

CONTROL IN OBJECT-GAPPED PURPOSE INFINITIVE CONSTRUCTIONS*

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1. INTRODUCTION.

This paper offers a critical examination of the hypothesis that the control relation between filler and gap in sentences such as the following may be identified in the syntax by independently needed principles of Generalized Phrase Structure Grammar (GPSG).

- (1) Kim brought it_i to eat e_i on the trip.
- (2) The contract $_i$ was available to look at e_i in the attorney's office.

I suggest that the feature instantiation principles handling control (as in subject-verb agreement or filler-gap dependences in unbounded dependency constructions--UDCs) should not extend to the link between controller (filler) and gap in these object-gapped purpose infinitives (hereafter, OPCs--Object-gapped Purpose Constructions).¹

In Hukari and Levine (1987) we argue that purpose clause gaps should be grouped with missing object (*tough*) constructions

- (3) Sandy $_i$ is difficult to reason with e_i .

and *too/enough* optional object constructions,

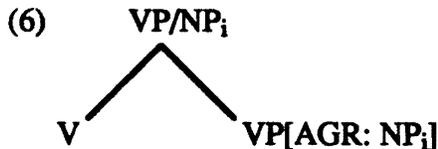
- (4) Leslie $_i$ is too tired/alert enough to talk to e_i .

all three to be treated as unbounded dependency constructions represented by a category-valued feature we named GAP, written as a double slash '/' and distinct from the GPSG unbounded dependency construction feature SLASH, found in such canonical unbounded dependency constructions as wh-question extractions. We argue there that the filler-gap linkage in such constructions should follow without stipulation from the independently-motivated control system in Gazdar, Klein, Pullum, and Sag (1985, henceforth GKPS).

Without going into our discussion in detail, I note here simply that the structural parallels between (3) and (4) above and the control system in GKPS as it pertains to subject extraction are striking. For example, subject gaps in interrogative constructions involve structure such as the following

- (5) Who do you [VP/NP $_i$ think [VP[AGR: NP $_i$] saw Kim]]

where the control principles recognize a link between the value of SLASH (that is, /NP $_i$) in mother VP/NP $_i$ and the agreement feature AGR in daughter VP[AGR: NP $_i$]. And SLASH percolates up the tree, ultimately linking with *who*.²



A similar connection is established in the following examples between AGR in A¹[AGR: NP_i] and GAP in VP//NP_i if GAP, like SLASH and AGR, is a control feature.

(7)[= (3)] Sandy_i is [A¹[AGR: NP_i] difficult [VP//NP_i to reason with e_i]].

(8) [= (4)] Leslie_i is [A¹[AGR: NP_i] too tired/alert enough [VP//NP_i to talk to e_i]].

And this parallel extends to purpose infinitives in passive contexts as well.

(9) The book_i was [VP[AGR: NP_i] bought [VP//NP_i to read e_i on the trip].

In these cases, it is AGR which percolates up the tree linking with the matrix subject, and the filler-gap linkage is established by the control system of GKPS simply by including GAP among the control features. Thus we find an interesting formal parallel between control in wh-extraction contexts and missing object constructions with non-local control as illustrated in the following diagrams.

(10) Subject Extraction: Missing Objects:

The inclusion of OPCs in the Hukari-Levine account of control in missing or optional object constructions seems reasonable in light of passives such as (9). However I wish to reassess this move in light of a fuller range of contexts, such as the following where the controller is local.

- (11) We gave Sandy a stuffed animal to play with e.
 (12) We gave a stuffed animal to Sandy to play with e.
 (13) The chef entrusted the potatoes to Kim to peel e for the stew.
 (14) The chef entrusted Kim with the potatoes to peel e for the stew.

It is such examples--in particular, cases involving more than one potential controller in the sense that the verb has more than one nonsubject argument--which lead me to suggest that control in OPCs falls outside the syntax.

The remainder of this paper develops two points which push me in this direction. First, the purpose infinitive may best be thought of as a modifier, not a complement--removing it from the typical GPSG control cases; and second, the identification of controller may crucially involve thematic relations, where the controller of the gap corresponds to the argument of the matrix verb which is construed as, essentially, a theme. It is far from obvious that thematic roles must be invoked in a theory of obligatory control structures, though numerous accounts of control (more narrowly construed than in GKPS) have invoked thematic roles (see for example Jackendoff, 1972, Nishigauchi, 1984, Sag and Pollard, ms.), but purpose infinitives may be exceptional in this respect.³

2. CONTROL AND SUBCATEGORIZATION.

In Hukari and Levine (1987) our position was that OPCs are optional complements and when the controller is present as sister to the gapped VP, control is parallel to *persuade* contexts.

