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English prepositional passives in HPSG

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Abstract

This paper provides a detailed syntactic description of English prepositional passives (also known as "pseudopassives") and discusses their formal treatment in HPSG. The empirical overview includes a discussion of the familiar (but unformalizable) notion of semantic cohesiveness, as well as new observations about the possibility of elements intervening between V and P. Two formal approaches to the syntactic aspects of the problem are then outlined and compared—one relying on lexical rules, the other taking advantage of HPSG's capacity to express constraints on constructions.

Keywords PSEUDOPASSIVES, PREPOSITIONS, ADJUNCTS, HPSG, LEXICAL RULES, CONSTRUCTIONS

13.1 Empirical observations

English has an exceptionally rich variety of preposition stranding phenomena, perhaps the most striking of which is the prepositional passive—the possibility of passivizing the object of a preposition instead of the direct object of a verb.

(24) a. You can rely [on David] to do get the job done.
b. David$_i$ can be relied on t_i to get the job done.

Here the NP *David*, initially the complement of *on*, is realized as the subject of the passive verb *relied*, leaving the preposition behind.[1]

It is often suggested that the underlined verb and preposition in this construction form a kind of "compound", an intuitive notion that is open to many

[1] I will occasionally use the symbol "*t*" to mark the "deep" position of the passive subject, in cases where there might be ambiguity. This is deliberately reminiscent of NP-trace in transformational analyses, but here it should be understood only as a expository device with no theoretical strings attached.

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formal interpretations. I will begin by presenting some attempts to characterize the phenomenon in semantic terms, before turning to the syntactic aspects of the structure, which will be the main focus of the rest of the paper.

13.1.1 Semantic cohesion

One semantic approach that dates back at least to the classic descriptions of Poutsma and Jespersen is the idea that the prepositional passive is possible if there is a high degree of "cohesion" between V and P. Variants of this position can be found in modern grammars (e.g., Quirk et al., 1985) and in theoretical work on preposition stranding phenomena (see Hornstein and Weinberg (1981), who propose that V and P must form a "natural predicate" or a "possible semantic word"). The most accessible indicator of semantic cohesion is the possibility of replacing the V+P sequence by a single-word synonym:

(25) David can be relied on ⇝ trusted to get the job done.

But this criterion can easily be shown to be unreliable indicator of passivizability. In particular, many perfectly natural-sounding prepositional passives have no appropriate corresponding one-word synonym (26). Conversely, replacing an ordinary passivized transitive verb by a synonymous V+P combination often produces a degraded result (27), although as discussed below, I do not consider such prepositional passives to be syntactically ill-formed.

(26) That bridge is too low to be sailed under/*undersailed/*underpassed/*undergone.

(27) a. I was approached (by a complete stranger).
b. ??I was moved/come/walked towards (by a stranger).

It has also been observed that V+P sequences with abstract, transferred, or metaphorical meaning are more cohesive (i.e., they are more likely to allow the prepositional passive) than concrete, literal uses of the same sequence:

(28) a. An acceptable compromise was finally arrived at.
b. ??A picturesque mountain village was finally arrived at.

The difference in acceptability between these two examples must be due to non-syntactic factors, since under normal assumptions they receive identical syntactic analyses. Similarly, semantically non-compositional and idiomatic V+P combinations should be expected to be more cohesive and give rise to good prepositional passives, and this is generally the case. The usefulness of these observations for the current study is limited, however, because prepositional passives formed from fully compositional, concrete V+P sequences are generally grammatical, too. They may have relatively degraded acceptability as isolated examples, like (28b), or they can be completely unproblematic, like (26).

Other authors have attempted to approach the prepositional passive by looking at the semantic properties of the targeted oblique NP. Bolinger (1977, 1978) proposes that this NP can become the passive subject if it refers to a strongly "affected" patient. As Riddle and Sheintuch (1983) note, no satisfactory definition is provided for this "dangerously wide" notion, and it is easy to find examples of grammatical prepositional passives where affectedness is not involved. Their own functional account (relying on the notion of "role prominence") is equally vague.[2]

Cohesion and affectedness are of course gradient properties, and they can no doubt be decomposed into more primitive, interacting factors. For example, modality, tense, and negation have all been found to influence the acceptability of the prepositional passive. Furthermore, examples that are dubious in isolation can always be improved with an enlarged context.

