An HPSG Approach to the *who/whom* Puzzle

Takafumi Maekawa
University of Essex

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Abstract

Order domains were originally proposed to deal with constituent order, but have recently been concerned with more than just linearization. This paper seeks to contribute to this discussion by considering the possibility of analysing word forms in terms of order domains. We focus on the distribution of the English relative and interrogative pronouns *who* and *whom*. It is shown that a small number of constraints can accommodate the seemingly complex body of data. In particular, a linearization-based constraint can provide a straightforward account for the quite puzzling distribution which *who* and *whom* show in one of the register types.

1 Introduction

Within Head-Driven Phrase Structure Grammar (henceforth, HPSG), recent years have seen the emergence of a view in which linear order is independent to a considerable extent from constituency and is analysed in terms of a separate level of 'order domains'.[*] This approach has begun to provide promising analyses of a variety of linearization phenomena (e.g., Pollard et al. 1994; Reape 1994; and Kathol 2000). More recently, order domains have been concerned with more than just linearization: e.g., Yatabe (2001; semantic composition), Borsley (2005; Welsh agreement), Yoshimoto (2000, 2003; phonology), Jaeger (2003) and Maekawa (2004; information structure). In this paper we would like to contribute to this discussion by considering the possibility of analysing certain word forms in terms of order domains. The empirical domain which we will be focusing on is the English interrogative/relative pronouns *who* and *whom*.

It has been traditionally accepted as a prescriptive rule that *who* is the form for a subject and subject complement and *whom* is the form for a verbal or prepositional object. This rule would require that *who* should be employed in the following sentences.

[*] I would like to thank Bob Borsley for his valuable comments and discussions. Thanks are also due to the participants at HPSG 2005 for their feedback and discussions. I am also grateful to three anonymous reviewers for HPSG 2005 and the participants at the Constraint Based Linguistics in the South of England meeting on 1 April 2005 at University of Essex for their comments and discussions on earlier versions of this paper. Any shortcomings are my responsibility. I gratefully acknowledge the generous financial assistance from the Department of Language and Linguistics, University of Essex.

(1) a. *Who*/**whom* wrote the editorial?
b. the man *who*/**whom* came to dinner

In (1) *who* is a subject of the following finite verb, and therefore *whom* is prohibited. The prescriptive rule would also require the occurrence of *who* in the following examples.

(2) a. We feed children *who/*whom* we think are hungry.
b. the man *who/*whom* I believe has left.
c. the man *who/*whom* it was believed had left.

In (2) *who* is a subject of the lower clause, so *whom* is excluded.

With regard to non-subject positions, however, there is an alternation between *who* and *whom*. As illustrated by the following examples, *whom* alternates with *who* as object of a verb or preposition in main clauses (3), embedded clauses (4), and in situ (5). The prescriptive rule would predict the occurrence of *whom*, not *who*, in these contexts.

(3) a. those *whom*/*who* we consulted.
b. someone *whom*/*who* we can rely on
c. He didn't say *whom*/*who* he had invited.

(4) a. *Whom*/*who* did you meet?
b. *Whom*/*who* are you referring to?

(5) a. Who will marry *whom*/*who*?
b. Who is buying a gift for *whom*/*who*?
c. It was *whom*/*who*?[1]

The important point that we should note is that the prescriptive rule only works in the formal register. In the informal register, speakers do not stick to this rule and they use *who* in any syntactic environment. This would predict the occurrence of *whom* and the impossibility of *who* in (6).

(6) a. To *whom*/**who* are you referring?
b. someone on *whom*/**who* we can rely

[1] The copular verb *be* requires an accusative complement, except for the formulaic use of nominative as in *It was I*.

(i) a. In this picture, the person in the purple shorts in me/*I.
b. It was just us/*we

See Sobin (1997) and Lasnik and Sobin (2000) for details.

In (6), *who*/*whom* is in the complement position of a fronted PP. The impossibility of *who* in this position will be able to be attributed to the fact that this kind of construction, i.e., pied-piping, is confined to the formal register. Given that the construction itself is in the formal register, the prescriptive rule captures the occurrence of *whom* in (6) since it is a prepositional object.

Thus, if we assume separate rules for the formal and the informal register, we can keep the prescriptive rule for the formal register; for the informal register, *who* is the only available form.

There is, however, a striking fact about the formal register: for many speakers, the distribution of *who* and *whom* does not conform to the prescriptive rule. They allow an alternation of *who* and *whom* for the subject of the lower clause in (2).

(7) a. We feed children *who*/*whom* we think are hungry.
b. the man *who*/*whom* I believe has left.
c. the man *who*/*whom* it was believed had left.

