

# Constituency and Agency in VP

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## 1. Introduction

This paper concerns the phrase *do so*, its internal structure, and what its internal structure says about the structure of VPs in general. *Do so* is a ‘pro-VP’, a phrase that replaces a VP when its content can be recovered from context.

- (1) Max studied French and Mary did so, too  
= Max studied French and Mary studied French, too.

I claim that *do* in *do so* is an overt reflex of a functional head that licenses the external argument in eventive VPs, the head that Kratzer (1996) calls *voice* and Chomsky (1995) calls *little-v*. This head combines with a constituent containing the verb and its internal arguments and contributes an external argument to it. This paper consolidates and extends similar proposals by Ross (1972), McCawley (1974), Dowty (1979) and others. It begins with a clarification of the difference between *do* in *do so* and the English ‘dummy auxiliary *do*’.

### 1.1. *Do* in *do so* is a main verb, distinct from ‘dummy auxiliary *do*’

Example (2) gives the impression that *so* in *do so* is optional.

- (2) a. Max studied French and Mary did so, too.  
b. Max studied French and Mary did, too.

But *did* in (2b) is not the *did* of *did so*, but rather the dummy auxiliary *do* that is inserted in English by default whenever affix hopping is blocked, namely in questions, constructions with *not*, and constructions where the VP has been deleted, stranding tense.

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\* I would like to extend my appreciation to Maire Noonan, Ora Mutashansky, and the audiences of the Linguistics Undergraduate Colloquium Series of Concordia University, Montreal and WCCFL 23, Davis for fruitful and entertaining discussion.

- (3) a. Did Max study French? [Interrogative]  
 b. Max did not study French. [Negation]  
 c. Max did. [VP deletion]

That *do so* and dummy auxiliary *do* are distinct expressions is illustrated by the fact that they may co-occur, as in (4), and these cases establish that *so* in *do so* is obligatory (5).

- (4) a. Did Max do so?  
 b. Max did not do so.
- (5) a. \*Did Max do?  
 b. \*Max did not do.

## 2. *The internal structure of do so*

There is one context in which *do so* appears without *so*, namely in pseudoclefts.

- (6) a. What Max didn't do was study French.  
 b. \*What Max didn't do so was study French.

However, pseudoclefts contain a *wh*-phrase in the first part (the part preceding the copula). *Wh*-phrases leave a gap, and in light of (5), what seems to be missing in (6a) is *so*, and indeed *so* and the *wh*-phrase are in complementary distribution, as (6b) shows, suggesting they share the same base position.

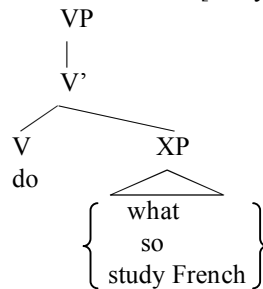
Operators like *what* in (6) form predicates abstracted over the position they originate in. The second part of the pseudocleft (the part following the copula) is of the same syntactico-semantic type as the position indexed by *what*, illustrated by the alternations in (7)-(9).

- (7) a. What Mary shot at \_\_\_\_ was a pheasant.  
 b. Mary shot at a pheasant.
- (8) a. What Mary is \_\_\_\_ is patient.  
 b. Mary is patient.
- (9) a. What \_\_\_\_ was unusual was that Mary didn't show up.  
 b. That Mary didn't show up was unusual.

In light of the generalization in evidence in (7)-(9), the phrase *study French* in (6a) would seem to have the same syntactico-semantic type as the trace, which is the same as the type of its antecedent *what*, which is the

same as the type of *so*, with which it is in complementary distribution (6b). (10b) appears to be a component of the base structures for both (1) and (6) and related examples.

- (10) a. What<sub>i</sub> Max didn't do  $t_i$  is [study French]<sub>i</sub>  
 b.



If this conclusion is correct, then some process must be at work hiding *do* in when it is adjacent to a main verb, as is the case in the first conjunct in (1) but not the second conjunct. Section 3 returns to this issue.

### 2.1. Restrictions on the complement of *do*

Non-eventive VPs, including the auxiliary-headed predicates in (13b-c) and (14b-c), are incompatible with *do so* replacement. That is, XP in (10b) must be marked as [+eventive].