(15) Kim [_{VP} bought it_i [_{VP/NP_i} to give e to her friends]].

(16) Kim [_{VP} persuaded Sandy_i [_{VP[AGR: NP_i]^{to}} sing]].

That is, in both cases the control feature of the infinitive VP (GAP, AGR) agrees with the controller sister (*it*, *Sandy*). This is based on the account of control given in GKPS, where essentially three cases emerge.

A. **The argument controls the functor.** In the structure [_{C₀} C₁ C₂], where C₂ is a predicative category, C₁ controls C₂ if the intensional logic (IL) type of C₂ is <TYP(C₁), TYP(C₀)>. This handles subject verb agreement (SVA) and control at the tops of UDCs as in the following diagrams.⁴

(17) a. SVA: b. UDCs:

B. **The next argument in.** In the structure [_{C₀} C_h ...C_i ... C_j ...] where C_h is the head and has the IL type <..., <C_j, <C_i, ...>...>, C_i controls a predicative category C_j. This handles cases such as *persuade* and, under the account in Hukari and Levine (1987), local control of OPCs.⁵

(18) a. b.

C. **Non-local control.** If a predicative category C_i has no controller, then its control feature agrees with that of the mother. This handles control of infinitives in *try* contexts, subject extraction as discussed above, as well as *tough* and *toofenough* gaps.

The relationship between subcategorization and control may not seem obvious, but the account works as follows. If a verb is subcategorized for OPCs, then it takes them as arguments in the semantics. So, for example, the type of *buy* in contexts where it takes an OPC is roughly <VP//NP, <NP, VP>>, and the object NP, as the next argument in after the OPC, controls the latter by case B above.

The hypothesis embodied in the Hukari-Levine analysis of (15) can be broken down into two parts: (a) the OPC is a sister of the controller and the lexical head and (b) the head is subcategorized for the OPC. For case B of control to be applicable, both conditions must be met. I turn to the evidence for subhypothesis (a), including OPCs in minimal VP, in section 3, concentrating on subhy-

pothesis (b), the matter of subcategorization, in the section two. But before turning to this, I should point out that (b) may not be essential. Hukari and Levine (in progress) make the conjecture that the control system can be simplified considerably by eliminating reference to IL types: a controllee (predicative category) is controlled by a nonhead sister (subsuming cases A and B) and, failing that, case C above applies. This purely configurational account of control has lexical exceptions. So for example, *promise* will be marked as an exception and case C applies. Under this account it is possible that OPC control is strictly configurational. It might still be necessary for the controller to be a sister, but subcategorization may not be at issue.

3. SUBCATEGORIZATION.

Returning to the question of subcategorization, Faraci (1974), Bach (1982) and Dowty (1982b) characterize the contexts supporting OPCs essentially in semantic terms.⁶ As Jones (1985a) puts it, the predicates supporting OPCs must have themes which "... must be at hand, available for some subsequent possible manipulation":

(19) OPC must be controlled by a (subsequently possible) Patient. [Jones, 1a.2]⁷

Jones argues that, given a semantic characterization of the contexts supporting OPCs is possible, then this should not be viewed as subcategorization, as a semantic characterization is generally not available in cases of subcategorization--compare, for example, *eat*, *dine*, *chew*, *devour*, each with its own distinct combinatorial possibilities despite their shared semantic similarities.

Green (forthcoming) takes a somewhat different position which leads to the same conclusion, that the contexts supporting OPCs should not be described by subcategorization. She presents evidence suggestive of pragmatic conditions. Starting with the assumption that a context supporting OPCs is one which "...asserts or entails possession or control of the entity corresponding to the gap by the inferred controller of the infinitive verb," she argues that entailment of possession or control may be inferred from context. Her example is the verb (*to*) *redline*, meaning to refuse to insure property in a given area. Given a context in which an insurance company redlines an area in order to buy investment property cheaply, she asserts one can say

(20) They redlined it to build high rises on t.

The critical point here being that the context--not the semantic meaning of the verb itself--entails that the company will have possession before the activity. The obvious conclusion to be drawn from this is that the class of verbs supporting OPCs is not enumerable by syntactic or semantic criteria. Hence her argument has more force than Jones', since he argues that the class of verbs should be defined semantically since a semantic definition is possible, whereas Green argues that the class of verbs cannot be defined wholly by subcategorization (or in the semantics, for that matter).