As we noted above, the prescriptive rule would predict only the occurrence of *who* in such a syntactic environment. It seems that not all native speakers of English accept this use of *whom*; for example, Quirk et al (1985: 368) cites the following example as hypercorrection.

(8) * The ambassador, *whom* we hope will arrive at 10 a.m., …

They also mention, however, that this kind of use of *whom* is 'common' (1985: 368), and it is indeed acceptable for many English native speakers.[2] In these sentences *whom* occurs in a position where its source is the subject of a lower finite clause. If we just assumed the above prescriptive rule for the formal register, it would lead to the wrong prediction that *who* is the only form that appears in such a syntactic context. A satisfactory analysis of the *who*/*whom* distinction in the formal register should be able to ensure that some native speakers of English accept *whom* and others reject it in (7); the latter category can be said to manage to conform to the prescriptive rule.

As has been clear, the behaviour of *who*/*whom* appears to be rather complex. In section 2, however, we will show that if we distinguish three

[2] See Jespersen (1924; 1927), Swan (1995), Lasnik and Sobin (2000), Huddleston and Pullum (2002), etc.

separate register types, that is, informal type, prescriptive type, and non-prescriptive type, the apparent complexity of the data is restricted to just non-prescriptive type, and *who*/*whom* in the other two types show a rather straightforward behaviour. Section 3 will show that the general framework of HPSG can accommodate the *who*/*whom* distinction in the informal and prescriptive types without any additional theoretical apparatus beyond those proposed in previous work. In section 4 it will be shown that a linearization-based constraint can provide a straightforward account for the quite puzzling distribution which *who* and *whom* show in the non-prescriptive type. Lasnik and Sobin's (2000) analysis within Virus Theory will be discussed and compared with our HPSG analysis in section 5. Section 6 is the conclusion.

2 Three types of register

On the basis of the observation so far, the distribution of *who* and *whom* can be summarised as in (9).

(9) Distribution of *who* and *whom* by register type

<table>
<tr><th rowspan="2">Environments</th><th colspan="2">Formal</th><th rowspan="2">Informal</th></tr>
<tr><th>non-prescriptive</th><th>prescriptive</th></tr>
<tr><td>Obj in a fronted PP</td><td rowspan="5">whom</td><td rowspan="4">whom</td><td>N/A</td></tr>
<tr><td>Non-subj in embedded clauses</td><td rowspan="5">who</td></tr>
<tr><td>Non-subj in main clauses</td></tr>
<tr><td>Non-subj in situ</td></tr>
<tr><td>Subj of a lower clause</td><td rowspan="2">who</td></tr>
<tr><td>Subj of the first following V</td><td>who</td></tr>
</table>

We assume that there are two registers: formal and informal. We further assume that there are two types for the formal register: the prescriptive type and the non-prescriptive type. Thus we have three types of register: prescriptive, non-prescriptive and informal. (9) makes it clear that each of the three register types has its own version of the *who*/*whom* distribution. The informal register employs *who* in every syntactic environment except for the object position of a fronted PP.

In the prescriptive type of formal register, *whom* is employed in all the non-subject contexts and *who* is employed for subjects, whichever clause it is originated from, the upper or the lower clause (i.e., (1) and (2)). What we should note here is that for this type the choice of *who* works in the same way as assignment of nominative case; any theory of filler-gap dependencies would predict that a filler associated with a gap in the lower clause has the case that is assigned to the position of the gap.

Turning to the non-prescriptive type, *whom* is employed in all cases except where a filler is the subject of the first following V: *whom* is used for a filler that corresponds to the subject of the lower clause (i.e., (7)). This would be totally unexpected if the non-prescriptive type were governed by the same constraints as the prescriptive type. A separate analysis should therefore be provided on the *who*/*whom* distribution in this type.

The next section will deal with the informal and prescriptive types, and then in section 4 we will move on to the non-prescriptive type.

3 Informal and prescriptive types of register

This section shows that no additional theoretical apparatus will be needed beyond those proposed in previous work to give an account for the *who*/*whom* distribution in the informal and the prescriptive types of register.

3.1 Informal register

As discussed in the last section, the informal register employs *who* only. We can give the following description to this lexical item (cf. Wilcock 1999: 383).

(10)
$$\begin{bmatrix} \text{PHON} \ \langle \text{who} \rangle \\ \text{CASE} \ \textit{case} \\ \text{REGSTR} \ \textit{informal} \end{bmatrix}$$

Following Wilcock (1999), we represent register variation in terms of the feature REGISTER (REGSTR), which is appropriate for CONTEXT. The REGSTR feature takes a value of sort *register*, which has two subtypes, *formal* and *informal*.

The underspecification of the CASE value in (10) indicates that the

informal register always employs *who* whatever case it has. Thus, the occurrence of *who* in (1) to (5) is captured by this constraint.