- (11) \*What Max does is love studying French.  
 (12) \*Max loves studying French, and Mary does so, too.  
 (13) a. What Mary has been doing is writing a wine review.  
 b. \*What Mary has done is been writing a wine review.  
 c. \*What Mary does is have been writing a wine review.  
 (14) Max has been writing a wine review...  
 a. ...and Mary has been doing so, too.  
     do so = write a wine review  
 b. ...and Mary has done so, too.  
     do so ≠ be writing a wine review  
 c. ...and Mary does so, too.  
     do so ≠ have been writing a wine review.

### 3. *Do and subject licensing*

*Do so* insertion also breaks down in a variety of contexts that include, for example, passives (other examples discussed below).

- (15) a. \*Max was arrested and Mary was done so, too.  
 b. Max was studying French and Mary was doing so, too.  
 c. The police were arresting Max.  
 d. Max was being arrested.

*Do so* may not replace a VP (*arrest* in this case) in a passive context, but it may in an active context (15b). The eventiveness restriction is not the source of the ungrammaticality of (15a), since both *arrest* and *be arrested* are clearly eventive, as they may occur in the progressive (15c-d), which only eventive predicates may (Vendler, 1957).

The ungrammaticality of (15a), I will claim, has the same source as the ungrammaticality of the examples in (16).

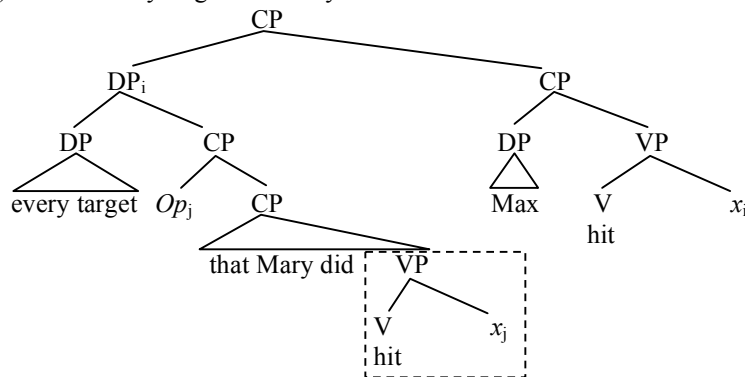
- (16) a. \*Max hit every target that Mary did so.  
 b. \*I know which sonatas Max played, but I wonder which ones Mary did so.

The examples in (16) contrast with similar examples with VP deletion (and dummy *do* insertion) instead of *do so* replacement, shown in (17).

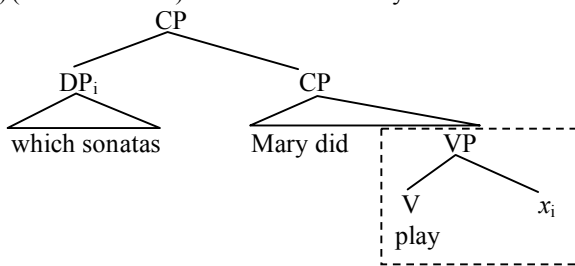
- (17) a. Max hit every target that Mary did.  
 b. I know which sonatas Max played, but I wonder which sonatas Mary did.

In (17a), the quantified NP *every target that Mary did* undergoes covert quantifier raising out of the VP (Sag, 1976, May, 1985), deriving the LF in (18), where the boxed VP is empty in the surface structure, but interpreted under identity with the matrix VP as diagrammed. (17b) involves overt wh-movement, with the empty VP in the second clause interpreted under identity the VP in the first, diagrammed in (19).

(18) Max hit every target that Mary did.

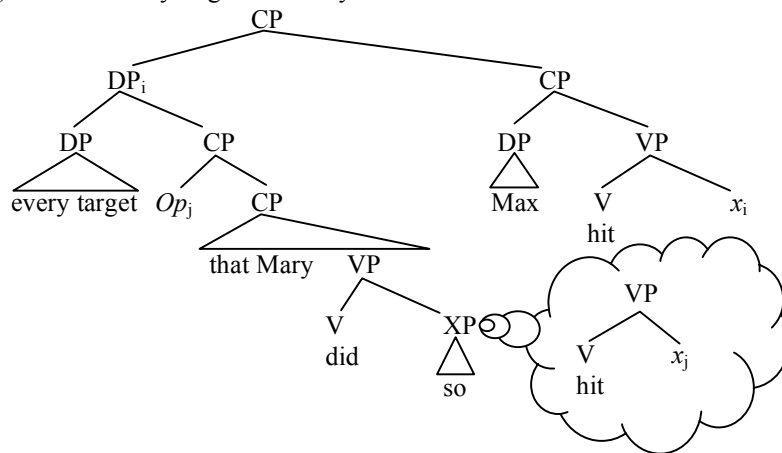


(19)(...but I wonder) which sonatas Mary did.

