The Instrumental Role: Argument or Adjunct?*

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1. Introduction and Overview

In this paper, I investigate the status of the instrumental role with respect to the argument-adjunct distinction. I propose that the instrumental role is not an independent Θ-role. What is understood as the instrumental role is one among other possible realizations of a more general *cause* role. When an instrumental occurs together with an agent, the cause role is distributed across the two constituents, and we have a discontinuous role.

This paper is organized as follows: First, I demonstrate that it is possible, in principle, for a role to be distributed across several syntactic constituents. This readily happens with adjunct constituents, but I also show that arguments can share a role with another constituent as well. When two constituents share a role, they each express the role with a different degree of relative specificity (one constituent is more general than the other). This gives a semantic asymmetry that corresponds directly to a distributional asymmetry in the syntax. I then show that agents and instruments exhibit the same distributional asymmetries, suggesting that role discontinuity is involved with these as well. This analysis of the instrumental gives us a solution to the problematic status of the instrumental constituent with respect to the argument/adjunct distinction. The argument/adjunct distinction is usually characterized as a binary distinction determined by the lexical properties of the verb — arguments are constituents that the Projection Principle and Θ-Criterion care about. Adjuncts, on the other hand, are outside of the domain of these components of grammar. This binary distinction is not sufficient to characterize the range of behaviour that is observed with, for example, PPs in English. Role discontinuity provides us with a mechanism whereby a constituent can be linked to an argument without itself being an argument. This gives us a principled and well-defined middle ground between arguments and adjuncts.

2. Role Discontinuity: Locatives

In this section, I demonstrate that it is possible for a semantic role to be shared by several separate syntactic constituents. For this discussion, I focus on the locative role, although parallel arguments can be raised for other semantic roles as well.

2.1   *Locative Adjuncts*

It is generally accepted that it is possible for there to be multiple locative adjuncts in a single clause. Consider, for example, the sentences in (1).

(1)   Emily saw Molly in Toronto at Eatons.
       Emily saw Molly at Eatons in Toronto.

The two locative PPs both provide information about the location of Emily seeing Molly. They occur in free order (with well-defined consequences for the interpretation of focus), and there can even be constituents intervening, as can be seen by the examples in (2).

(2)   Emily saw Molly in Toronto last night at Eatons.
       Emily saw Molly at Eatons last night in Toronto.

Although it is possible to have more than one locative adjunct in a clause, these are not independent of one another. It is necessary that the locative constituents all be compatible with a single interpretation of the location of the event. So, for obvious reasons, sentences like those in (3) will not be acceptable.

(3)   *Emily saw Molly in Toronto in Montreal.
       *Emily saw Molly at Eatons at Robarts Library.

These sentences are ill-formed because the two locative constituents do not designate a single location for the event. This illustrates a semantic restriction on multiple locatives — the constituents must be interpreted as picking out a single location, with each constituent expressing a different degree of precision. One constituent sets a general locative reference, and the other further specifies a location within this framework. The interpretation of the location of the event is distributed across all constituents that express the location.

I adopt the following terminology: A *role discontinuity* occurs when a semantic role is distributed across more than one syntactic constituent. Each of these constituents that share a single role is a *disconstituent* of the role discontinuity. In the examples that have been under consideration, there is a locative discontinuity. Each locative constituent is a disconstituent of this locative discontinuity.

The semantic restriction on role-discontinuity is stated in (4):

(4)   **Semantic Restriction on Discontinuity**
       If X1,...Xn are disconstituents of a role(i)-discontinuity for some semantic role, role(i), then X1,...,Xn must cumulatively identify a single interpretation for role(i), and

$$X1 \supset X2 \supset .... \supset Xn$$

(where X1 $\supset$ X2 is to be read "X1 is a more general or coarser-grained constituent than X2 in the interpretation of the role").

In the case of the locative role, coarser-grained is defined in the obvious way, with respect to nesting of regions within regions — a topographical subsetting relation.