(11) a. *Who*/**whom* wrote the editorial? (1a)
b. We feed children *who*/**whom* we think are hungry. (2a)
c. those *who*/**whom* we consulted. (3a)
d. *Who*/**whom* did you meet? (4a)
e. Who will marry *who*/**whom*? (5a)
f. To *whom*/**who* are you referring? (6a)

Who in (11a,b) is nominative, and that in (11c,d,e) is accusative. The constraint in (10) licenses these occurrences of *who* since its CASE value is underspecified and is compatible with both nominative and accusative. The unavailability of *whom* in the informal register can be accounted for by assuming that this register does not employ this lexical item whatsoever. The impossibility of *who* in pied-piping in (6) can be attributed to the fact that the formal status of pied-piping conflicts with the [REGSTR *informal*] specification of *who*. Wilcock (1999) has provided an argument along the same lines, which is entirely compatible with our approach. Wilcock's (1999) analysis of pied-piping will be summarised in Appendix.

3.2 Prescriptive type of formal register

Let us turn to the prescriptive type of formal register. As discussed earlier, *who* appears not only in an informal style but also in a formal style when it is a subject of the nearest following verb as in (1), and when it is a subject of the lower clause as in (2).

(12) a. *Who*/**whom* wrote the editorial? (1a)
b. We feed children *who*/**whom* we think are hungry. (2a)

In these syntactic environments, *whom* is excluded. In all the non-subject environments, however, *whom* is employed.

(13) a. those *whom*/**who* we consulted. (3a)
b. *Whom*/**who* did you meet? (4a)
c. Who will marry *whom*/**who*? (5a)
d. To *whom*/**who* are you referring? (6a)

The distribution of *who* and *whom* in this type can be formalised along the

same lines as an ordinary case assignment.[3] We propose that the grammar of the prescriptive type of formal register includes the following constraints.

(14) a. *who* (prescriptive type)

$$\begin{bmatrix} \text{PHON} \langle \text{who} \rangle \\ \text{CASE } \textit{nom} \\ \text{REGSTR } \textit{formal} \end{bmatrix}$$

b. *whom* (prescriptive type)

$$\begin{bmatrix} \text{PHON} \langle \text{whom} \rangle \\ \text{CASE } \textit{acc} \\ \text{REGSTR } \textit{formal} \end{bmatrix}$$

Who in (12a) is nominative, so it is licensed by (14a). (14b), which only licenses use of *whom* when accusative, excludes *whom* from this environment. The SLASH mechanism requires the LOC value of the filler to be the same as that of the gap, and therefore a filler associated with a gap in lower clause is assigned the case that is assigned to the position of the gap. In the case of *who* in (12b), the filler has nominative case since the SLASH mechanism ensures that it has the same LOC value and hence the same case as the gap. Thus, these two constraints and the HPSG view of unbounded dependencies capture the occurrence of *who* in the prescriptive type of formal register, in such examples as (1) and (2). *Whom* in (13) occurs in positions where accusative nominal is expected. Therefore, the lexical constraint (14b) licenses *whom* in these positions, but *who* is excluded due to (14a).

In this section, we have shown that existing, independently motivated theoretical apparatus within HPSG can capture the *who*/*whom* distribution in the prescriptive and informal types. In the next section, we will move on to the non-prescriptive type of formal register in which *who* and *whom* show an apparently puzzling behaviour as discussed in the earlier sections.

[3] For the HPSG literature on case, see Heinz and Matiasek (1994), Meurers (2000), Pollard (1994), Przepiórkowski (1999), etc.

4 The non-prescriptive type of formal register

The characteristics of the non-prescriptive type of formal register are illustrated by the following minimal pair.

(15) a. the man *who*/**whom* has left
b. the man *whom*/**who* I believe has left

It is impossible to adopt the case marking strategy proposed for the prescriptive type in the last section since the SLASH mechanism would allow the CASE value of the both types of subject to have the same range of choice.

We look at the pair in (15) from the point of view of linear order: *who* is employed for the subject of the nearest following verb and *whom* for the subject of a later verb. In this section, we will formalize this observation. Before that, however, some theoretical assumptions will be introduced in the first sub-section.

4.1 Linearization-based HPSG

The analysis to be presented below will be based on a version of linearization-based HPSG. In this framework, linear order is represented in a separate level of 'order domains', to which ordering constraints apply (see, e.g., Pollard et al. 1993; Reape 1994; and Kathol 2000). Order domains are given as the value of the attribute DOM(AIN). At each level of syntactic combination, the order domain of the mother category is computed from the order domains of the daughter constituents. We assume, along with Reape (1994), Donohue and Sag (1999), Kathol (2000: 101), and Jaeger (2003), that an order domain consists of an ordered list of signs, which we will call 'DOM elements'.[4] The domain elements of a daughter may be compacted to form a single element in the order domain of the mother or they may just become elements in the mother's order domain. In the latter case the mother has more domain elements than daughters.