While Green's example seems plausible, I would be more comfortable with this line of argumentation if I could understand why the following does not seem to work out.

(21) If Kim touched anything, she gained ownership of it.

(22) Seeing a nice vase, she touched it to give e to her mother.

Seemingly a context from which one infers possession before the activity (i.e., of giving the vase to her mother) is perhaps a necessary but not a sufficient condition for a verb to support OPCs.

Both lines of argumentation (Jones' and Green's) merit further investigation, but if we take the evidence at face value, it suggests that the contexts supporting OPCs should not be defined by subcategorization.

Green suggests that OPCs are modifiers, but ones which appear in minimal (lexically headed) VP, licensed by a metarule along the following lines.

(23) [+V] → W, NP ⇒ [+V, PURP] → W, NP, VP//NP

The distinction between complement and modifier/adjunct may seem fuzzy at this point, but the introduction of OPCs via a metarule militates against lexical exception. OPCs then are sisters to the lexical head, but one might choose not to think of them as complements because the syntax says any transitive verb can take one. Insofar as verbs do not support OPCs, this would not be a fact of subcategorization and syntax, but something residing in the semantics or the semantic/pragmatic interface.

Whether the conditions determining contexts which support PCs are viewed as semantic or pragmatic constraints, the defectiveness of sentences (or corresponding utterances) such as (24) are then essentially on a par with (25) through (27), under the assumption that the italicized PPs in the latter are adjuncts.

- (24) Kim threw it away to take to school.
 (25) Kim knew the answer *with a sliderule*.
 (26) Sandy contains DNA *for her mother*.
 (27) Shelly is myopic *in Detroit*.

The speaker, in uttering (24) must believe that Kim's throwing something away constitutes an event which, in itself, makes the object available for a future event in which Kim (or possibly someone else) takes the object to school. But given what it means to throw something away, this scenario is just about as bizarre as a situation in which it makes sense to say *Sandy contains DNA for her mother*, where the speaker surely must believe that Sandy's containing DNA would not be so if Sandy had not brought about that state of affairs for the purpose of somehow benefitting her mother.

Another argument against treating OPCs as complements in the relevant sense is that it entails a proliferation of lexical ID rules.⁸ For most classes of verbs which take, among other things, an NP object, there will be members which also permit OPCs. So consider the following ID rules from GKPS.

- (28) VP → H[2], NP (*take*)
 (29) VP → H[3], NP, PP[to] (*send*)
 (30) VP → H[4], NP, PP[for] (*buy*)
 (31) VP → H[5], NP, NP (*buy*)
 (32) VP → H[6], NP, PP[+LOC] (*put*)

The verbs in parentheses to the right of the rules support OPCs, which means that for each of these rules there must be a corresponding one introducing OPCs. If, in fact, the contexts not supporting OPCs can be defined semantically, then Green's metarule makes more sense. And of course if the contexts can only be defined pragmatically, then subcategorization cannot offer an observationally adequate account.

In summary the control formalism in GKPS requires OPCs to be complements of verbs if these are to be controlled in turn by verb complements (see section 1 above). While this is what Hukari and Levine (1987) assume, we may distinguish between subcategorization, on one hand, and membership in lexical VP on the other. Hukari and Levine (in progress) suggest that local control in lexically headed contexts may be stated without an appeal to types. If so, complements of verbs may serve as controllers of OPCs even if OPCs themselves do not correspond to semantic arguments of these verbs. However the revisions in control envisaged would still require that the OPC and its controller be sisters, though I conclude section in the next section that this structural criterion is met. Thus the structure of OPCs may not in itself exclude them from the control theory.

4. CONSTITUENCY.

Tests for VP internal constituency are not, to my mind, particularly robust, though the evidence suggests that OPCs are in minimal VP. Faraci (1974) notes that OPCs, unlike purposive clauses (which optionally are prefaced by 'in order to') do not freely prepose. This is at least suggestive of the hypothesis that OPC are in minimal VP and hence available to control from verb complements, while purposive clauses are outside minimal VP.⁹

- (33) a. Kim gave it to Sandy to play with e on the train.
 b. *To play with e on the train, Kim gave it to Sandy.
 (34) a. Kim gave it to Sandy (in order) to appear generous.
 b. (In order) to appear generous, Kim gave it to Sandy.

And this is consistent with the contrast between purposives and OPCs in VP preposing (see Jones, 1985b).

- (35) Kim said she would give it to Sandy and give it to Sandy, she did in order to please her mother.
 (36) *Kim said she would give it to Sandy and give it to Sandy, she did to play with.
 (37) Give it to Sandy though Kim did in order to please her mother, she certainly didn't want to.
 (38) *Give it to Sandy though Kim did to play with, she certainly didn't want to.