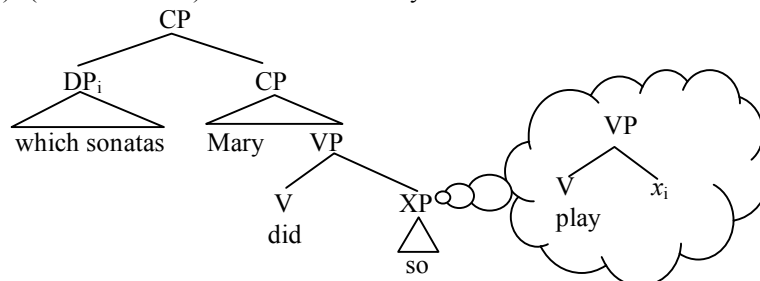


This process fails when the VP to be recovered is *do so*. The ungrammatical sentences in (16a-b) have the structures in (20) and (21) respectively.

(20) \*Max hit every target that Mary did so.



(21) \*(...but I wonder) which sonatas Mary did so.



But *do so* is grammatical in similar structures without movement.

- (22) a. Max hit that target and Mary did so, too.  
 b. Max played *Eine Kleine Nachtmusik* and Mary did so, too.

The examples in (22) differ from those in (16) in that there is movement in both CPs in (16) but in neither in (22) or other grammatical examples like (1). A potential explanation for the difference in grammaticality between (16) and (22) then is that the antecedent of *so* must not have an empty category in it. (23) and (24) show that this is not a complete explanation.

- (23) a. ?Which target did Max hit and Mary do so, too?  
 b. ?The police already know which pictures Max destroyed; all we can do is wish he hadn't done so.

The examples in (23) are cases in which the antecedent of *do so* has an empty category in it, but there is no displaced element in the CP containing *do so* that could bind the variable in the recovered VP. That variable is bound by the wh-phrase *which target* in (23a), apparently across the board, and in (23b) it seems to be interpreted as an E-type pronoun (*do so* = *destroyed the pictures that he destroyed*). These configurations are apparently not optimal, as the examples in (23) are awkward compared to (22), but they contrast remarkably with (16), and so do not explain the ungrammaticality of (16).

Note that the variable in the deleted VP in the grammatical structures in (18) and (19) has a different index than the variable in the VP that antecedes deletion. This lack of correspondence between the two VPs is apparently invisible to whatever metric of sameness licenses deletion under identity, a kind of flexibility that gives rise to 'sloppy identity' (Sag, 1976). A possible explanation, then, for the ungrammaticality of (16), that would spare (23), is that *do so* resists sloppy identity. But this is not the case:

(24) Max lost his keys and Jose did so, too.

The most natural reading of (24) is that Max lost Max's keys and Jose lost Jose's keys, the sloppy reading in which the variable *his* has a different referent in the recovered VP in the second conjunct than it has in the first. This is just the process at work in (17), at work in the interpretation of *do so* also, and therefore not a possible source of the ungrammaticality of (16).

The ungrammaticality of (16) then appears to have its source in the one remaining respect in which the data in (16) differ from that in (22), namely that displacement occurs in the CP containing *do so* in (16) but not in (22). This observation extends to the passive case in (15a), since the CP containing *do so* in that example also contains the displaced DP *Mary*, promoted from object position.

**Observation:** Nothing may be related by movement to *so*.

In this respect, *so* truly resembles a pronoun, as pronouns have the same property. The *wh*-phrase in the second conjunct in (25b) cannot bind the variable in the recovered interpretation for *them* = *pictures of x*.

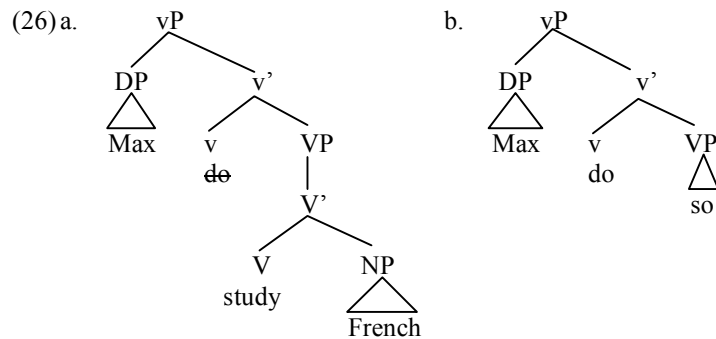
- (25) a. Who<sub>i</sub> did Max buy pictures of *x<sub>i</sub>*?  
 b. \*Mary doesn't know who<sub>i</sub> Max bought **pictures of *x<sub>i</sub>***, but *I* know who he bought **them**.