Each element of a clausal order domain is uniquely marked for the region that it belongs to (Kathol 2000; see also Borsley and Kathol 2000; Chung and Kim 2003; Kathol 2002; and Penn 1999).[5] The assignment of

[4] The assumption that DOM elements are signs might involve some problems. See Kathol (2000) for discussion.

[5] In the case of German, this partitioning of the clausal domain directly encodes the

each element in a clause can be summarised as follows (Kathol 2002).

(16)

	first	*second*	*third*	*fourth*	*fifth*
a.	Who	did	Sandy	see?	
b.	Never	would	Kim	eat	those cookies
c.		Will	Kim	sneeze?	
d.			Kim	will eat	those cookies
e.			Who	ate	those cookies

Wh-phrases which are not the subject of the verb in *fourth* are assigned to *first*. Thus, the clause-initial element in verb-second clauses, such as the *wh*-phrase in (16a) and the negative phrase in (16b), are in *first*. In these clause types, finite verbs are assigned to *second*. Finite verbs in verb-first clauses such as polar questions (16c) are also in *second*. Verbs which are not in *second* are in *fourth*, whether they are finite or non-finite. Complements of the verb in *fourth* are in *fifth*. Finally, subjects of the verb in *fourth* are in *third*, whether they are a filler or an ordinary subject. If we do not treat a subject *wh*-phrase as a case of extraction (Pollard and Sag 1994; see also Gazdar 1981), this positional assignment will easily be incorporated into the Head-Subject Schema. Evidence has recently been put forth, however, that a subject *wh*-phrase is an instance of true extraction (Bouma et al. 2001; Ginzburg and Sag 2000; Levine and Hukari 2003). Therefore, we assume the following additional constraint on head-filler structures: if the LOC value of the filler is token-identical with that of the single element in the SUBJ list of the verb in *fourth*, then it is assigned to *third* .

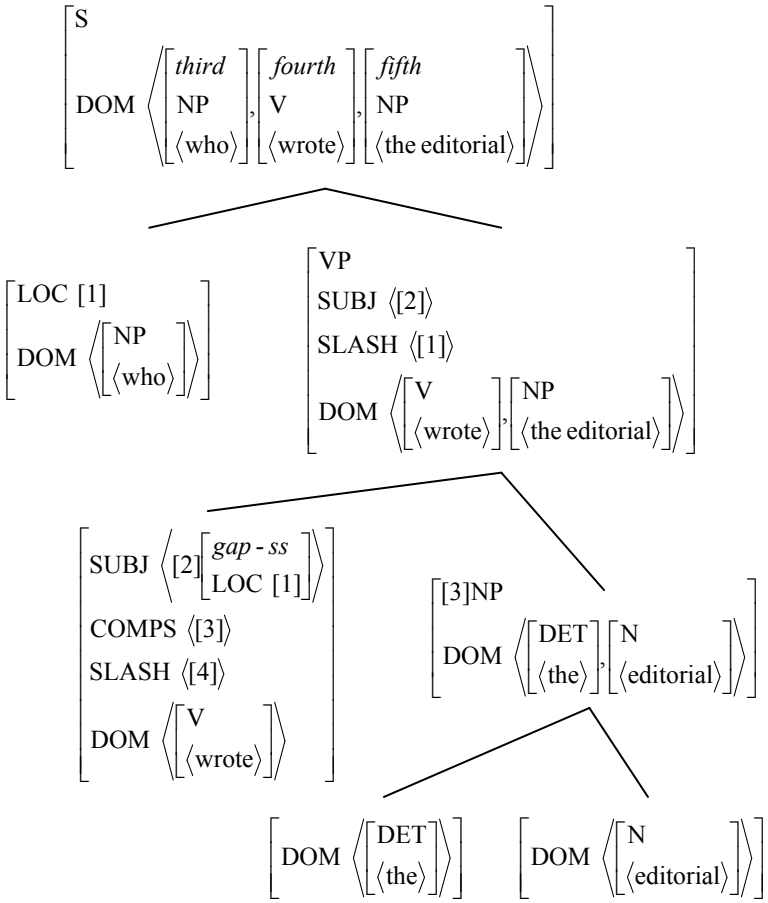
In this framework, *Who wrote the editorial?* has the representation in (17) at the next page.[6] The NP *the editorial* has two daughters, and two DOM elements, *the* and *editorial*. The VP *wrote the editorial* has two daughters and its order domain contains two DOM elements, one for *wrote* and one for *the editorial* which has been compacted to a single element. The top S node has two daughters but its order domain contains three DOM

traditional German grammar notion of 'topological fields'. See Kathol (2000) for details.