The two constructions also contrast in pseudoclefts in a way consistent with the assumption that OPCs are in minimal VP while purposives are outside (see Jones, 1985b).

- (39) What Kim did (in order) to please her mother was give it to Sandy.
 (40) *What Kim did to play with was give it to Sandy.

Do so constructions show similar contrast.

- (41) Lee gave marshmallows to Sandy to please his mother and Kim did so to please her aunt.
 (42) *Lee gave marshmallows to Sandy to play with and Kim did so to eat.

And when OPCs and purposives co-occur, the former precede the latter, which is at least consistent with the hypotheses that OPCs are inside minimal VP and purposives are outside (see Faraci).

- (43) Kim gave it to Sandy to play with to please her mother.
 (44) *Kim gave it to Sandy to please her mother to play with.

Finally, as noted in Hukari and Levine, if OPCs are in minimal VP, this explains why they, unlike purposives, are accessible for wh-extraction.

(45) Who did Kim buy it/the ticket to send to?

(46)*Who did Kim buy it/the ticket (in order) to send e to China? (e.g., Kim bought the ticket in order to send Sandy to China.)

It is assumed in GPSG that the UDC feature SLASH is both a FOOT feature and a HEAD feature (see Sells, 1983). As a HEAD feature, SLASH must stay on the head path unless the head is lexical.¹⁰ This accounts for the fact that extraction from complements, such as subordinate clauses, is possible, but not from adverbial clauses.

(47) What does Kim think Sandy read e before she filed the notes?

(48)*What does Kim think Sandy read the notes before she filed e?

In conclusion, the evidence discussed so far by no means eliminates OPC control from the syntactic control system of GPSG. The OPC and verb complements may well be sisters, hence the OPC is accessible for control by the latter. And, as noted above, whether or not verbs are subcategorized for OPCs (thereby taking them as semantic arguments) will be immaterial if control theory does not invoke IL types. But I now turn to considerations which suggest that a syntactic treatment of control in these contexts may not be desirable even if such an account is feasible.

5. THEMES AND TRANSACTIONAL VERBS.

So long as we confine ourselves to simple transitive verbs, an account of control in OPC contexts seems unproblematic. Given that a transitive verb (pragmatically or semantically) supports OPCs, its object controls the gap. Supposing control in GPSG is as suggested above: the controller of a predicative category is a nonhead sister, then cases such as the following are accommodated even if OPCs are not treated as arguments of the verb.

(49) Kim bought it to give to her mother.

(50) Sandy made it to wear to the party.

But the following may be a problem if the OPC has two nonhead sisters.

(51) Lee bought it for Sandy to wear to the party.¹¹

(52) Sandy sent it to Lee to give to his mother.

We might assume that either the NP object or the PP could, in principle, control a predicative category but OPC gaps must be NPs, thus only the object counts as the controller.¹² As it turns out, speakers' judgments are split on this. Some reject PP controllers of OPCs while others accept them. I consider each case below. The case of speakers who accept PP controllers when they are themes--coupled with the peculiar fact that there is such variation among speakers--leads me to suggest that the filler-gap relation in OPCs falls outside a syntactic account of control.

6. STRICT NP CONTROL OF OPCS.

Speakers who reject PP controllers should find the following (a) sentences grammatical (subject to some individual variation as to subcategorization properties of the relevant verbs), but not the (b) sentences, as indicated here, where '#' indicates the examples are unacceptable for these speakers.

- (53) a. The school district provides them/cots to the children to lie on during their nap period.
 b.#The school district provides the children with them to lie on during their nap period.
 (54) a. The NRA presented them/capguns to him to give to young children.
 b.#The NRA presented him with them to give to young children.
 (55) a. His mother entrusted it/the python to him to look after on the trip.
 b.#His mother entrusted him with it to look after on the trip.

Suppose we say that somehow only an NP may control the OPC. Then the controller is the NP sister of the OPC, if any exists. In the corresponding passives of the (a) examples, there is no NP sister, so case C of control applies, correctly identifying the subject as the controller.

- (56) They are provided to the children to lie on during their nap period.
 (57) They were presented to him to give to young children.
 (58) It was entrusted to him to look after on the trip.

A problem with this approach arises when the verb phrase contains two noun phrases.

- (59) Sandy gave Kim Robo to play with.