In this paper I make the simplifying assumption that any V+PP combination can give rise to a *syntactically* well-formed prepositional passive. The acceptability of the resulting structure, however, is conditioned by non-syntactic restrictions that are not well enough understood to be incorporated into a formal analysis. Existing semantic accounts may be intuitively appealing but they lack a precise, empirical basis, especially if we take into account the predominant role of context. It is also clear that more or less idiosyncratic lexical properties associated with specific V+P combinations are a major determining factor in the acceptability of the prepositional passive; I will abstract away from such considerations in the following, primarily syntactic discussion.

13.1.2 Adjacency

A directly observable sign that V and P form a kind of "compound" in prepositional passive constructions is the fact that the insertion of adverbs and other material between V and P is generally disallowed, whereas various kinds of intervening elements are possible between V and PP in the corresponding active structure:

(29) We rely increasingly [on David] $\rightsquigarrow$ *David is relied increasingly on.

This evidence suggests a constraint on syntactic structure and/or surface word order.[3] This restriction could be formalized by introducing a word order constraint requiring V and P to be adjacent in the passive case, but for various reasons this approach would be inadequate.

[2] They themselves note that it is "impossible to offer an algorithm for determining what causes some entity or concept to be viewed as role prominent."

[3] Note that preposition stranding by extraction is much freer in this respect (although there are restrictions, probably of a prosodic nature):

(i) We rely increasingly [on David] $\rightsquigarrow$ Who do we rely increasingly on?

The specifier *right*, for instance, is possible with some spatial and temporal Ps:[4]

(30) Mr. Cellophane may be looked right through, walked right by and never acknowledged by those who have the audacity to suppose that they cannot be looked right through.

Similar examples can be found with other PP specifiers (*straight*, *clear*, etc.), so this is not a lexical idiosyncrasy of the word *right*. And in fact, in cases like these, where the preposition has clear relational meaning, a wider variety of modifiers can (quite marginally) appear between V and P in the passive:

(31) The bridge must be ??walked halfway across, ??sailed completely under, or ??driven quickly over (for the point to be awarded).

Unlike PP specifiers, which must appear immediately the left of P, the placement of the modifiers in this example is clearly "non-optimal", since they could also appear after P instead, leaving V and P adjacent. There are obviously semantic factors at work here that need to be explored further. From a syntactic point of view, adjacency of V and P is not a strict requirement; I will assume in this paper, in particular, that P can combine with a specifier or a modifier to its left.

Nominal elements can also separate V and P in the prepositional passive. It is well known that passives can be formed from some fixed expressions and light verb constructions containing a bare N or full NP:

(32) a. We were opened fire on, made fools of, paid attention to, taken unfair advantage of.

b. ?That product can't be made a profit from.

The commonly accepted assumption is that ordinary NP objects cannot appear between V and P, and the prepositional passive is indeed quite bad in most examples of this type:[5]

(33) Samuel explained a complicated theorem to David. $\rightsquigarrow$??David was explained a complicated theorem to.

A richer context can significantly improve such examples, however, and some examples of the same structure [V NP P] are unexpectedly good even with minimal context:

[4] This example is from a letter to the editor of the *Bradford Telegraph & Argus* (5 June 2003), referring to lyrics from a song: "Mr. Cellophane shoulda been my name, 'cause you can look right though me, walk right by me, and never know I'm there."

[5] Again, the contrast with extraction constructions is striking:

(i) Samuel explained a complicated theorem to David. $\rightsquigarrow$ Who did Samuel explain a complicated theorem to?

(34) ?[To be whispered such dirty innuendoes about] would be enough to drive anyone crazy.

According to Bolinger (1977, 1978), the underlined direct object in this sentence functions as part of the predicate, and the passive subject (left unexpressed here) is strongly "affected" by being whispered-dirty-innuendoes-about. Another proposal by Ziv and Sheintuch (1981) requires such intervening direct objects to be "non-referential". This is a reasonable characterization of the idiomatic examples in (32), but in order to accommodate cases like (34), the authors are forced to broaden the commonly understood notion of non-referentiality considerably, and to admit that it is "not a discrete property". In the end, the acceptability of this kind of prepositional passive (and of all prepositional passives, for that matter) depends primarily on context, and on usage and frequency effects associated with specific lexical items (or combinations of lexical items).