This semantic restriction on role discontinuity is, in many ways, similar to the effects of one of the clauses of the Θ-Criterion; namely, that each role be uniquely satisfied (although this is normally considered only to apply to subcategorized arguments). It is very much like having a single locative slot available per clause, which can be filled by at most one interpreted location. A locative slot can be satisfied by a single, possibly conjoined locative adjunct. It can be satisfied by multiple locative adjunct constituents provided that their meanings allow them to be interpreted as "zooming in" on a single locative reference — that is, provided that they be disconstituents of a locative-discontinuity. This proposal does, however, involve a radical departure from the Θ-Criterion in its standard application with respect to arguments. The Θ-Criterion normally implies that each Θ slot be syntactically unique. Here, at least in the case of adjuncts, the restriction seems to have to do with a unique interpretation. Multiple syntactic constituents can satisfy the same role provided that these constituents satisfy semantic conditions guaranteeing a unique interpretation.

The semantic notion of granularity is an asymmetric relation, and this asymmetry carries over to the syntax, constraining the distribution of the disconstituents. Consider the contrast apparent in the sentences in (5).

(5)   In Toronto, Emily saw Molly at Eatons.
       *At Eatons, Emily saw Molly in Toronto.

While there is free order among post-verbal VP adjuncts, only the coarsest-grained disconstituent, the most general one, can occur in the structurally higher topicalized position at the start of the clause.

I argue elsewhere that the relevant structural relationship at work here is m-command (Brunson 1992), as given in (6), with the added provision that only the uppermost projection counts in an adjunction structure. This provision gives us the m-command relationships in (7) for adjuncts.

(6)   If $X1 \supset X2$ then $X1$ must m-command $X2$

    α m-commands β iff α does not dominate β, and every maximal projection, γ, that dominates α dominates β.

(7)   i)   mutual m-command between all adjuncts of a projection
        ii)   mutual m-command between an adjunct of XP and a specifier/complement of that XP.

2.2   *Locative Arguments*

In this section, I extend this account of locative adjuncts to more central locative arguments.

2.2.1 External and Internal Locative

The distinction between VP-external and VP-internal locatives extends back at least to Chomsky (1965), where Chomsky noted that certain types of prepositional phrases occur in "closer construction to verbs", and these internal locatives are contrasted with locatives that "modify the entire VP or perhaps the entire sentence". Using the sentence in (8) as an example, Chomsky pointed out that the first PP cannot prepose, as in (9a), while the second PP can optionally prepose to the beginning of the sentence, as in (9b).

(8)   He decided on the boat on the train.

(9)   a.   On the train, he decided on the boat.
        b.   *On the boat, he decided on the train.

Notice, however, that in this example there is no locative-discontinuity, since the first PP is not locative, even though it does contain a typically locative preposition. "The boat" here is the theme. As Chomsky points out, when there is only one "on" phrase, the sentence is ambiguous, it could be either a theme or a location. In a theory that permitted only one locative, this disambiguating function of the second locative could be explained. Although the approach here allows for locative discontinuity, the disambiguating function of the second "on" phrase can readily be accounted for by the semantic restriction in (4). "On the boat" and "on the train" do not satisfy this restriction, and hence they cannot both be interpreted as locatives in a locative discontinuity.

Throughout the literature there is a distinction that is made between at least two types of post-verbal prepositional phrases, depending on the relationship of the PP to the verb. There are those PPs that occur within the VP constituent (internal PPs, complements, participants (Halliday 1970), PPs in construction with the verb (Gruber 1976)), and there are PPs that occur outside the VP (external PPs, adjuncts, circumstantials (Halliday 1970), sentential PPs (Reinhart 1981)).

Following Chomsky (1965), PP preposing is frequently considered to be a diagnostic of the external status of a PP. However, given that arguments can topicalize, the internal/external to VP distinction has little predictive power with respect to the preposability of a PP. Clearly subcategorized PPs can topicalize, particularly if the sentence is embedded in a context which facilitates the topicalized reading. So, for example, the sentence in (10) is not as bad as it should be if internal PPs cannot topicalize.[1]

(10)   On the table, John put the book.

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1. Sentences such as this do need pragmatic, as well as intonational support. In particular, there can be no major intonational break between the topic and the subject. The fragile grammaticality of such examples offers some explanation for the disputes in the literature about the acceptability of sentences like (10).

There is, however, a contrast between (10) and (11), where an external PP can readily topicalize.

(11) At Eatons, Emily saw Molly.