Clearly only *Robo* can control the gap, yet *Kim* is also an NP sister to the infinitive VP. A possible move (following Green, ms.) is to say that control is semantically (or pragmatically) constrained: while either NP is a syntactic controller, *Kim* is filtered out by the semantics. This, in fact, is consistent with an account of the illformedness of the (b) examples in (53)-(55) above. The direct object is identified as the controller, but this violates a semantic constraint that the controller must be a theme.¹³

And the ungrammaticality of passive counterparts of the (b) examples is also predicted.

- (60) #The children are provided with them to lie on during their nap period.
 (61) #He was presented with them to give to young children.
 (62) #He was entrusted with it to look after on the trip.

Since PP is not a possible controller, case C of control applies and the matrix subject is identified as the controller, but these are caught by the semantic/pragmatic constraint that the controller must be the theme.

Therefore, so long as we confine our attention to speakers who reject PP controllers, as in the (b) examples, it seems possible to construct what amounts to a structural account of control in OPC contexts. While thematic roles come into play, they are not imported into the syntax.¹⁴

7. PP CONTROL IN OPCS.

A serious problem with this barring PP as a controller in OPCS arises when we are confronted with examples such as the following from Waksler (1984) and Kirkpatrick (1982), where the object of the preposition seems to be the controller.

- (63) I've been asking her for it for six months to use e in the lab. [Waksler (5)]
 (64) He supplied Marta with them to hand out e at the party. [Kirkpatrick (19a)]

There is considerable speaker variation as to the acceptability of (putative) PP controllers of OPCs, but some speakers accept (or even prefer) the PP-controller sentences in In (53)-(55) above, repeated here.

- (65) a. The school district provides them/cots to the children to lie on during their nap period.
 b. The school district provides the children with them to lie on during their nap period.
 (66) a. The NRA presented them/capguns to him to give to young children.
 b. The NRA presented him with them to give to young children.
 (67) a. His mother entrusted it/the python to him to look after on the trip.
 b. His mother entrusted him with it to look after on the trip.

For these speakers, it seems that either an NP or a PP controls the OPC, provided it is the theme.

Waksler, working within a LFG analysis, suggests that these controllers are actually 2-object noun phrases and that the verbs are complex (i.e., *ask-for*, *supply-with*). But it is not obvious to me how her proposal is to be implemented in light of the fact that the verb and the preposition are not adjacent. Further, contra her claims, pied piping is possible in most cases.¹⁵ (68b) is not very good

- (68) a. I have been asking for it to use in the lab.
 b. ?This is the device for which I have been asking to use e in the lab.

but I suspect the problem involves misparsing, since *ask* also subcategorizes for an infinitive complement, as in *I have been asking to use this device in the lab*. The following sentences are perhaps better, with the caveat that not all speakers accept the (a) examples, let alone the (b) examples.

- (69) a. He supplied Marta with them to hand e out at the meeting.
 b. These are the pamphlets with which he supplied Marta to hand e out at the meeting.
 (70) a. The stewardesses have provided the children with them to play with on the flight.
 b. These are the stuffed animals with which the stewardesses have provided the children to play with on the flight.

Thus it seems that, for some speakers, PPs can be construed as fillers of OPC gaps. This does not rule out a syntactic analysis of the filler-gap relation, though it makes the approach perhaps less credible than saying that the connection is semantic and that the theme, whatever its syntactic role, controls the gap. Note however that some EQUI contexts seemingly involve PP controllers, as in the following examples.

- (71) Kim appealed to Sandy to leave the party.¹⁶
 (72) We can rely on Kim to extricate himself from any problem.

So we cannot rule out in principle a control relation between a prepositional phrase and a control feature whose value is NP. (See the appendix for further discussion of how objects of prepositions may be made accessible as controllers.)

But if features of both the object of the verb and the object of the preposition are accessible in an account of OPC control, what tells us that the PP is the controller in (73) while the NP is the controller in (74)?

(73) Kim provided Sandy with books to read e on the trip.

(74) Kim provided books to Sandy to read e on the trip.

As it turns out, constructing a syntactic account of this difference is nontrivial. In fact, even an account which imports semantic argument structure (i.e., obliqueness as in Dowty, 1982a and b) runs into difficulties. Suppose we say that the controller is the most oblique NP-type argument of the verb. Under the assumption that the prepositions associated with themes are essentially grammatical markers (case-markers), we can assume they are specified for the feature PFORM and translate as NP-types (see GKPS). The following is an approximation of the condition.

(75) The controller of an OPC is a sister corresponding to the most oblique argument in the type structure of the translation of the lexical head.