What is clear is that there can be no strict structural constraint against the presence of a direct object in the prepositional passive construction (e.g., an adjacency condition). We can also demonstrate that the ungrammaticality of the prepositional passive in cases like (33) is not due to the linear position of the direct object (between V and P). Even if the object is realized in a different position, making V and P adjacent, the prepositional passive does not become more acceptable. On the contrary, the passive examples below, with V adjacent to P, are worse than example (33) above, with intervening NP:

(35) a. Samuel explained to David [a fantastically complicated theorem about the price of cheese]. (heavy NP shift)

b. *David$_i$ was explained to t_i [a fantastically complicated theorem about the price of cheese].

(36) a. the theorem that Samuel explained to David / Which theorem did Samuel explain to David? (extraction)

b. *the theorem that David$_i$ was explained to t_i / *Which theorem was David$_i$ explained to t_i?

Furthermore, in cases like (32), where an intervening direct object is unproblematic, there appears to be a sort of "anti-adjacency" condition on V and P. Although the direct object can be realized in various positions in the active voice, in the prepositional passive it *must* appear between V and P:

(37) a. the unfair advantage that [they took of us] / How much advantage did they take of us? (extraction)

b. *the unfair advantage that [we were taken of] / *How much advantage were we taken of?

(38) a. We could make from this product [the kinds of profits that no one has ever dreamed of] (heavy NP shift)

b. *This product$_i$ could be made from t_i [the kinds of profits that no one has ever dreamed of].

Based on these observations, I make the following assumptions for the remainder of this paper:

- The prepositional passive is syntactically compatible with the presence of a direct object.
- The direct object must be realized in its canonical position between V and P.
- The acceptability of the prepositional passive is ultimately determined by non-syntactic factors that (for now) resist formalization.

To my knowledge, only one other kind of element can intervene between V and P in the prepositional passive: When a phrasal verb is involved, its particle must appear in this position:

(39) a. This situation will simply have to be put up with *t*.

b. The loss in speed can be made up for *t* by an increase in volume.

This is unsurprising, given the strong restrictions on particle placement in English. In the active voice, the particle must be realized closest to the verb (in the absence of a direct object); this constraint continues to apply in the passive.[6]

13.1.3 Further observations

Most of the examples given so far involve passive subjects originating in complement PPs, but it is clear that prepositional passives can also be formed from [V + adjunct PP] structures:

(40) a. This bed has not been slept in.

b. David always takes that seat in the corner because he hates being sat next to.

The most common sources are temporal and locative modifiers, but we also find other PPs, like instrumental *with*-phrases. Again, I will not attempt to identify or formalize the relevant semantic and lexical constraints. For the

[6]Examples of verbs selecting a particle, a direct object, and a PP at the same time show that the relative order of the particle and the object remains the same in the active and in the prepositional passive:

(i) a. They kept an eye out for David. ⇝ David was kept an eye out for.

b. *They kept out an eye for David. ⇝ *David was kept out an eye for.

moment, I simply note that the possibility of passivizing out of adjuncts constitutes a crucial difference between the prepositional passive and the ordinary passive. [7]

We might also wonder if there is any difference between the two passives in terms of their morphological effects, given that they target different (but overlapping) sets of verbs. In particular, the prepositional passive applies to intransitive verbs like *sleep* or *go*, and to prepositional verbs like *rely*, which never undergo ordinary passivization. For verbs that do participate in both types of passivization, we might ask if two distinct morphological operations can be identified. In fact, there is no evidence for this. In every case, the same participial form is used in both constructions:

(41) a. The pilot flew the airplane under the bridge. ⇝ The airplane was flown *t* under the bridge. (ordinary passive)

b. The pilot flew under the bridge. ⇝ The bridge was flown under *t*. (prepositional passive)

It is not the case that (say) a strong participle *flown* is used for the ordinary passive, while a weak form **flied* is used in the prepositional passive. Both passives require a form of the verb identical to the past participle.[8]

Finally, I briefly discuss the formation of deverbal adjectives from passive V+P sequences:

(42) a. our effective, relied-upon marketing strategy

b. a first novel from an as yet unheard-of author

This is sometimes taken as an additional argument for "cohesion" between V and P in the prepositional passive. For example, Hornstein and Weinberg (1981) use it to motivate the semantic notion of "possible word". It is unclear, however, what these adjectives can tell us about the passive structures they derive from, since they are evidently subject to additional constraints. Not all prepositional passives can be used to derive prenominal adjectives:

(43) a. ??a sailed-under bridge, *a sat-beside grouch

[7] NP adjuncts, for any number of reasons, cannot passivize like direct objects:

(i) The children slept three hours. ⇝ *Three hours were slept (by the children).

