On the syntax of "tritransitive" verbs

This essay takes a brief look at the putative phenomenon of verbs that take three internal arguments. Such verbs could be called "tritransitive", but note that the scare quotes are non-trivial; I argue that these verbs do not exist in English, or even perhaps at all.

In a Larsonian (1988) "VP-shell" analysis of ditransitive verbs, the only available positions for arguments of the verb are the specifier and complement of VP – the subject is a specifier of vP. If these are the only positions available then a verb cannot select three internal arguments. I will attempt to solve this problem by arguing that some of the supposed arguments of tritransitive verbs are not verbal arguments at all.

Section 1 is a brief catalogue of the putative tritransitive verbs I will consider. Section 2 considers some of the strategies that English has for increasing verb valency, and Section 3 looks at whether the verbs in my catalogue have employed these strategies. Section 4 briefly outlines a proposal explaining tritransitive verbs in terms of an applicative projection, "APPL". Section 5 is a short run-down of problems that should be addressed if the proposal is to be taken seriously, and Section 6 is a summary of the essay.

1. An inventory of putative tritransitive verbs

Verbs with three internal arguments select a variety of categories, but the roles of the arguments intuitively seem similar. This is a small catalogue of the verbs I will be considering along with their supposed subcategorization frames. I have identified four classes.

1.1 Verbs of exchange

There are several verbs of the "trade" type that take a beneficiary NP argument followed by the two exchanged items, an NP and a "for"-PP.

(1) *trade [NP NP PP]*
John traded [Mary] [a chocolate bar] [for a packet of crisps]

Near-synonyms include "swap", "exchange", and "substitute", but the tritransitive use of these is more marked. These are a distinct class from verbs of sale (below) because the direction of exchange is not specified by the category or order of the arguments; consider (1b-c):

(1) b. I'll swap you your chocolate bar for my packet of crisps
c. I'll swap you my chocolate bar for your packet of crisps

We will also see that they behave differently with regard to the status of the PP.

1.2 Verbs of sale

Verbs of the "sell" type take a beneficiary NP, a theme NP, and an exchanged item or amount of money in a "for"-PP.

(2) *sell [NP NP PP]*
John sold [Mary] [a burger] [for $1]

All near-synonyms of "sell" – e.g. "hock" and "flog" – accept this frame, as well as antonyms like "buy".

1.3 Verbs of penalty
These are verbs of the "fine" type, which take a beneficiary (or maleficiary?) NP, followed by some kind of penalty NP, and a "for"-PP.

(3) *fine [NP NP PP]*
John fined [Mary] [$50] [for jaywalking]

Verbs of this type include "penalise", "tax", and "dock". Antonyms that also accept this frame include "reward", "reimburse", and "compensate".

1.4 Wagering verbs
Verbs like "bet" take patient and theme NPs and a "that"-CP.

(4) *bet [NP NP CP]*
John bet [Mary] [five bucks] [that she couldn't eat a cueball]

"Wager" and "pledge" also accept this frame, but only to a much more limited extent in my English. This class is particularly interesting, as these are the only purported tritransitive verbs not to include a "for"-PP complement.

2. Some operations that increase verb valency
It will be necessary to examine whether any of the internal arguments of tritransitive verbs are introduced optionally. It may be the case that they are not arguments of the verb directly, but of some functional head. Perhaps they could also be adjuncts. Here I look at optional arguments to regular transitive verbs with a view to drawing parallels with the subcategorization frames of the tritransitive verbs above.

2.1 Optional beneficiary
Many verbs of English can take what looks like an additional argument denoting the intended beneficiary of the action.

(5) a. John killed a deer
b. John killed Mary a deer

It is unlikely that "Mary" in this construction is an adjunct in the regular sense – its position adjacent to the verb does not seem as marked as an adjunct PP or adverb[1].

(6) a. ?John killed for Mary a deer
b. ?John killed quickly a deer

[1] I assume all adverbs are adjuncts. This may be problematic, but I hope it is a sensible assumption for my purposes.

It is also fixed in its position next to the verb – it does not extrapose rightward or leftward, as we expect of adjuncts.

(7) a. John killed a deer for Mary
b. John killed a deer quickly
c. *John killed a deer Mary

(8) a. For Mary, John killed a deer
b. Quickly John killed a deer
c. *Mary, John killed a deer

Nor can "Mary" alone inhabit the pivot of a cleft, unlike our canonical adjuncts.