So, for example, the head *entrust* will be type $\langle \tau(\text{NP}), \langle \tau(\text{NP}), \tau(\text{VP}) \rangle \rangle$ in (67b), where the first NP-type is the most oblique and corresponds to the translation of *with it*. Thus the PP should be the controller.

While this account looks possible, there are serious problems in implementing it in a GKPS-style grammar. The information available to the feature-instantiation system includes an immediate dominance rule

(76) $\text{VP} \rightarrow \text{H}[\#], \text{NP}, \text{PP}[\text{with}], \text{VP} // \text{NP}$

a local tree

(77)

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graph TD
  VP --> V
  VP --> NP1[NP]
  VP --> PP[PP[with]]
  VP --> NP2[NP//VP]
  
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and the type of the verb: $\langle \tau(\text{NP}), \langle \tau(\text{NP}), \tau(\text{VP}) \rangle \rangle$. The syntax does not have access to the translation schema and the IL representation, so we have no means of determining that the PP--not the NP--translates as the most oblique NP-type argument, that the IL representation is roughly

(78) *entrust*'(it')(him')(his-mother')

where the left-most argument is the most oblique. In short, the notion of obliqueness is not available in the syntax. There are of course a number of moves making such information accessible, such as employing a subcategorization list or 'stack' (see Pollard 1984, Pollard and Sag, 1987). Alternatively, grammatical relations might be encoded as features (see Zwicky, 1987).

But even if an obliqueness relation were available in the syntax, the condition that the controller must be the theme would somehow have to override control. Consider again the passive counterparts to (53)(a) through (55)(a) above.

(79) They are provided to the children to lie on during their nap period.

(80) They were presented to him to give to young children.

(81) It was entrusted to him to look after on the trip.

In each case the most oblique NP-type sister (the only NP-type sister) is the *to*-PP. The syntax then identifies this as the sole potential controller of the OPC and the semantics or pragmatics must filter it out because it is not a theme. But this incorrectly yields the result that the sentences should be unacceptable, whereas the subject should be interpreted as the controller. The notion of obliqueness seems to do no work here at all, and one might as well say that the controller of the OPC is the argument of the verb which is the theme.

A further reason for rejecting a type-based account of OPC control identifying the most oblique NP as controller is the fact that this offers no explanation for why the *to*-PP objects do not function as controllers, under the assumption that a *to*-PP is more oblique than the direct object (see Dowty, 1987).¹⁷

(82) John gave it to her_j to play with e_i*_j on the trip.

The moral here is that a syntactic account of these speakers' judgments needs access to the notion theme, but incorporating thematic roles into the syntax seems a dubious move at best (see, e.g., Dowty 1987).

In summary, syntactic accounts of OPC control are problematic. Further, grammaticality judgments vary considerably. Insofar as we can say that the theme (if anything) is identified as the controller, this may be a unique case in English where a thematic role is so instrumental (see Ladusaw and Dowty, 1988, and Jones, 1988). Rather than importing thematic roles into the syntax for this one case, it seems credible to assume instead that OPC control is outside the syntax. In fact, this move makes the variation in speakers' judgments perhaps more understandable.

NOTES

* This work was supported in part by Social Sciences and Humanities Research Council of Canada grant 410-88-0435 and a University of Victoria Faculty Research Grant. The author would like to thank Robert Levine and Sam Bayer for their comments on the paper, and numerous people for their grammaticality judgments.

¹The gap in such constructions may be the object of a preposition or a verb.

²Directionality actually plays no role in feature instantiation. So it is just as appropriate (or inappropriate) to say that SLASH works its way down the tree.

³I am assuming a much broader theory of control than one describing, for example, lexically governed EQUI contexts (e.g., *promise/persuade*), namely that proposed in GKPS. One might of course reach very different conclusions if control is construed differently from the domain set out in GKPS.

⁴The presentation here is highly informal and departs from GKPS in various respects for the sake of perspicuity. For example, linear order plays no role in the control system as defined in GKPS.

⁵As Green (ms) notes, the definitions in GKPS do not allow VP/NP (or VP//NP) to be a predicative category, which must be of type <NP, S>. Let us assume for the discussion that a predicative category is one containing SLASH or GAP inherited from an ID rule, or VP.

⁶Bach assumes that a very limited set of verbs, *have* and *be* are subcategorized for PCs. As to the others, both Bach and Dowty treat these as TVP (transitive VP) modifiers.

⁷I am not assuming a distinction between theme and patient. A very interesting point which I have not pursued here is the relationship between theme-controllers in this construction and Dowty's properties of proto-patients (Dowty, 1987).