Though *so* and pronouns can 'contain' variables, including traces, bound or not (see (23)), they cannot contain variables bound by an element displaced from the position held by the bound variable. In short, they do not contain any theta-positions in which a phrase could be base generated. This appears to be the critical difference between *so* replacement (16) and VP deletion (17). VP deletion involves the non-pronunciation of a VP under identity with an antecedent. The unpronounced verb is present in the structure with its theta grid intact, and licenses movement. *So* replacement is true VP pronominalization, with the interpretation of *so* established at LF through an anaphoric relationship to an antecedent. *So* has no theta grid, and does not introduce any dependents into the structure.

However, if that is the case, then it means that the subject in all the cases where *do so* occurs grammatically must **not** be related by movement to *so*.

**Consequence:** The subject in a grammatical CP headed by *do so* is not related by movement to *so*.

*So* replaces a constituent which includes the lexical verb and its dependents but excludes the external argument and *do*, suggesting that the external argument is a dependent of *do*, not of the lexical verb. In this respect *do* has the function attributed to ‘voice’ in Kratzer (1996) and ‘little-*v*’ in Chomsky (1995), of relating an external argument to an event, in this case an event further described by *so*, or ultimately, whatever the antecedent of *so* is. The fact that every eventive verb can be replaced by *do so* suggests that this function of *do* is general, even in cases where *do* is not overt (evidence follows in section 3.1). (26) characterizes *do* as a little-*v* that introduces an individual DP and an event description VP. VP may be pronominalized by *so*, as in (26b) (or as *what*, as in pseudoclefts), in which case *do* is overt. Otherwise, *do* is unpronounced (26a).



Assuming head movement of big-*V* to little-*v* prior to PF, the conditions on the pronunciation of little-*v* are as follows, where  $\wp$  is a function that maps a syntactic head to its pronunciation, and (27b) overrules (27a) ((27a) is the elsewhere condition).

(27) a.  $\wp (v^0) = /du/$   
 b.  $\wp \left( \begin{array}{c} v^0 \\ \swarrow \quad \searrow \\ V^0 \quad v^0 \end{array} \right) = \wp (V^0)$

That is, the pronunciation of little-*v* with a head adjunct big-*V* is just whatever the pronunciation of big-*V* is, while the pronunciation of bare little-*v* is *do*. Note that this generalization is remarkably similar to the conditions on the occurrence of dummy auxiliary *do*:

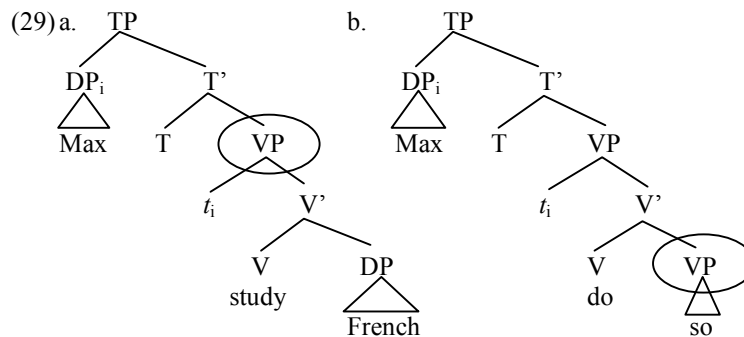


- (28) a.  $\emptyset (T^0) = /du/$   
 b.  $\emptyset \left( \begin{array}{c} T^0 \\ \swarrow \quad \searrow \\ X^0 \quad T^0 \end{array} \right) = \emptyset (X^0)$

T is pronounced *do* whenever it is stranded. If it syntactically combines with a head adjunct X, the pronunciation of T is whatever the pronunciation of X is, be it an auxiliary, modal, or main verb. The latter case presents a complication in that the main verb does not move to T at PF in English, which is of course where the pronunciation function applies. However, tense morphology *is* expressed on the verb at PF, meaning that tense and the main verb do somehow combine prior to PF. The mechanisms of this dependency are famously unclear. There is a clear parallel, however, between the different uses of *do*. Both T and little-*v* are pronounced *do* when stranded at PF. The fact that the conditions proposed here on the pronunciation of little-*v* collapse with known conditions on the pronunciation of T lends some credence to the proposal made here and undermines a potential counterargument discussed in the following section.