[6] The combinatorial structure represented here is based on Ginzburg and Sag (2000: 236ff), but it is simplified.

elements, which are for *who*, *wrote* and *the editorial*, respectively. According to the assumptions for position assignment outlined above, *who* is assigned to *third*, *wrote* to *fourth*, and *the editorial* to *fifth*.

(17)



4.2 A linearization-based HPSG account

We are now in a position to account for the *who*/*whom* distribution in the non-prescriptive type of register. We assume that the grammar of this register type include the following lexical constraints for *who* and *whom*, instead of (14a,b) for the prescriptive type.

(18) a. *who* (non-prescriptive type)

$$\begin{bmatrix} \text{REGSTR} & \textit{formal} \\ \text{DOM} & \left\langle \begin{bmatrix} \textit{third} \\ \text{PHON} & \langle \textit{who} \rangle \end{bmatrix} \right\rangle \end{bmatrix}$$

b. *whom* (non-prescriptive type)

$$\begin{bmatrix} \text{REGSTR} & \textit{formal} \\ \text{DOM} & \left\langle \begin{bmatrix} \neg\, \textit{third} \\ \text{PHON} & \langle \textit{whom} \rangle \end{bmatrix} \right\rangle \end{bmatrix}$$

The lexical description (18a) allows *who* to occur only in *third*. Due to the lexical description (18b) for *whom*, it is allowed to occur anywhere else.

The DOM value of the top S node of (15a) looks as follows (Recall the combinatorial structure of (1a) given in (17)).[7]

(19)
$$\begin{bmatrix} \text{DOM} & \left\langle \begin{bmatrix} \textit{third} \\ \text{NP} \\ \text{PHON} & \langle \text{who} \rangle \\ \text{LOC} & [1] \\ \text{REGSTR} & \textit{formal} \end{bmatrix}, \begin{bmatrix} \textit{fourth} \\ \text{V} \\ \text{PHON} & \langle \text{wrote} \rangle \\ \text{SUBJ} & \left\langle \begin{bmatrix} \textit{gap - ss} \\ \text{LOC} & [1] \end{bmatrix} \right\rangle \end{bmatrix}, \ldots \right\rangle \end{bmatrix}$$

In the order domain, *who* occurs in *third* as its LOC value is token-identical to that of the single element of the SUBJ list of the verb. The representation in (20) is not well-formed since *whom* occurs in *third*, which violates the constraint (18b).

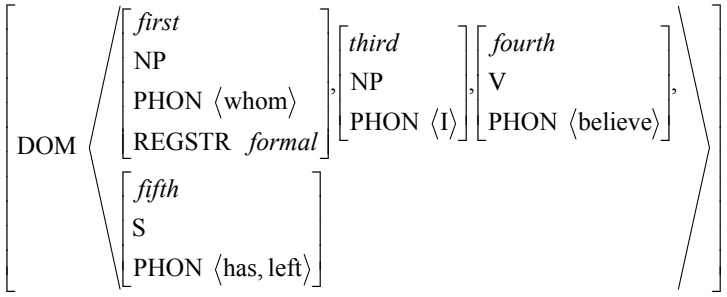
(20) *
$$\begin{bmatrix} \text{DOM} & \left\langle \begin{bmatrix} \textit{third} \\ \text{NP} \\ \text{PHON} & \langle \text{whom} \rangle \\ \text{LOC} & [1] \\ \text{REGSTR} & \textit{formal} \end{bmatrix}, \begin{bmatrix} \textit{fourth} \\ \text{V} \\ \text{PHON} & \langle \text{wrote} \rangle \\ \text{SUBJ} & \left\langle \begin{bmatrix} \textit{gap - ss} \\ \text{LOC} & [1] \end{bmatrix} \right\rangle \end{bmatrix}, \ldots \right\rangle \end{bmatrix}$$

The nominative *whom* in (15b) can be accounted for in the following

[7] Only the relevant information is shown here.

way. The top S node of (15b) has the DOM list of the following sort.[8]

(21)



As stated earlier, we assume that a *wh*-phrase which is not the subject of the verb in *fourth* is assigned to *first*. In (21) *whom* is not the subject of *believe*, and therefore it occurs in *first*. This is compatible with constraint (18b) that specifies its occurrence in this position. Due to (18a), however, *who* is not allowed in this position in the non-prescriptive type since the occurrence of *who* is restricted just to *third*.

Constraint (18b) can capture the occurrence of *whom* in (3) to (6). Let us look at each case.

(22) a. those *whom*/**who* we consulted. (3a)
b. *Whom*/**who* did you meet? (4a)
c. Who will marry *whom*/**who*? (5a)
d. To *whom*/**who* are you referring? (6a)

Positional assignment of the elements in each of these sentences is as follows.