⁸This argument is not tied to the treatment of subcategorization in GKPS, where subcategorization frames are eliminated from lexical entries, replaced by subcategorization indices linked to ID rules (as values for the feature SUBCAT associated with the head). If the lexicon contains subcategorization frames or perhaps a list-valued subcategorization feature as in Pollard (1984), there will be a proliferation of lexical entries not accounted for by rules.

⁹See also Browning (1987) for a review of the literature concerning the structure of OPCs as opposed to purposives.

¹⁰SLASH is prevented from entering lexical categories in GKPS by a feature cooccurrence restriction: [SUBCAT] \supset \neg [SLASH]. This overrides the Head Feature Convention, so the mother may contain SLASH when the head does not.

¹¹There may be two parsings for this example: one in which *for* is a complementizer and the intended one, where it is a preposition. Latter offers an explanation for the grammaticality of *Who did Lee buy it for to wear to the party?*

¹²There may be independent need to restrict the value of the feature GAP NP or S. Certainly these are the only two possible values in *tough* contexts:

- (i) That Sandy killed the duchess would be difficult to prove.
- (ii)*In the kitchen would be difficult to hide the letters.

I turn to examples below, however, where PP appears to control OPCs.

¹³Ditransitives are noted by Dowty (1982b), whose analysis extends Bach's (1982) by offering an account in the context of categorial grammar for (i) the following with *War and Peace* as the controller of the gap.

- i. John gave Mary *War and Peace* to read to the children. [Dowty (35)]

Apparently nothing in his analysis prevents *Mary* from being a possible gap-controller, thus his analysis also involves semantic/pragmatic filtering (as does Bach's).

¹⁴I do not address here the problem of excluding PP as a possible controller in OPC contexts. Though I see no problem in principle, this is bound to add an unwelcome addition to level of complexity in the control formalism.

¹⁵Waksler's examples are wh-questions. Pied piping improves, at least for me, in relative clauses.

¹⁶Sag and Pollard (ms.) give this example as well as

- (i) *It was decided by Bill to leave the party.*

While the latter seems relevant on the face of it, I am not convinced this is a normal case of control, as

(ii) *It was decided by Bill to behave himself*

is very odd, as opposed to

(iii) *Bill decided to behave himself.*

Perhaps a more normal interpretation of (i) is one in which Bill makes the decision for a group, not just himself.

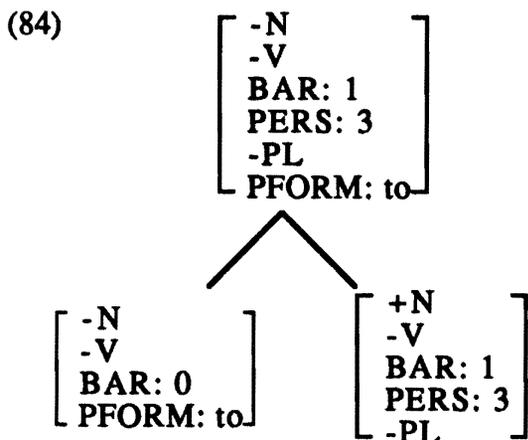
¹⁷Notice that bringing the OPC into the argument structure does nothing more than restate the problem. If we somehow say that dative *give* with an OPC is $\langle \tau(\text{to-PP}), \langle \tau(\text{VP//NP}), \langle \tau(\text{NP}), \tau(\text{VP}) \rangle \rangle \rangle$, it certainly is not obvious why the OPC is the next-to-last argument in, while it presumably would be the last argument in when *give* is ditransitive: $\langle \tau(\text{VP//NP}), \langle \tau(\text{NP}), \langle \tau(\text{NP}), \tau(\text{VP}) \rangle \rangle \rangle$. And, in any event, the problem of establishing a correspondence between controller and argument in the type structure of the head without recourse to IL representations still remains.

Appendix

I outline here a possible way of making objects of prepositions available as controllers under the usual assumption in GPSG that syntactic control involves feature matching. Suppose we say that the PPs in question involve 'case-marking' prepositions, which are treated in GPSG much as in LFG. In GKPS, case-marking prepositions are specified for a feature PFORM. Dative *to* is [PFORM: to], and we could perhaps treat thematic *with* and *for* as [PFORM: with] and [PFORM: for]. Then PPs form heterocategorial structures which are licensed by the following ID rule, where both the lexical preposition and the NP count as heads.