[8] One apparent counterexample is the following pair:

(i) a. They laid the sleeping child on the rug. ⇝ The child was laid *t* on the rug.

b. The child lay on the rug. ⇝ ?The rug was lain/laid on *t* by the child.

Here is looks as if a single verb can have a special participial form *lain* in the prepositional passive. But in fact two distinct verbs are involved in these examples: transitive *lay* (with past participle *laid*) vs intransitive *lie* (past participle ?*lain*/*laid*). This pair causes confusion and hesitation for most speakers in the past and perfect. It is safe to say, however, that no speaker merges the two into a single verb while maintaining distinct passive forms as in (41).

b. *a taken unfair advantage of partner, *an opened fire upon enemy camp

c. ??a put-up-with situation, ??a made-up-for loss

Some of these examples could be improved with more context, but they all clearly have a degraded status with respect to their fully acceptable verbal counterparts. This is particularly true for the examples with an NP or particle intervening between V and P. The data suggest strongly that adjectival derivation is not a truly productive process, but is more or less lexicalized on a case by case basis. This could perhaps be accounted for with a usage-based model, but I will not pursue this idea any further here.

13.2 Implications for an HPSG analysis

13.2.1 Modularity

The normal passive construction (with the direct object NP "promoted" to subject) is standardly handled as a lexical phenomenon in HPSG, either using a lexical rule deriving the passive participle from an active base verb (Pollard and Sag, 1987), or by assuming an underspecified verbal lexeme that can be resolved to either an active or a passive form with the appropriate linking constraints (Davis and Koenig, 2000).

A number of other approaches can be imagined and technically implemented within the framework, although they have never been seriously explored. For example, passive verbs could have the same syntactic valence as active verbs, if new syntactic combination schemas were added that realized their COMPS element (direct object) in subject position and their SUBJ element as a coindexed *by*-phrase. This analysis assumes a different division of labor between lexical information and syntactic operations, but it does not seem to present any advantages in return for the additional complexity it introduces.

A more radical solution would be to approximate the old transformational analysis within HPSG. A recent trend in the framework (most fully developed in Ginzburg and Sag (2001)) is the use of constructional constraints, a departure from the original emphasis (perhaps over-emphasis) on lexical descriptions as the driving force behind syntactic derivation. One characteristic of the constructional approach is a reliance on nonbranching ("head-only") syntactic rules. Such rules can potentially be used to encode arbitrarily abstract syntactic operations, from a simple change of bar level (e.g., X^0 to XP), to a coercion of one syntactic category into another (e.g., S to NP), or in our case, even the transformation of an active clause into a passive clause.

This last proposal would be soundly rejected by linguists working in HPSG, for violating various well-motivated locality and modularity principles. In particular, a syntactic rule should not be able to refer to or arbitrarily modify the phonological, morphological, or internal syntactic structure of the

constituents it manipulates. The proposed non-branching passive transformation rule would have to do all of the above. The problem is that these locality and modularity principles cannot be formally enforced in HPSG; they have the status of conceptual guidelines that responsible practitioners of the theory agree to follow by convention. Of course, this is a fundamental issue that is relevant for all grammatical frameworks, and rarely addressed. But the "all-in-one" sign-based architecture that constitutes the principal strength of HPSG, also makes it particularly easy to fall afoul of these basic principles. In the case of the passive, a constraint requiring non-branching rules to leave the PHONOLOGY and MORPHOLOGY values unchanged would be enough to invalidate the undesirable transformational analysis. But this is nothing more than an artificial stipulation, covering only a small subset of cases, and the more general theoretical question remains.