(23)

	first	*second*	*third*	*fourth*	*fifth*
(22a)	**whom**		we	consulted	
(22b)	**Whom**	did	you	meet	
(22c)			Who	will	marry **whom**
(22d)	To **whom**	are	you	referring	

[8] It is assumed that an embedded clause is totally-compacted when it is combined with a higher clause. Thus, the clause *has left* is a single compacted DOM element in (21). See Ginzburg and Sag (2000: 180ff) for details of the constituent structure of this sort of construction.

(23) shows that *whom* in (22a,b) is in *first*, and *whom* in (22c,d) is included in a domain element in *fifth*.[9] Thus, every occurrence of *whom* in (22) conforms to (18b) which determines its occurrence in positions which are not *third*. On the other hand, use of *who* in these environments are excluded by (18a), which restricts its occurrence to *third*.

The following examples where there is an adverb intervening between *who* and the verb can also be accounted for by our analysis.

(24) a. a man who/*whom *never* sleeps
b. Who/*whom *often* saw John?

The order domain of the relative clause in (24a) has the following representation.

(25)

$$\left[\text{DOM}\left\langle\left[\begin{array}{l}\textit{third}\\ \text{NP}\\ \text{PHON}\ \langle\text{who}\rangle\\ \text{LOC}\ [1]\\ \text{REGSTR}\ \textit{formal}\end{array}\right],\left[\begin{array}{l}\textit{fourth}\\ \text{ADV}\\ \text{PHON}\ \langle\text{never}\rangle\\ \text{MOD}\ [2]\end{array}\right],\left[\begin{array}{l}\textit{fourth}\\ [2]\text{V}\\ \text{PHON}\ \langle\text{sleeps}\rangle\\ \text{VFORM}\ \textit{fin}\\ \text{SUBJ}\ \langle[\text{LOC}\ [1]]\rangle\\ \text{SLASH}\ \{[1]\}\end{array}\right]\right\rangle\right]$$

We follow Kathol (2002) in assuming that preverbal adverbials as in (24) are assigned to *fourth*, along with the verbs. In (25), although there is an intervening adverb *never*, *sleeps* is in *fourth*, and *who* is its subject (i.e., its LOC value [1] is token-identical with the LOC value of the single element in the SUBJ list of *sleeps*). *Who* is therefore assigned to *third*, and that is licensed by constraint (18a); *whom* is banned because of its positional specification as [¬*third*] in (18b).

We assumed earlier that verbs which are not in *second* are in *fourth*. This means that verbs in *third* can be not only finite, as all the examples so far, but also non-finite (i.e., *infinitive*, *base*, *participle*; see Ginzburg and Sag 2000: 24). We further assumed that the element positioned in *third* is a

[9] We assume *wh*-phrases to occur in *first* in embedded clauses in English, unlike German (Kathol 2000, 2001). In the embedded clause of (i), *second* is occupied by *would*, and hence it is natural to assume that *what* (as well as *under no circumstances*) is in *first*.
(i) I wonder [what under no circumstances would John do for Mary].

subject of the verb in *fourth*. It is predicted, therefore, that *who* can be a subject of the non-finite verb in *third*. This is borne out by the following example.

(26) A: What did Kim do?
B: What did *who* do?

The utterance B is an example of an echo question.[10] In this sentence *who* is followed by an non-finite verb *do*. The DOM list of the lower S (i.e., [did who do]) would look like the following.

(27)

$$\left[\text{DOM}\left\langle\begin{bmatrix}\textit{second}\\ \text{V}\\ \text{PHON}\ \langle\text{did}\rangle\\ \text{SLASH}\ \{[1]\}\\ \text{SUBJ}\ \langle[2]\rangle\\ \text{COMPS}\ \langle[3]\rangle\end{bmatrix},\begin{bmatrix}\textit{third}\\ [2]\text{NP}\\ \text{PHON}\ \langle\text{who}\rangle\\ \text{LOC}\ [4]\\ \text{REGSTR}\ \textit{formal}\end{bmatrix},\begin{bmatrix}\textit{fourth}\\ [3]\text{V}\\ \text{PHON}\ \langle\text{do}\rangle\\ \text{VFORM}\ \textit{base}\\ \text{SLASH}\ \{[1]\}\\ \text{SUBJ}\ \langle[2][\text{LOC}\ [4]]\rangle\\ \text{COMPS}\ \langle\ \rangle\end{bmatrix}\right\rangle\right]$$

As we assumed earlier, finite verbs in verb-second clauses such as *wh*-questions are in *second*. The non-finite verb *do* is in *fourth*, and *who* is its subject (i.e., its LOC value [4] is token-identical with the LOC value of the single element in the SUBJ list of *sleeps*). *Who* is therefore in *third*, and that is licensed by (18a); *whom* is excluded since (18b) states that its positional specification is [¬*third*].