(9) a. It was for Mary that John killed a deer
b. It was quickly that John killed a deer
c. *It was Mary that John killed a deer

2.1.1 Limitations of the optional beneficiary

The construction has some interesting limitations. While "kill a deer" and "bake a cake" can easily take optional beneficiaries, many verbs do not tolerate one.

(10) a. *John broke Mary a vase
b. *John swept Mary the floor
c. *John ate Mary a sandwich
d. *?John ran Mary a marathon

I propose that the explanation for this lies in the technical meaning of "beneficiary". I suggest that, much like standard ditransitive verbs like "give", the beneficiary must in some sense be meant to receive the object denoted by the theme argument. This is to say, if John makes Mary a sandwich then the sandwich is intended to be given to her. (10c) cannot make sense because Mary clearly will not receive the sandwich. (10d), on the other hand, is marginally acceptable if the marathon is, say, a charity event for the benefit of Mary's terminal illness.

While some verbs with a prepositional particle will accept an optional beneficiary, it must always intervene between the verb and the particle. The theme argument must follow the particle; it cannot intervene between the verb and particle as well. In my opinion, the explanation for this is most likely prosodic.

(11) a. John blew Mary up a bridge
b. ?John blew up Mary a bridge
c. *John blew Mary a bridge up

(12) a. John put Mary on a record
b. ?John put on Mary a record
c. *?John put Mary a record on

(13) a. John filled Mary up her gas tank
b. ?John filled up Mary her gas tank
c. *?John filled Mary her gas tank up

Finally, the theme must be indefinite. A theme DP bearing the definite article will usually render the sentence ungrammatical.

(14) a. *John killed Mary the deer
b. *John baked Mary the cake

This is, however, subject to some pragmatic considerations – compare (14b) to (15):

(15) John baked Mary the cake she had always wanted

The contrast between (14b) and (15) seems to say more about the definite article than it does about optional beneficiaries. I would argue that (14b) is bad because the definite article seems to imply that there was a cake in particular that John intended to bake. Perhaps we do not think of cakes in this way – we do not know which cake we are going to get until it is baked. (15), conversely, is only acceptable because there definitely *was* a cake in particular that John had in mind.

2.2 Optional cost "for"-PP

The "for"-PP present in verbs of exchange, sale, and penalty can be optionally added to many verbs. The only verbs I know of that do not accept it are psych verbs that invoke uncontrollable mental states – although these could be improved with an odd enough context.

(16) a. John broke a vase for $5
b. John swept the floor for $5
c. John ate a sandwich for $5
d. John ran a marathon for $5

(17) a. *John felt ill for $5
b. *John wondered if he should quit smoking for $5
c. *John knew the answer for $5
d. *John considered modern art pretentious for $5

In the grammatical cases, it is unclear who the cost applies to. Did John earn $5 by running the marathon, or did he have to pay the $5 entry fee? It is possible that this alternation is due to adjunction height, or to the same PP being construed alternately as an adjunct and an argument, or to some other factor entirely. Section 2.2.1 investigates this briefly.

2.2.1 Limitations of the optional cost "for"-PP

Some verbs can take the same PP as a complement or as an adjunct, yielding different meanings:

(18) a. John hid his toys in the box
b. John got angry with Mary

The "in"-PP in (18a) can, as a complement, refer to the hiding place of the toys. It is also construable as a locative adjunct, in which case the entire event of John hiding his toys occurs inside the box. Likewise, in (18b) John could be angry *at* Mary (if "with" functions as a complement to the verb), or he could simply be angry while Mary accompanies him (as an adjunct).

Crucially, the PP can be disambiguated in favour of the adjunct construal by framing the sentence as a pseudocleft with the PP within the initial "wh"-phrase[2]:

(19) a. What John did in the box was hide his toys
b. What John did with Mary was get angry

Thus we have a useful test for detecting adjuncts. If we apply this test to the "for"-PP cases in (16) we get:

(20) a. What John did for $5 was break a vase
b. What John did for $5 was sweep the floor
c. What John did for $5 was eat a sandwich
d. What John did for $5 was run a marathon

In each case there is no disambiguation of meaning – it is still unclear who the cost applies to. This indicates that on both readings the "for"-PPs are construed as adjuncts. There is no meaning that the original sentences in (16) had that the sentences in (20) do not also have; this seems indicative that the "for"-PP cannot be arguments of the verb. If they were, we might expect some additional ambiguity in (16).