A subcategorized locative is required, by the Projection Principle, to be present in the VP at d-structure. This forces a syntactic derivation for sentence (10). Non-subcategorized PPs have no such d-structure requirement — they can be base-generated as VP adjuncts, or even as IP adjuncts. So, there are a number of syntactic accounts possible for (11). The adjunct might have originated as a VP adjunct and moved (by topicalization) to an IP-adjoined position, or it might have originated in situ, as an IP adjunct. Given that non-subcategorized PPs are generally quite free in their distribution, it is to be expected that (11) be better than (10). I claim that (10) is grammatical and comparable to argument topics such as the one in (12).

(12) Beans, I like.

2.2.2 Inner and Outer Locatives

A further distinction that is related to the internal-external contrast is frequently made in the literature. The claim is that there are two types of interpretations for locatives: the inner locative and the outer locative (see Starosta 1978, Ostler 1980, Somers 1987, among others). This contrast can be seen by comparing the sentences in (13) and (14).

(13) John washed his car in the garage.
(14) John put his car in the garage.

An outer locative, as in (13), locates the entire action, while an inner locative, as in (14), specifies the location of the theme alone.

Locative-discontinuity can occur with outer locatives (the examples of discontinuous locative adjuncts involved outer locatives). It is also possible to construct sentences with a locative-discontinuity involving inner locatives. Consider, for example, the sentences in (15):

(15) a. John keeps his bike in the garage near the skis.
      b. John put those two new books on the top shelf near the novels.
      c. John put the answer on the first page in the margin.

When one of these PPs is topicalized, we find the expected asymmetries.

(16) a. i) In the garage, John keeps his bike near the skis.
        ii) *Near the skis, John keeps his bike in the garage.
    b. i) On the top shelf, John put those two new books near the novels.
        ii) *Near the novels, John put those two new books on the top shelf.
    c. i) On the first page, John put the answer in the margin.
        ii) *In the margin, John put the answer on the first page.

So, even with subcategorized inner locatives, we can find locative discontinuity and the syntactic asymmetry when one disconstituent is topicalized.

It has been suggested in the literature that inner and outer locatives are distinct roles. If this is the case then we would not expect the outer locative to be part of the locative discontinuity in the example in (17a), any more than we would expect the durative to be in (17b).

(17) a. John kept those two new books at the reference desk next to the dictionary in the library.
    b. John kept those two new books at the reference desk next to the dictionary for three hours.

We have seen that it is possible to topicalize the more general of the inner locatives. If the outer locative is a distinct role, we should still be able to topicalize the more general inner locative regardless of the presence of the outer locative. However, while it is possible to topicalize the outer locative, as in (18a), an outer locative in a VP adjoined position prevents the topicalization of the most general inner locative, as in (18b). In (18c), where we clearly have a separate role (a durative), then the more general inner locative can topicalize.

(18) a. In the library, John kept those two new books at the reference desk next to the dictionaries.
    b. *At the reference desk, John kept those two new books next to the dictionaries in the library. (ok if the PP is an NP modifier)
    c. At the reference desk, John kept those two new books next to the dictionaries for three weeks.

If, as has been suggested, inner and outer roles are distinct roles, then we have no explanation for why the presence of an outer locative prevents the topicalization of the most general inner locative. We would expect it to be as irrelevant as the durative phrase in (18c). If, on the other hand, these are all simply locatives, then an outer locative is more general than even the most general of the inner locatives, so the contrast in (18) is what we would expect.

The claim here is that inner and outer locatives are not distinct roles, but that they are both disconstituents of a single locative discontinuity as is schematically represented in (19).

(19) $X_1 \supset \ldots \supset X_i \supset \ldots \supset X_n$
     outer   inner

Some point, Xi, in the discontinuity determines the switch-over point for the outer to inner reading for the role. When a verb subcategorizes an inner locative, it requires that there be an Xi. That is, at some point in the discontinuity, there must be a locative of sufficient fine-grain to be interpreted as a location for the theme. Xi is determined based on plausibility for the particular theme, and as such, it varies with the choice of the theme. Consider the sentences in (20).

(20)　a.　The developer put the subdivision in Toronto.
　　　b.　?*The developer put his wallet in Toronto.
　　　c.　The developer put his wallet on the shelf.

While the locative "in Toronto" is an appropriate inner locative for a subdivision, it is not sufficiently fine-grained to be an appropriate inner locative for a wallet. "The shelf", on the other hand, is sufficiently fine-grained.