4.3 Summary

In this section, we have provided an account for the seemingly puzzling distribution of *who*/*whom* in the non-prescriptive type. The lexical descriptions of *who* (18a) and *whom* (18b) incorporate the specification of the position where they should occur: *who* is restricted to *third* while *whom* is specified to occur in the positions other than *third*. What is significant is that we abandoned the idea that the *who*/*whom* distinction is a matter of case marking, and that makes it possible to accommodate the occurrence of *whom*

[10] See Ginzburg and Sag (2000: 255ff) for details of an HPSG treatment of echo questions.

in the cases where nominative case is normally expected, as in (15b).

5 Lasnik and Sobin's (2000) approach

In this section we consider the ability of another approach to capture the relevant facts. A recent attempt to provide a theoretical account of the *who*/*whom* distinction is Lasnik and Sobin's (2000).[11] They argue that *who* is the basic form of the *wh*-pronoun, which can check either nominative (NOM) or accusative (ACC) case. The suffix *-m* of *whom* is assumed to be associated with an additional ACC feature and has to be checked independently of the ACC feature associated with the stem *who*. This additional ACC feature carried by the suffix is checked by the rules with the status of 'grammatical viruses', characterised as extra-grammatical devices, entirely independent of ordinary case marking mechanisms. They serve to license prestige forms. Rule (28) licenses the occurrence of *whom* as object of a verb or preposition, as in (5) and (6).

(28) The Basic 'whom' Rule (Lasnik and Sobin 2000: 354)

If:	[$_{V/P}$]	*who-*	*-m*
		[ACC]	[ACC]
	1	2	3

then: check ACC on 3

Rule (29) licenses the occurrence of initial *whom* in any type of *wh*-construction where the *wh*-pronoun functions as the object of a verb (3a, c) and (4a), stranded preposition (3b) and (4b), or the subject of an embedded clause (7).

(29) The Extended 'whom' Rule (Lasnik and Sobin 2000: 359)

If:	*who-*	*-m*	…	*NP*,	where
		[ACC]			
	1	2		3	

a) 3 is the nearest subject NP to 2, and

b) '…' does not contain a V which has 1–2 (a single word *whom*) as its subject,

[11] See also Kayne (1984) and Radford (1988).

then: check ACC on 2.

The unacceptable occurrences of *whom* in (1) are ruled out by the fact that they are not compatible with the sequential arrangement of (28) or (29).

However, their approach involves some problems. First, it is not clear whether the *who*/*whom* distinction should be treated as a matter of case. Two different forms of a lexeme should not necessarily be seen as two different case forms. If they are not realisations of case, it will not be necessary to assume that the stem *who-* and the affix *-m* have two different cases. Other things being equal, it would be preferable not to have such a counter-intuitive assumption.

Second, as Lasnik and Sobin (2000: 362) themselves note, (29) is fairly complex; especially it includes the stipulations about 3 and about what can appear between 2 and 3. A rule that is acquired in a special way may be complex than an ordinary grammatical rule, and, as they suggest (2000: 362), such complexity may be a reason for being a prestige usage. Complexity, however, is a potential source of suspicion, and it is indeed suspicious in this case since the stipulations included are questionable. First, it is not obvious how 'the nearest subject NP to 2' is to be identified within Principles and Parameters assumptions. Next, their analysis includes the stipulation about what can appear between 2 and 3: the V should be a theta-role assigner and must not be an auxiliary verb. It is not clear why a theta-role assigning ability is relevant here. Our HPSG analysis is clearly simpler which is free of any questionable stipulations.

6 Concluding remarks

In this paper, we have been concerned with the distribution of the English interrogative/relative pronouns *who* and *whom*. We have first described the distribution of *who* and *whom*, which appears to be complex. In section 2, we showed that the apparent complexity of the data is restricted to just non-prescriptive type if we distinguish three separate register types: informal type, prescriptive type, and non-prescriptive type. Section 3 illustrated that the general framework of HPSG can accommodate the *who*/*whom* distinction in the informal and prescriptive types without any additional theoretical apparatus beyond those proposed in previous work. In section 4 we showed that a linearization-based constraint can provide a straightforward account for

the quite puzzling distribution which *who* and *whom* show in the non-prescriptive type. Section 5 discussed Lasnik and Sobin's (2000) analysis within Virus Theory and it was compared with our HPSG analysis.

The most important point to note is that the constraints in (18), which are responsible for the use of *who* and *whom* in the non-prescriptive type of formal register, is formalised in terms of order domains. If our analysis is on the right track, it suggests that order domains are important not only for analysing linearization phenomena but also for the analysis of certain word forms. This matches the recent development of linearization-based HPSG, in which order domains have been concerned with more than just linearization.