"For"-PPs also behave like adjuncts in their distribution; they can be fronted, and can occupy the pivots of clefts.

(21) a. For $5 John broke a vase
b. For $5 John swept the floor
c. For $5 John ate a sandwich
d. For $5 John ran a marathon

(22) a. It was for $5 that John broke a vase
b. It was for $5 that John swept the floor
c. It was for $5 that John ate a sandwich
d. It was for $5 that John ran a marathon

They also seem not to be able to occupy the "object" position of verbs with a prepositional particle, i.e. intervening between the particle and the verb.

[2] I investigate the interaction of pseudoclefts and PPs in my undergraduate thesis – do ask for a copy if you are interested. Essentially, this is a useful test because pseudoclefts are not formed by a syntactic operation on the original sentence; only adjunct PPs may co-occur with main-verb "do" in the pivot of the pseudocleft.

(23) a. *John blew for $5 up a bridge
b. *John put for $5 on a record
c. *John filled for $5 up Mary's gas tank

Again though, this is most likely due to prosodic rather than phrase structure reasons.

3. Tritransitive verbs in comparison

3.1 "For"-PPs again

On the strength of the behaviour in section 2.2.1 above, I conclude that the optional "for"-PP is an adjunct. However, not all "for"-PPs are optional. The PPs in verbs of sale and penalty certainly are, since they can be left out entirely:

(24) a. John sold Mary a burger
b. John fined Mary $50

But the ones in verbs of exchange are not:

(25) ?John traded Mary a chocolate bar

It is possible, then, that the "for"-PP in a verb of exchange is a true argument of the verb. The pseudocleft test seems to confirm this:

(26) *?What John did for a packet of crisps was trade Mary a chocolate bar
(c.f. What John did for a packet of crisps was trade Mary a chocolate bar *for it*)

The other cases of "for"-PPs in putative tritransitive verbs behave more oddly. The pseudocleft test seems to indicate that the PP in verbs of sale is in fact an adjunct, as it seems to retain its only readings:

(27) What John did for $1 was sell Mary a burger

But the PP in verbs of penalty cannot appear in a pseudocleft without completely distorting the original meaning:

(28) #What John did for jaywalking was fine Mary $50

This is because the "for"-PP in verbs like "fine" denotes an action carried out by the theme, i.e. Mary. The test does not apply in this case – it is impossible to host the "for"-PP in pivot position without altering the sentence meaning.

3.2 Optional beneficiaries again

The "benefactive applicative" is a commonly attested feature of the world's languages (Haspelmath & Müller-Bardey 1991) – this includes any operation of adding a benefactive internal argument. Indonesian is offered as an example:

(29) a. Orang itu me-masak ikan
man ART TR-cook fish
"The man cooked fish"

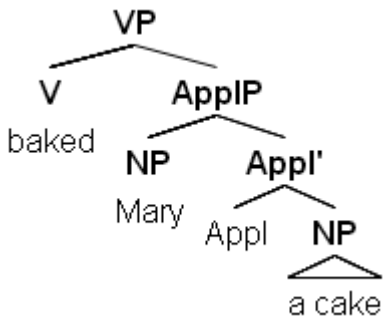
b. Orang itu me-masak-kan perempuan itu ikan
man ART TR-cook-APPL woman ART fish
"The man cooked the woman fish" (Chung 1976)

The verb in (29b) receives an applicative suffix "-kan". It is plausible, then, that since the verb cannot take a benefactive argument without this morphology showing up, perhaps the beneficiary is not an argument of the verb at all, but an argument of the applicative marker. If this were the case, then it would not be too much of a stretch to extend the logic to English, which may have a silent applicative marker. This would explain the strictly post-verbally adjacent distribution of optional beneficiaries, and it would avoid the problem of having to suppose that almost every verb optionally subcategorizes for an optional additional argument. It would also guarantee that the beneficiary receives an identical semantic role, regardless of the verb, which is what we have observed – the beneficiary must be intended to receive the object (recall the discussion of (10) in section 2.1.1).

4. A closer look at the English benefactive applicative

In Pylkkänen's (2000) analysis of the English applicative, APPL is a head that takes what would ordinarily be the verb's internal argument as an internal argument. It then takes the beneficiary as a specifier, and the entire projection is merged as the verb's internal argument.