13.2.2 Adjunct analyses

For the ordinary passive construction, a strictly lexical analysis is available, because it only needs to refer to the subject and direct object, both of which are present in the lexically defined "argument structure" (encoded in the ARG-ST list). The fact that PP adjuncts can be involved in prepositional passives (recall the examples in (40)), however, makes a lexical approach to the phenomenon more problematic. This is because information about the identity of eventual adjuncts is not normally available at the lexical level, at least not according to the original assumptions of HPSG. A technical work-around to this problem is possible, in the form of the DEPENDENTS list of Bouma et al. (2001). This list, whose value is defined as the lexical ARG-ST extended by zero or more (underspecified) adjuncts, was introduced in order to allow a uniformly head-driven analysis of extraction from complement and adjunct positions.

This result is made possible basically by treating some adjuncts as complements, from a syntactic point of view. This reverses the direction of selection in adjunct structures: The head now selects these adjuncts, in complete contrast to the treatment of adjuncts in Pollard and Sag (1994). This move potentially introduces significant problems for semantic composition. Levine (2003) discusses a problem involving adjuncts scoping over coordinated structures, and argues for a return to the earlier HPSG approach, with adjuncts introduced at the appropriate places in the syntactic derivation (perhaps as empty elements, if they are extracted). Sag (2005) offers a response, requiring modifications to the proposal by Bouma et al. but maintaining the treatment of certain adjuncts as elements selected lexically by the head (and a traceless analysis of extraction).

$$\left[\begin{array}{ll}\textsc{head} & \left[\textsc{vform} \quad \textit{base}\right] \\ \textsc{deps} & \left\langle \mathrm{NP}_i, \boxed{1}\,(\mathrm{Prt} \vee \mathrm{NP}[\textit{canon}]), \mathrm{PP}\right\rangle \oplus \boxed{2}\end{array}\right] \mapsto$$

$$\left[\begin{array}{ll}\textsc{head} & \left[\textsc{vform} \quad \textit{passive}\right] \\ \textsc{deps} & \left\langle \mathrm{NP}_j, \boxed{1}, \mathrm{P}\left[\textsc{comps} \quad \left\langle \mathrm{NP}_j \right\rangle\right]\right\rangle \oplus \boxed{2} \oplus \left\langle \mathrm{PP}_i[\textit{by}]\right\rangle\end{array}\right]$$

FIGURE 1 Prepositional Passive LR

13.2.3 Prepositional passive: lexical approach

In light of this active controversy, any phenomenon involving adjuncts can be approached in two very different ways in HPSG. At first sight, the adjuncts-as-complements approach seems more appropriate for the prepositional passive, precisely because it targets complement and adjunct PPs in the same way. The lexical rule in Figure 1 takes as input a base form (active voice) verb with a PP on its DEPS list and outputs a passive participle with a DEPS specification custom-built to generate the prepositional passive: The first element on DEPS is the subject, followed optionally by a particle or a direct object.[9] The direct object, if present, is constrained to be canonical, to account for the data in (37–38) above. (An extracted or extraposed/shifted phrases would correspond instead to a non-canonical subtype of *synsem*.) The crucial operation in this lexical rule is the replacement of a saturated PP (complement or adjunct) in the input by a COMPS-unsaturated P in the output description. The unrealized complement of the preposition is coindexed with the passive subject NP, and the original subject is optionally realized in a *by*-phrase, as in the ordinary passive construction.

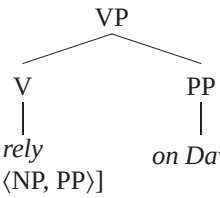
The complexity and ad hoc nature of this rule is perhaps forgivable, given the highly exceptional status of the phenomenon it models. On the other hand, the proposal fails to capture what is common to the prepositional passive and the ordinary passive. In fact, most aspects of the prepositional passive could be handled by the existing rule for the ordinary passive, which already provides a mechanism for: promoting a non-subject NP to subject position, demoting the subject NP to an optional *by*-phrase, and ensuring the appropriate morphological effects (identical for both kinds of passive, as confirmed in §13.1.3). For this to work, the NP complement of P must be made available directly on the DEPS list of the base verb (by applying argument raising, familiar from HPSG analyses of French and German non-finite constructions[10]) so

[9] This simplified formulation does not accommodate structures containing both a particle and an object (recall fn. 6).

[10] E.g., Hinrichs and Nakazawa (1994) and Abeillé et al. (1998).