(83) $P^1[\text{PFORM } \alpha] \rightarrow H[\text{SUBCAT } \alpha], H^2[+\text{N}]$

Points where the heads and the mother differ in feature composition due to the ID rule or some feature cooccurrence restriction (FCR) are forgiven by the Head Feature Convention. The symbol 'P' in the rule abbreviates [-N] and [-V], and the lexical head (specified with SUBCAT) must agree with the mother, but the phrasal head is specified [+N] in the rule, thus it will be [+N] and [-V]. Similarly, differences in bar level follow from the rule or a FCR specifying that categories containing SUBCAT are bar-0. Judicious use of feature cooccurrence restrictions will permit appropriate NP head features for person, number and gender to percolate into prepositional categories provided they bear PFORM specification, yielding the tree below. This makes the NP head features accessible for the CAP, though it does not explain why a category mismatch (PP versus NP) is possible between filler and gap.



REFERENCES

- Bach, Emmon. (1982). "Purpose clauses and control." In Pauline Jacobson and Geoffrey K. Pullum (eds), *The nature of syntactic representation*. Dordrecht: Reidel, 35-57.
- Dowty, David. (1982a). "Grammatical relations and Montague Grammar." In Pauline Jacobson and Geoffrey K. Pullum (eds), *The nature of syntactic representation*. Dordrecht: Reidel, 79-130.
- Dowty, David. (1982b). "More on the categorial analysis of grammatical relations." In Annie Zaenen (ed.), *Subjects and other subjects*. Bloomington: Indiana University Linguistics Club, 115-153.
- Dowty, David. (1987). "Thematic proto-roles, subject selection, and lexical semantic defaults." Unpublished Linguistic Society of America Colloquium paper.
- Faraci, Robert. (1974). *Aspects of the grammar of infinitives and for phrases*. MIT Ph.D. dissertation.
- Gazdar, Gerald, Ewan Klein, Geoffrey K. Pullum, and Ivan Sag. (1985). *Generalized Phrase Structure Grammar*. Cambridge, Mass.: Harvard U. Press.
- Green, Georgia M. (1988). "Purpose infinitives and their relatives." Manuscript, Department of Linguistics, University of Illinois.
- Hukari, Thomas E. and Robert D. Levine. (1987). "Rethinking connectivity in unbounded dependency constructions." In Megan Crowhurst (ed.), *Proceedings of the West Coast Conference on Formal Linguistics 6*. Stanford: Stanford Linguistics Association, pp 91-102.
- Jackendoff, Ray (1972). *Semantic interpretation in generative grammar*. Cambridge, Mass.: MIT Press.
- Jones, Charles (1985a). "Agent, patient, and control into purpose clauses." In William H. Eilfort, Paul D. Kroeber, and Karen L. Peterson (eds), *Papers from the parasession on causatives and agentivity*, *Chicago Linguistic Society 21*, pp 105-119.

- Jones, Charles. (1985b). *Syntax and thematics of infinitival adjuncts*. University of Massachusetts, Amherst Ph.D. dissertation.
- Jones, Charles. (1988). "Thematic relations in control." In Wendy Wilkins (ed.), *Syntax and Semantics 21: Thematic Relations*. San Diego: Academic Press, pp 75-88.
- Kirkpatrick, Charles. (1982). "A note on purpose clauses." In *Proceedings of the West Coast Conference on Formal Linguistics 1*, 268-272.
- Ladusaw, William, and David Dowty. (1988). "Toward a nongrammatical account of thematic roles." In Wendy Wilkins (ed.), *Syntax and Semantics 21: Thematic Relations*. San Diego: Academic Press, pp 61-73.
- Nishigauchi, T. (1984). "Control and the thematic domain." *Language* 60, 215-250.
- Pollard, Carl. (1984). *Generalized phrase structure grammars, head grammars and natural languages*. Ph.D. dissertation, Stanford University.
- Pollard, Carl and Ivan Sag. (1987). *Information-based syntax and semantics, volume 1: fundamentals*. CSLI Lecture Note Series no. 13. Chicago: University of Chicago Press.
- Sag, Ivan and Carl Pollard. (1989). "A semantic theory of obligatory control." Unpublished ms, Stanford University and Carnegie Mellon University.
- Sells, Peter. (1983). "Thinking about foot features." Unpublished ms, Stanford University.
- Waksler, Rachele. (1984). "A syntactic analysis of the object gap in purpose clauses." In Mark Cobler, Susannah MacKaye, and Michael T. Wescoat, *Proceedings of the West Coast Conference on Formal Linguistics 3*. Stanford: Stanford Linguistics Association.
- Zwicky, Arnold M. (1987). "Slashes in the passive." *Linguistics* 25, 639-669.

