an ellipsis operation that targets the truncated complement in a low-adjoined *before*P or *after*P. It was argued that the elided constituent is larger than what is targeted in standard VP-ellipsis, but smaller than the elided constituent in genuine stripping (Pancheva 2009, Weir 2014b). I referred to this constituent as  $\nu$ P. The single remnant in a phrasal TAC was argued to be generated by  $\bar{A}$ -movement to a focus position outside the elided constituent, as Depiante (2000) has proposed for canonical stripping.

We also adopted an articulated syntax-semantics mapping that involved covert movement of and within the TAC (Geis 1970, Larson 1987, Takahashi 2008). These pieces together provided a way to account for the observation that phrasal TACs have a more constrained distribution than either their clausal counterparts or VPE. Put simply, trying to identify an antecedent that is a constituent other than the  $\nu$ P that the phrasal TAC directly modifies will necessarily fail. This was the result of creating an irreparable antecedent-containment configuration (section 5.2) or requesting an antecedent that lacks a binding relationship parallel to the temporal operator-variable relationship in the ellipsis site (section 5.3). The differing distribution of TAC-stripping and VPE was argued to be an effect of VPE eliding a smaller constituent that does not include the TAC's temporal operator-variable relationship. This made it possible in the case of VPE, but not in TAC-stripping, for a constituent that also lacked this relationship to serve as a licensing antecedent (section 6).

What we are led to with respect to the constraints on ellipsis is that the identity condition is stated semantically over variable syntactic domains, as per Rooth (1992a). Recall that this was motivated in part by the observation in section 4.3 that TACs are not-at-issue with respect to the QUD and, thus, could not obviously be anteceded by the QUD. Moreover, the licensing constraint

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<sup>15</sup>At this point, one should wonder why something like VPE is not possible in a phrasal TAC such as (89). If a smaller constituent that did not contain the trace of the temporal operator were elided, the problem of non-parallel binding would not arise. Two possibilities come to mind for why this is not possible: (i) the relevant head that licenses ellipsis of VP is not present as a result of truncation or (ii) the focus movement involved in TAC-stripping induces a MAXELIDE-type effect that forces ellipsis of the larger  $\nu$ P (e.g., Merchant 2008). Choosing between these options must be left for future research.

that was adopted made it possible to identify different syntactic constituents as the antecedent for different ellipses. This is how VPE and TAC-stripping were distinguished in a way that captured their differing distributions.

We can conclude by pointing out that, in taking this approach, we have lost the ability to account for the ungrammaticality of examples like (108), from [Hardt & Romero 2004](#), which formed part of the empirical domain for [Takahashi \(2008\)](#).

(108) Agnes [<sub>VP<sub>1</sub></sub> arrived after John [<sub>VP<sub>2</sub></sub> ate *t* ]], but Bill didn't  $\Delta_{1/*2}$ .  
([Hardt & Romero 2004:384](#), (34))

The relevant observation is that, while the VP<sub>1</sub> can, the VP<sub>2</sub> in the TAC in the first conjunct cannot serve as an antecedent for the VPE site in the second conjunct. For [Takahashi \(2008\)](#), the presence of a temporal operator trace in the embedded VP<sub>2</sub> rendered it unavailable as an antecedent for the elided VP, which lacks a counterpart to this temporal operator. However, I argued in section 6 that VPE is not sensitive to these types of operator variable relationships. Recall that this was formalized by treating VPE as ellipsis of a constituent smaller than that elided in TAC-stripping. Thus, while [Takahashi \(2008\)](#) incorrectly predicts (99) to be ungrammatical, the analysis presented here seems to incorrectly predict that VP<sub>2</sub> should provide an antecedent to the VPE site in (108).

For [Hardt & Romero \(2004\)](#), (108) is a symptom of a discourse-accessibility condition on ellipsis. In short, they propose that a constituent must be discourse accessible in order to serve as an AC. To be discourse accessible, the potential AC must c-command in the discourse representation tree what we have called the PD. Asserting that (109) is the discourse representation tree for (108), the constituent S1 does, but the constituent S2 does not c-command the constituent that contains the ellipsis site. Thus, S2 cannot serve as an AC for ellipsis licensing.

(109)

```

graph TD
    BUT[BUT] --- S1[S1]
    BUT --- Bill[Bill didn't Δ1/*2]
    S1 --- AFTER[AFTER]
    S1 --- S2_top[S2]
    AFTER --- Agnes[Agnes arrived]
    AFTER --- S2_bottom[S2]
    S2_bottom --- John[John ate]
    
```

(adapted from [Hardt & Romero 2004:385](#), (34))

[Hardt & Romero \(2004\)](#) do not discuss in detail the discourse representation for embedded complement clauses. Therefore, it is unclear to me exactly what predictions this analysis makes with respect to the data discussed in sections 4–6. Future research could attempt to extend this analysis in such a way as to help us understand the available facts. Alternatively, one might pursue a discourse-accessibility condition on ellipsis licensing that defines discourse-accessible as being at-issue with respect to the QUD. While TACs are not at-issue with respect to the QUD, as we saw in section 4.3,



at least some embedded complement clauses are. Therefore, it could be possible to tie the ability of a constituent to serve as an antecedent to its status as at-issue or not-at-issue in the discourse.

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