### 3.1. Some remarks on an alternative analysis

The proposal outlined above is an inference based on the behavior of *do so* and pseudoclefts, generalized to garden variety transitive constructions. The fact that garden variety transitives do not in and of themselves implicate a hidden *do* opens the door to an alternative analysis, which is that while the phrase *do so* and pseudoclefts behave as described above, with *do* mediating the relationship between a VP and an external argument, illustrated in (29b), garden variety transitive constructions behave as traditionally described since Koopman and Sportiche (1991), with the subject originating in the maximal projection of the main verb and no *do* present at any level, illustrated in (29a).



In the (conventional) alternative sketched in (29), the issue of when and why *do* disappears does not arise. However, this alternative does not allow us to dispense entirely with the rules stated in (27) governing the distribution of *do*, since they are still required in the form of (28) for the analysis of dummy auxiliary *do*. This alternative therefore does not spare us any syntactic machinery. On the contrary, it begs the question of why one cannot, on analogy to (29b), utter (30) (impossible given (27)).

(30) \*Max did not do study French.

Another counterargument against the alternative resides in the fact that the alternative takes the syntactic category of *so* to be the same as that of a bona fide VP. That is, the two circled nodes in (29a-b) are of the same syntactic type. But this is not so, since they are not subject to the same syntactic processes. For example, VP-deletion targets bona fide VPs, but not *so*, as the contrast in (31) shows (recall also (5)).

- (31) a. Mary studied French, but Max didn't [<sub>VP</sub> e ]  
 b. \*Mary studied French, but Max didn't do [<sub>VP</sub> e ]

In fact, the analysis presented in the present study, that e.g. *study French* has category vP while *so* has category VP, preserves a complementarity found in English between deletion and pronominalization. Categories that can be pronominalized cannot be elided, and vice versa, as evidenced in for example the fact that English does not display pro-drop. DPs can be pronominalized but not elided. Likewise, VPs can be pronominalized by *so* (we should say 'proverbalized'), but not elided (31b). vPs can be elided, as in (31a), but not pronominalized, as (32) shows, where *did* is the dummy auxiliary.

(32) \*Mary studied French, but Max didn't so.

#### 4. *The interpretation of do so*

Landman and Morzycki (2003) analyze *so* and its cognates in several Indo-European languages as a pro-manner, where a 'manner' is a 'kind' in the sense promoted by Carlson (1977). (33) illustrates *so* as a pro-kind for individuals, and (34) as a pro-kind for events (i.e. a manner).

- (33) a. Wir haben so einen Hund gesehen      [German]  
 we have so a dog seen  
 'We saw a dog like that.'                      [e.g. a rotweiler, etc.]

- b. ik zou zo 'n hond willen hebben. [Dutch]  
 I would so a dog want have  
 'I would like to have a dog like that.'
- (34)a. Er hat so getanzt. [German]  
 he has so danced  
 'He danced like that.' [e.g. clumsily, etc.]
- b. Hij danst zo. [Dutch]  
 he danced so  
 'He danced like that.'

Landman and Morzycki define *so* as a description of either individuals or events ( $x$ ), asserting that the individual or event is of kind  $k$ , where  $k$  is determined by context.

- (35)  $[[so_i]] = \lambda x . x \text{ realizes } k_i$       [ $k$  is a kind,  $x$  an individual or event]

It has been pointed out that verbs themselves may include a manner component for the event they describe. Dowty (1979) mentions that *electrocute*, *drown*, *strangle*, etc. all describe different manners of killing. Krifka (1999) claims that the sentence *Ann threw the box to Beth* is decomposed as in (36), where *throw* indicates the manner of the event that causes the box to move to Beth.

- (36)  $\exists e \exists e'$  [agent( $e$ , Ann), manner(throw)( $e$ ), theme( $e$ , box), cause( $e$ ,  $e'$ ),  
 move( $e'$ ), theme( $e'$ , box), goal( $e'$ , Beth)]

If manner modifiers are event descriptions (modulo the 'realization of' relation), they are of the same semantic type as VPs, and indeed VPs themselves sometimes denote manner. Landman and Morzycki's analysis of *so* as an event description with a deictic component extends naturally to the use of *so* postulated here. *Do* relates an individual to an event of the description *so*, whose interpretation is in turn borrowed from a syntactic antecedent.