If there is a locative-discontinuity for a verb that subcategorizes an inner locative, some point is selected in the scale from the most general to the most specific location. This point divides locations for the theme from locations for the event. Once this point is selected, any further specific location is interpreted as an inner locative, and any more general locative is interpreted as an outer locative. Regardless of their status with respect to the inner versus outer distinction, they are all disconstituents of a single locative-discontinuity.

The preceding discussion shows that locative discontinuity transcends issues of subcategorization for PP locatives. It can apply to both subcategorized and non-subcategorized locatives. Locative discontinuity can also extend to bare NP locatives, where there can be no question that an argument is involved.

Verbs like "spray" and "load" are claimed to enter into a transitivity alternation usually referred to as the locative alternation (Rappaport, Laughren and Levin 1987, Rappaport and Levin 1988, Levin 1989). The locative alternation is illustrated in the examples in (21).

(21)　a.　John sprayed the wall with paint.
　　　b.　John sprayed paint on the wall.

For many speakers, when the locative is the direct object of the verb, it is interpreted as being "wholly" affected. That is, in the example in (21a), the wall must be covered with paint in order to use this sentence. When the location is a PP, as it is in (21b), it is possible to interpret it as being only partially affected. When the locative occurs in a PP, we can usually provide a finer-grained disconstituent, as in (22).

(22)　John sprayed paint on the wall along the baseboard.

We find the expected asymmetries:

(23)　a.　On the wall, John sprayed paint along the baseboard.
　　　b.　*Along the baseboard, John sprayed paint on the wall.

While it is possible to topicalize the more general locative, it is not possible to topicalize the more specific one.

Now let's consider examples where the locative is a direct object. Again, many speakers require that bare-NP locatives be interpreted as wholly affected. Within such a reading, we would not expect any further specification of a finer-grained disconstituent locative to be felicitous. If the location expressed by the object is wholly affected, then it would not be possible to further zoom in with a finer-grained, more specific location. While this is true for many speakers, there are some speakers that do not have as strong a requirement that the wall be wholly affected. As a result, we find some variation in the judgements of sentences like the one in (24).

(24)   John sprayed the wall with paint along the baseboard.

Of interest, even for those speakers that find examples in (24) acceptable, the topicalized alternative in (25) is not possible with an inner reading.

(25)   *Along the baseboard, John sprayed the wall with paint.

It is particularly interesting that the corresponding passive in (26) is judged significantly better than (25), again by speakers who do not require the wholly affected reading.

(26)   a.   Along the baseboard, the wall was sprayed with paint.

Again, these results are what we would expect. A finer-grained disconstituent cannot topicalize and adjoin to IP if there is a coarser-grained disconstituent inside the VP (the direct object in (25)). A finer-grained disconstituent can topicalize when the coarser-grained locative is the subject, since in this configuration there would be mutual m-command between the subject and the IP-adjoined topic.

Further support for this approach is found with locatives that alternate between a post-verbal PP and the subject. Consider the examples in (27), where we have the expected asymmetry with PP locatives.

(27)   a.   Ants are crawling in the kitchen under the sink.
        b.   In the kitchen, ants are crawling under the sink.
        c.   *Under the sink, ants are crawling in the kitchen.

(27a) has a near paraphrase in (28).[2]

(28)   The kitchen is crawling with ants under the sink.

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2.   Again there is some variation as to whether speakers require that the kitchen be wholly affected when it occurs as the subject, making the more specific locative PP infelicitous. The judgements here are based on speakers that do allow the more specific inner locative. Such speakers understand this sentence to mean that although the entire kitchen may crawling with ants, there is a preponderance of ants under the sink.

(29)   Under the sink, the kitchen is crawling with ants.

In fact, we find a symmetric relationship here since a topicalized PP and the subject are in a mutual m-command relationship.

(30)   In the kitchen, the sink is crawling with ants.[3]

Similarly, in (31) we find the same symmetry between the subject and the topicalized PP.

(31)   a.   In that apartment building, the basement is infested with roaches.
        b.   In the basement, that apartment building is infested with roaches.

Another type of example with a symmetric relationship between a subject and a topic is found with the predicate adjective construction, as in (32). (These sorts of examples seem to be subject to considerably less idiolectal variation than the alternating locative subjects and objects.)

(32)   a.   At the lakeshore, Toronto is beautiful.
        b.   In Toronto, the lakeshore is beautiful.