(30)

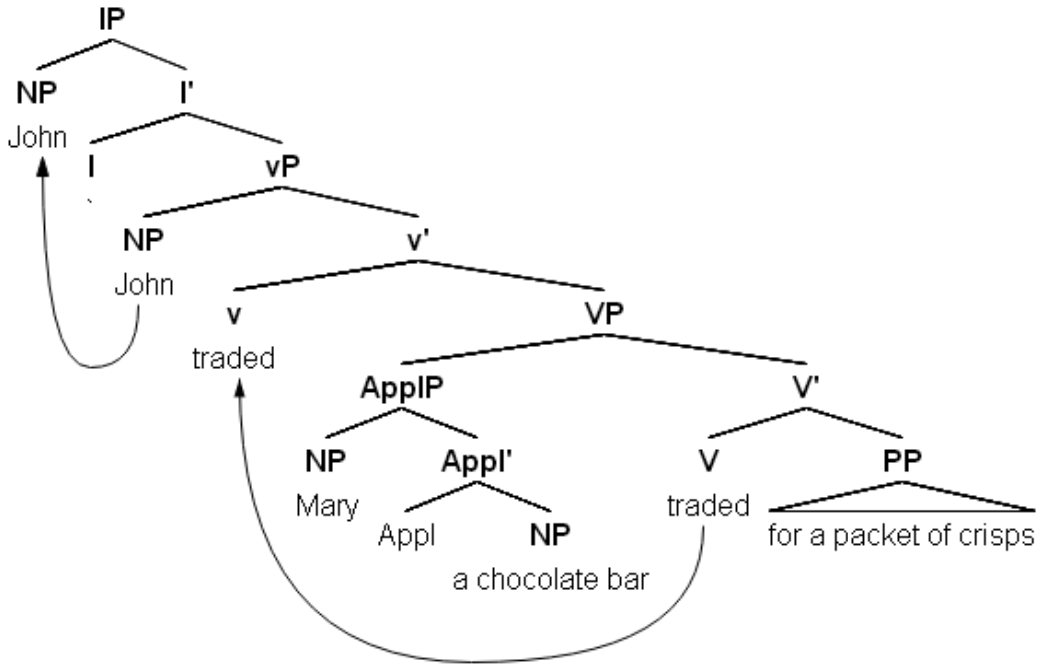


This arrangement allows the semantics to work out nicely – "Mary", in specifier position, can be the intended recipient of the cake, and the semantics of APPL can be designed such that "the cake" is passed up to combine with the verb as if it were its true internal argument.

In Larson's (1988) "VP-shell" analysis of the double object construction, only two positions were available for internal arguments: the specifier and complement of VP. If we assume that APPLP can occupy the specifier of VP then Larson's analysis can be reconciled with the existence of "tritransitive" verbs. All such cases of these verbs, then, are in fact ditransitive

verbs where one of the internal arguments is an APPLP containing the beneficiary and theme.

(31)



This proposal explains all the cases of purported tritransitive verbs I set out to investigate in Section 1. It also explains the freedom that most English verbs have to accept an optional beneficiary; all such cases involve an APPL structure. In each case (as I showed above in (10a-d) the beneficiary is not an argument of the verb, but an argument of APPL interpreted as the intended recipient of the theme argument.

Pylkkänen (2000) also points out that, because of the semantics of APPL, English verbs will not accept a beneficiary if there is no internal argument of the verb. We can see that this is true, even in cases where the object is implicit (the underscore in (32b) is my theory-neutral way of representing the missing object):

(32) a. *John ran Mary
b. *John baked Mary __

5. Some problems

While the Larsonian/APPL-based analysis of tritransitive verbs that I proposed above certainly has its merits, it also runs afoul of some theoretical considerations. These issues should certainly be ironed out before the proposal is to be taken seriously, but doing so is unfortunately beyond the scope of this essay.

5.1 Undergeneration of ambiguities

Recall (1b-c):

(1) b. I'll swap you your chocolate bar for my packet of crisps
c. I'll swap you my chocolate bar for your packet of crisps

Because of the semantics of APPL, the beneficiary must be the intended recipient of the verbal argument adjacent to it. The kind of tree in (31), then, predicts that (1b) should be ungrammatical. The fact that it is not indicates either that the proposal is wrong, the semantics of APPL should be tweaked, or that something complicated is happening in the syntax of this example.