Appendix: Wilcock's (1999) analysis of *whom* in pied-piping

The impossibility of *who* in pied-piping in (6) is due to the fact that the formal status of pied-piping conflicts with the [REGSTR *informal*] specification of *who*, along the lines of Wilcock (1999; cf. Paolillo 2000).

(6) a. To *whom*/**who* are you referring?
b. someone on *whom*/**who* we can rely

This appendix will summarise Wilcock's (1999: 384ff) approach to this issue.

Wilcock (1999) notes systematic covariation between register and nonlocal features of preposition. This is formalised as lexical constraints in which register restrictions are associated with PP construction subtypes.

(30) a. $$\textit{rel - prep} \rightarrow \begin{bmatrix} \text{HEAD } \textit{prep} \\ \text{QUE } \{\ \} \\ \text{REL } \{[1]\} \\ \text{SLASH } \{\ \} \\ \text{REGSTR } \textit{formal} \end{bmatrix}$$

b. $$\textit{que - prep} \rightarrow \begin{bmatrix} \text{HEAD } \textit{prep} \\ \text{QUE } \{[1]\} \\ \text{REL } \{\ \} \\ \text{SLASH } \{\ \} \\ \text{REGSTR } \textit{formal} \end{bmatrix}$$

(30) requires prepositions with non-empty REL (30a) and non-empty QUE

(30b) to have the formal register. The combination of these lexical constraints with the Register Amalgamation Constraint (31) provides an account for the distribution of *who*/*whom* in (6).

(31) Register Amalgamation Constraint (Wilcock 1999: 382)

$$word \rightarrow \begin{bmatrix} \text{ARG-ST} & \langle [\text{REGSTR } [1]], \cdots, [\text{REGSTR } [1]] \rangle \\ \text{REGSTR} & [1] \end{bmatrix}$$

(31) is a lexical constraint that ensures the amalgamation of contextual information from a word's arguments.

(32) is the constituent structure for the filler PP of (6a).

(32)

$$\begin{bmatrix} \text{PP} \\ \text{PHON} & \langle \text{to, whom} \rangle \\ \text{QUE} & \{[1]\} \\ \text{REGSTR} & \textit{formal} \end{bmatrix}$$

$$\begin{bmatrix} \textit{que-prep} \\ \text{PHON} & \langle \text{to} \rangle \\ \text{ARG-ST} & \left\langle [2] \begin{bmatrix} \text{QUE} & \{[1]\} \\ \text{REGSTR} & [3] \end{bmatrix} \right\rangle \\ \text{QUE} & \{[1]\} \\ \text{REGSTR} & [3]\textit{formal} \end{bmatrix} \qquad \begin{bmatrix} [2]\text{NP} \\ \text{PHON} & \langle \text{whom} \rangle \\ \text{INDEX} & [1] \\ \text{QUE} & \{[1]\} \\ \text{REGSTR} & [3]\textit{formal} \end{bmatrix}$$

The SLASH Amalgamation Constraint requires that the non-empty QUE of *whom* should be amalgamated into the QUE value of *with*. The preposition has thereby a non-empty QUE, so constraint (30b) requires it to have the formal register. The Register Amalgamation Constraint (31) requires the REGSTR value of the argument to be unified with that of the head. This requirement is indeed satisfied here since *whom* is lexically specified as [REGSTR *formal*] by (14b).[12]

Let us turn to ungrammaticality of *who* in (6). The representation of

[12] In order to ensure that a phrase inherits the REGSTR values of its daughters, Wilcock (1999: 377) introduces the Contextual Head Inheritance Principle, which states that in a *head-nexus-phrase* and a *head-adjunct-phrase* the phrase's CONTEXT is by default token-identical to that of its contextual head daughter.

the head of the filler PP in (6a) is something like the following.

(33) * $\begin{bmatrix} \textit{que-prep} \\ \text{PHON } \langle \text{to} \rangle \\ \text{ARG-ST } \left\langle [2] \begin{bmatrix} \text{QUE } \{[1]\} \\ \text{REGSTR } \textit{informal} \end{bmatrix} \right\rangle \\ \text{QUE } \{[1]\} \\ \text{REGSTR } [3]\textit{formal} \end{bmatrix}$

The SLASH Amalgamation Constraint requires the non-empty QUE of *who* to be amalgamated into the QUE value of *to*, which is tagged [1] in (33). The preposition has thereby a non-empty QUE, so constraint (30b) requires it to have the formal register. However, the REGSTR value of *who* cannot be unified with that of *with*: *informal* and *formal*, respectively. This is a violation of the Register Amalgamation Constraint (31).

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