The interpretation of (32a) does not involve an assertion about the beauty of all of Toronto, but only asserts the beauty of Toronto at the particular location identified by "at the lakeshore". Here, and in all of the examples where we have a finer-grained topic together with a coarser-grained subject, the more specific topic forces a narrower interpretation of the subject.

So, in general, there is an asymmetric relationship between topicalized disconstituents and post-verbal (either VP internal or adjoined to VP) disconstituents, but a symmetric relationship among post-verbal disconstituents or between the subject and a topicalized disconstituent. This distributional asymmetry is captured by m-command, as stated in (6).

We have seen that not only is it possible for a role to be distributed across several syntactic constituents, but that this behaviour extends beyond the class of adjuncts. It applies to arguments as well.

In the next section, I show that thematic discontinuity extends beyond the sort of phenomenon that have been under discussion, and provides a solution to asymmetries that do not, at first, seem to involve discontinuity at all.

3.   Role Discontinuity: Cause

It has long been observed that there is a dependency between the agent role and the instrument role. Gruber (1965) points out that "the instrumental phrase cannot ordinarily be used without the subject being an agent". Similar observations have been made by Fillmore (1968), Nilsen (1973), Levin (1979), among others. It has also been

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3. This sentence loses the sense of *under* the sink.

observed that instruments can occur as subjects with certain verbs, as, for example, in the sentences in (33).

(33) a. John broke the vase with a hammer.
      b. A hammer broke the vase.

However, if the instrument is used as the subject, the agent must not be expressed. Typically these facts have been accounted for by appealing to a hierarchy of roles as candidates for subjecthood. The hierarchy stipulates that agent is higher than instrument. If there is both an agent and an instrument, the agent will be the subject, but in the absence of the agent, an instrument can be the subject. This characterizes the behaviour of these roles, but it is entirely stipulative and offers no real explanation.

To the sentences in (33), we can add sentences like those in (34) and (35).

(34) a. John broke the vase with a hammer.
      b. With a hammer, John broke the vase.

(35) a. The vase was broken by John with a hammer.
      b. The vase was broken with a hammer by John.
      c. *With a hammer, the vase was broken (by John).
      d. *By John, the vase was broken (with a hammer).

In (34), we see that it is possible to topicalize the instrumental PP. In the passive sentences in (35), we see that the instrumental and agent PP occur in free order post-verbally, but neither the instrumental nor the agent can topicalize.

All of these facts can readily be accommodated if we assume that agents and instruments are disconstituents of a single *cause* role, with the agent being the coarser-grained disconstituent.

(36) agent $\supset$ instrument (disconstituents of cause)

I follow Baker (1988) in assuming that the passive *-en* on the verb is an incorporated general expression of the cause role. This general cause inside the VP keeps the more specific agent and instrument from topicalizing (by the m-command requirement). The finer-grained cause (the instrument) can topicalize only if the coarser-grained cause (the agent) is the subject. No cause disconstituent can topicalize if there is a coarser-grained cause within the verb phrase. The subject hierarchy follows immediately from the structural prominence of the subject position, together with the m-command requirement on role-discontinuity.

Topographical subsetting is not the appropriate statement for the granularity of the cause role, as it was with locative-discontinuities. What seems to be at work here is the notion of *control* that was introduced in Levin (1979). For a cause-discontinuity, X1 is coarser-grained than X2 if X1 controls X2. This allows us to account for the unacceptability of (37).

(37) *Mary cut the meat with a knife with a saw.

The appropriate definition of the granularity of the cause role is not subsetting, as can be seen by the unacceptability of sentences like (38).

(38)   *Mary cut the meat with a tool with a saw.

Part-whole relationships do enter into the granularity of the cause role. Consider the sentences in (39).

(39)   a.   ?Mary cut the meat with a knife with the sharp edge.[4]
        b.   Mary cut the meat with a knife with the dull edge.
        c.   Mary cut the meat with a Swiss Army Knife with the small blade.
        d.   Mary wrote the letter with her left hand with a pen.

The judgements on these sentences are not as clear-cut, but there does seem to be a correlation between the unexpectedness of the more specific disconstituent and the acceptability of the sentence. If the part is unexpected (compare (39a) and (39b)) then it occurs more naturally in this sort of construction than does the more expected part. This suggests that the definition of the granularity of the cause role is somewhat more complicated than simply a chain of control. I leave the precise characterization for future research.