5.2 Constituency

The kind of tree in (31) predicts that "Mary a chocolate bar" should behave as a constituent. It is quite difficult to run constituency tests on this, since there is not really a proform or relative pronoun or wh-word that will stand in for this kind of person-object pair.

(33) a. *It was Mary a chocolate bar that/who John traded for a packet of crisps
b. *It was Mary five bucks that/who John bet that she couldn't eat a cueball

(34) a. *What/who did John trade for a packet of crisps?
*Mary a chocolate bar

b. *What/who did John bet that she couldn't eat a cueball?
*Mary five bucks

Nor can "Mary a chocolate bar" or "Mary five bucks" be passivised:

(35) a. *Mary a chocolate bar was traded for a packet of crisps by John
b. *Mary five bucks was bet that she couldn't eat a cueball by John

The constituency in (31) also predicts that "trade Mary a chocolate bar" should not form a constituent to the exclusion of the PP. Tests seem to indicate that this is not the case:

(36) It was trade Mary a chocolate bar that John did for a packet of crisps

Perhaps, though, this is a case of construing the PP as an adjunct. In the case of "bet", in which the "that"-CP is certainly an argument of the verb, the same test returns negative:

(37) *It was bet Mary five bucks that John did that she couldn't eat a cueball

I therefore consider this discussion of constituency inconclusive. At the very least, it certainly is not supportive of the proposal in Section 4.

5.3 Verbs of penalty

The semantics of APPL ensures that the beneficiary is the intended recipient of the theme. It is unclear, in this case, what to make of examples like (3):

(3) John fined Mary $50 for jaywalking

Clearly Mary is not the intended recipient of the fifty dollars here. Perhaps in this case the beneficiary *is* a true argument of the verb, but the valency of "fine" still does not exceed three because the "for"-PP is *not* an internal argument.

5.4 Theta-assignment
Assuming some GB-theoretic model of theta-assignment (e.g. Chomsky 1981), the tree in (31) has some problems. Assuming "the chocolate bar" is still really an argument of the verb, it is unclear how it would receive a theta-role, especially since there is an intervening NP, "Mary". Perhaps it is the entire ApplP that receives a theta-role, while Appl distributes its own theta-roles to its two arguments. This seems unnecessarily circuitous to me.

5.5 Case-assignment
Assuming some GB-theoretic model of case-assignment (e.g. Chomsky 1981), similar issues arise. "Trade" and "the chocolate bar" are never in a spec-head relation or a c-command relation without "Mary" intervening, so it is unclear how "the chocolate bar" would ever receive case from the verb.

5.6 Variable binding
Because of the extra layer that ApplP adds, neither the beneficiary or theme of a verb like "trade" should be able to bind into the PP. This is not the case:

(38) a. John traded every girl a chocolate bar for her packet of crisps
b. John traded Mary every Pokémon for its evolved state

5.7 Direct counterexamples
If Appl is in principle available to every verb, it is unclear why some verbs will not accept it, even in contexts where it would make complete sense.

(39) a. *?John rescued Mary her cat
b. *?John collected Mary some leaves
c. *?John founded Mary a university

These verbs do not seem to form a class to the exclusion of the ones that permitted an Appl argument. If verbs, then, must be marked somehow for whether they permit an Appl argument, we may as well say they have an optional beneficiary and not propose Appl at all.

6. Discussion and Summary
Clearly the ApplP proposal is in need of some shaping up, but I believe the intuition is right. Subject to some syntactic tweaking, it is certainly plausible that beneficiaries are not arguments of verbs, but of a null head that identifies them as intended recipients of one of the verb's objects. This explains the intuition that beneficiaries are optional for most verbs while always playing the same semantic role. Most importantly, though, it reduces the maximum valency of English verbs to three – the beneficiary "argument" of each of the

"tritransitive" verbs in Section 1[3] is not a true argument of the verb, so these cases can be analysed as ditransitive constructions. This makes phrase structure analyses which predict a maximum verbal valency of three – like Larson's (1988) – workable despite the existence of such verbs. It also suggests that any theory predicting higher verbal valency is on the wrong tracks.

Merits aside, such a proposal direly requires more sophisticated reconciliation with existing theories of, for example, case and theta assignment than I am capable of in this essay. Some research is also required into the cross-linguistic manifestations of APPL, and the possible non-existence of true tritransitive verbs.

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[3] Save for verbs of penalty, see section 5.3