### 5. Conclusion

*Do* is present in eventive predicates, though not always pronounced. In the cases discussed above (but see appendix), it denotes the agent-of relation between the agent and an event described by the VP complement of *do*. *So* is such a VP.

- (37) a.  $[[so_i]] = \lambda e . e \text{ realizes } k_i$   
 b.  $[[study \text{ French}]] = \lambda e . e \text{ realizes } study \text{ French}$   
 c.  $[[do(x, P)]] = \exists e [P(e) \ \& \ agent(x, e)]$
- (38) a.  $[[do(x, so_i)]] = \exists e [e \text{ realizes } k_i \ \& \ agent(x, e)]$   
 b.  $[[do(x, study \text{ French})]] = \exists e [e \text{ realizes } study \text{ French} \ \& \ agent(x, e)]$

### Appendix

*Do so* is surprisingly felicitous with unaccusative verbs.

- (39) a. Max arrived at midnight and Mary did so, too.  
 b. The ice cream melted quickly and the popsicles did so, too
- (40) a. What Max did was arrive at midnight.  
 b. What the ice cream did was melt quickly.

The striking difference between (15a) and (39) shows that unaccusatives and passives diverge with respect to some tests for movement, even if they pattern together with respect to others (Burzio, 1986). This divergence requires an explanation of its own, which I will not undertake here. A reasonable starting point, however, is that subjects of unaccusatives, unlike subjects of passives, have the *option* of being base generated as external arguments (arguments of *do*). If that is so, it means that *do* does not uniformly assign the ‘agent’ theta role, since subjects of unaccusatives are themes, as so readily explained by the promotion analysis. That *do* does not always assign ‘agent’ seems quite reasonable in light of the fact that in certain other cases it seems to not assign any theta role at all, as in the context of 0-place predicates.

- (41) a. What it did was rain cats and dogs.  
 b. What it did was become dark.

There is one point of divergence, however, in the behavior of unaccusatives in the context of *do* and the behavior of agentive predicates. Note preliminarily that in pseudoclefts, the verb in the second part of the pseudocleft may appear in either the tense expressed in the first part of the pseudocleft (past tense below), or in the unmarked non-finite form, with a slight preference for the non-finite form.

- (42) a. What Max did was study French.  
 b. What Max did was studied French.

- (43) a. What Max did was play that tune we used to love.  
 b. What Max did was played that tune we used to love.
- (44) a. What Max did was write a letter explaining everything.  
 b. What Max did was wrote a letter explaining everything.
- (45) a. What Max did was take the oil to the recycling center.  
 b. What Max did was took the oil to the recycling center.

The past tense form of the verb in the *b*-examples is in my opinion slightly degraded with respect to the non-finite form in the *a*-examples, though I am not sure the distinction is so great as to merit a question mark for the *b*-examples. But for unaccusative verbs, the distinction is much more robust.

- (46) a. What Max did was arrive at midnight.  
 b. \*What Max did was arrived at midnight.
- (47) a. What the ice did was melt almost instantly.  
 b. \*What the ice did was melted almost instantly.
- (48) a. What the water did was drain from the pool.  
 b. \*What the water did was drained from the pool.
- (49) a. What the cement did was solidify with Mary's boot stuck in it.  
 b. \*What the cement did was solidified with Mary's boot stuck in it.

The same generalization holds for 0-place verbs.

- (50) a. What it did was rain cats and dogs.  
 b. \*What it did was rained cats and dogs.
- (51) a. What it did was become dark.  
 b. \*What it did was became dark.

The same generalization also holds for 1-place predicates of propositions, including the raising verbs, though unlike unaccusatives (and like passives), they resist pseudoclefting in the first place.

- (52) a. ??What it did was seem like Mary would win the race.  
 b. \*What it did was seemed like Mary would win the race.
- (53) a. ??What it did was feel like the world was coming to an end.  
 b. \*What it did was felt like the world was coming to an end.

These data indicate that while *do* introduces an external argument, tense is involved in relating the external argument thematically to the main verb. This is an odd conclusion from the perspective of the current theory, and I will not try to make sense of it here.

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