In (39d), then, there is a chain of control (together with a part-whole relationship): Mary controls her left hand which controls a pen. The grain of the cause role is represented schematically in (40).

(40)   (Mary) $\supset$ (her left hand) $\supset$ (a pen)

Further confirmation of this approach comes from limitations on topicalization with this sentence.

(41)   a.   *With a pen, Mary wrote the letter with her left hand.
        b.   With a pen, Mary wrote the letter.
        c.   With her left hand, Mary wrote the letter with a pen.

While it is possible to topicalize the instrument when there is no cause-disconstituent inside the VP (as in (41b)), it cannot topicalize if there is a coarser-grained cause in the VP (namely, "with her left hand" in (41a)). The coarser-grained "with" phrase can topicalize in (41c) since the coarsest-grained cause ("Mary") mutually m-commands the topicalized PP, and both of these asymmetrically m-command the finest-grained cause.

4.   Consequences and Conclusions

This approach to semantic roles has a number of desirable consequences. First, it captures the dependence between agents and instruments in a straightforward way.

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4. In these examples, we are abstracting away from the reading where the PP modifies the NP.

Instruments tend to co-occur with agents because they share a single role. This approach also derives, rather than stipulates, the subject selection hierarchy for agents and instruments. The instrument can be no higher in the structure than the agent by the m-command requirement on disconstituents. In the same way, limitations on topicalization are also accounted for. In addition, this approach allows us to reduce the inventory of roles by proposing fewer, more general roles. Inner and outer locatives are not distinct roles, but are disconstituents of a single locative role. Agent and instrument are not distinct role, but are disconstituents of a single cause role.

Finally, we have now characterized a principled middle ground between argument and adjunct. Instrumentals have long posed a problem for the argument-adjunct distinction. On the one hand, instruments are tied in to the meaning of the verb, suggesting that they are subcategorized (optionally) and hence arguments. They can even occur in typical argument positions. On the other hand, instrumental PPs are optional and they pattern with adjuncts in many of the tests for adjunct status.[5] Here we take the following approach: While structurally an instrumental PP is adjoined to VP, it shares a subcategorized role, the cause role, with an argument (namely, the agent). In this way, discontinuity allows us to characterize the middle ground between fully independent adjuncts and selected arguments.

References

Baker, M., 1988, *Incorporation: A Theory of Grammatical Function Changing*, University of Chicago Press, Chicago.

Brunson, B., 1992, *Thematic Discontinuity*, Ph.D. thesis, University of Toronto.

Chomsky, N., 1965, *Aspects of the Theory of Syntax*, MIT Press, Cambridge.

Chomsky, N., 1981, *Lectures on Government and Binding: The Pisa Lectures*, Foris, Dordrecht.

Fillmore, C., "The Case for Case". In E. Bach & R. Harms (eds.), *Universals in Linguistic Theory*, Holt, Reinhart and Winston, New York.

Gruber, G., 1976, *Lexical Structures in Syntax and Semantics*, North Holland Press, Amsterdam.

Halliday, M., 1970, "Language Structure and Language Function". In Lyons, J. (ed.), *New Horizons in Linguistics*, Penguin, Harmondsworth.

Levin, B., 1979, *Instrumental "With" and the Control Relation in English*, MIT AI Laboratory, Memo No. 552.

Nilsen, D., 1973, *The Instrumental Case in English: Syntactic and Semantic Considerations*, Mouton, The Hague.

Ostler, N., 1980, *A Theory of Case Linking and Agreement*, Indiana University Linguistics Club, Bloomington.

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5. For example, the instrumental patterns with the adjunct "on Tuesday" and not with the subcategorized PP "on the shelf" in the pseudo-cleft construction:

  i)   *What John did on the shelf was put the book.

  ii)   What John did on Tuesday was meet Mary.

  iii)   What John did with a knife was cut the bread.

Reinhart, T., 1981, "Definite NP Anaphora and C-Command Domains", *Linguistics Inquiry* 11.3.

Somers, H.L., 1987, *Valency and Case in Computational Linguistics*, Edinburgh University Press, Edinburgh.

Starosta, S., 1978, "The One-Per-Cent Solution". In Abraham, W. (ed.), *Valence, Semantic Case and Grammatical Relations*, John Benjamins Publishing Company, Amsterdam.