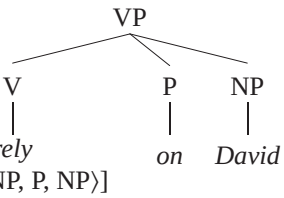
it can be input to the general passive rule. But this means introducing a systematic ambiguity between the sublists ⟨PP⟩ and ⟨P, NP⟩ in the DEPS value of the active form of the verb, giving rise to two structures:

(44) a.



[DEPS ⟨NP, PP⟩]

b.



[DEPS ⟨NP, P, NP⟩]

The unwanted analysis (44b) should be blocked, although we need this version of the verb *rely* in order to generate the prepositional passive *was relied on*. One straightforward way to achieve this would be to add the specification *non-canonical* to the second NP element on the verb's DEPS list. This would make it impossible for it to be realized as a complement, as in (44b), but we would still have spurious ambiguity in extraction constructions (where the NP is in fact non-canonical). A more adequate solution would be to enrich the hierarchy of *synsem* subtypes to encode the syntactic function of the corresponding phrase. This would then allow us to state the appropriate constraint (e.g., "¬*comps-synsem*").[11]

This analysis of the prepositional passive is still incomplete, because the insertion of intervening modifiers between V and P must be restricted; recall the discussion of example (29). The lexical operations proposed so far manipulate the DEPS list, a rather abstract level of representation that cannot be used to express constraints on surface word order. The required constraints therefore have to be formulated separately.

13.2.4 Prepositional passive: syntactic approach

A more radical treatment can be developed for the prepositional passive by combining the earlier HPSG approach to adjuncts (as unselected elements introduced in the syntax) and the more recent trend of constructional analysis.

Figure 2 sketches a special head-adjunct rule that can be used to construct the adjunct-based examples in (40). As in an ordinary head-adjunct phrase, semantic composition is handled via MOD selection. But this rule is extraordinary in that it requires the adjunct to be COMPS-unsaturated, and it specifies the coindexation of the unrealized complement of P and the as-yet-unrealized subject of the resulting VP. The rule also imposes special constraints on the head daughter. The sign type *core-vp* is defined to be compatible with a bare V, or a combination of V with a particle and/or a direct object. In other words, as soon as a verb combines with a non-nominal complement or any kind of

[11] This can be thought of as a very weak kind of inside-out constraint (as used in LFG, and reinterpreted for HPSG by Koenig (1999)).

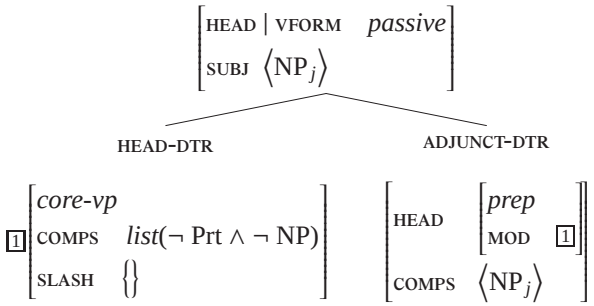


FIGURE 2 Constructional rule for adjunct prepositional passives

modifier, the resulting phrase is no longer a *core-vp*. This constraint (which constitutes a minor violation of locality principles) determines what can and cannot intervene between V and P in the prepositional passive, as discussed in §13.1.2 The negative constraint on the head daughter's COMPS list and the empty SLASH specification ensure that the particle and object (if any) are actually realized within the *core-vp*.[12] There is no particular constraint on the internal structure of the adjunct daughter: It can be either a bare preposition, or a phrasal projection including a specifier or a modifier.

A number of additional details need to be worked out; in particular, some aspects of passivization (e.g., morphological effects) must still be dealt with at the lexical level. It should also be noted that a similar special version of the head-complement rule is needed for prepositional passives involving PP complements, although it is possible to factor out the shared aspects of the two constructional rules; this is precisely the advantage of the hierarchical approach to constructions in HPSG. These preliminary observations suggest that the constructional treatment provides a more satisfactory account of the phenomenon than the lexical approach. Additional questions for further work include a comparison with the prepositional passive in Scandinavian, and a search for similar phenomena anywhere outside of the Germanic family.

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[12]This presupposes a return to syntactic SLASH amalgamation, as in the original HPSG Nonlocal Feature Principle.

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