

Don't Move!¹

Robert D. Borsley
rborsley@essex.ac.uk
University of Essex

DOI to be assigned

Abstract: All versions of Transformational Grammar assume that movement is a central feature of the syntax of human languages. However, frameworks which make no use of movement processes have existed for thirty years, and there has been very little attempt to show that movement analyses are superior to the analyses proposed within these frameworks. The strongest evidence for movement comes from filler-gap dependencies, where there is an extra clause-initial constituent of some kind and a gap somewhere later in the clause. *Wh*-questions are a typical example. The assumption that the filler has moved from the position of the gap accounts for the appearance of both the filler and the gap. However, consideration of a broader range of data casts doubt on the movement approach. There are (i) cases which look like filler-gap dependencies where there is no visible filler, (ii) cases with two gaps, (iii) cases where filler and gap do not match, and (iv) cases in various languages which look like filler-gap dependencies but where there is not a gap but a resumptive pronoun (RP). The alternative to movement that has been developed within Head-driven Phrase Structure Grammar involves the feature SLASH, which makes certain kinds of information available higher and lower in the structure than would normally be the case. There is no reason (i) why this information should always be associated with a filler, (ii) why it should not be associated with more than one gap, (iii) why it should not be associated with a gap with rather different properties, and (iv) why it should not be associated with an RP. For all these reasons, it seems that the SLASH-based approach is superior to a movement approach.

Keywords: Movement, Transformational Grammar, Unbounded Dependencies, SLASH.

Resumen: Todas las versiones de Gramática Transformacional asumen que el movimiento es un rasgo esencial de la sintaxis del lenguaje humano. Sin embargo, desde hace treinta años, existen marcos teóricos que no hacen uso este mecanismo. Aún así ha habido muy pocos intentos de demostrar que la

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hipótesis del movimiento es superior a las hipótesis sin él. La evidencia más fuerte a favor de la hipótesis del movimiento proviene de las dependencias filler-gap en las que existe un constituyente extra de cierto tipo al inicio de la cláusula y un hueco en algún lugar más tarde en la cláusula. Las oraciones interrogativas-q son un ejemplo típico: la premisa de que el *filler* (elemento de relleno) ha sido desplazado desde el *gap* (hueco) da cuenta de la aparición del elemento de relleno y del hueco en la misma cláusula. No obstante, si se tienen en cuenta ciertos ejemplos surgen dudas sobre esta hipótesis. Existen casos en los que (i) existen dependencias filler-gap en las que no hay un *filler* visible, (ii) estructuras con dos *gaps*, (iii) casos en los que el elemento de relleno y el hueco no están coordinados y (iv) casos en varias lenguas en las que parece una dependencia de filler-gap pero no existe un hueco sino un pronombre reasumptivo (PR). La alternativa al movimiento que ha sido desarrollada por la Gramática de la Estructura de la Frase (HPSG) implica al rasgo SLASH que hace que cierto tipo de información esté disponible más arriba y más abajo de la posición en la estructura que le correspondería normalmente. No hay razón por la que esta información (i) debiera estar siempre asociada con un elemento relleno, (ii) no pueda ser asociada con más de un hueco, (iii) no debiera estar asociada con un hueco con propiedades diferentes y (iv) no debiera estar asociada con un PR. Por todo ello, parece que la aproximación basada en la propiedad SLASH es superior a la aproximación del movimiento.

Palabras clave: Movimiento, Gramática Transformacional, Dependencias a larga distancia, SLASH.

Resumen: Todas as versões da Gramática Transformacional assumem que o movimento é uma característica central da sintaxe das línguas humanas. No entanto, nos últimos trinta anos, têm surgido quadros teóricos que não incluem processos de movimento e não tem havido tentativas para demonstrar que as análises com movimento são superiores às análises propostas por estes quadros teóricos. A evidência mais forte a favor da existência de movimento são as dependências filler-gap, em que encontramos um constituinte independente em posição inicial de frase e um gap numa posição mais final na frase. Os constituintes Wh- são um típico exemplo. A hipótese de que o filler se moveu para a posição de gap dá-nos evidências da existência tanto de filler como de gap. No entanto, algumas considerações sobre uma quantidade maior de dados têm levantado dúvidas sobre a existência de movimento. Há (i) casos que parecem ser dependências filler-gap onde não há filler visível, (ii) casos com dois gaps, (iii) casos em que o filler e o gap não se correspondem, e (iv) casos, em muitas línguas, que parecem ser dependências filler-gap, mas onde há um pronome resumptivo (RP) em vez de um gap. A alternativa que tem sido adotada pela Head-driven Phrase Structure Grammar envolve o traço SLASH, que disponibiliza alguns tipos de informação em posições mais acima e mais abaixo na estrutura do que normalmente seria o caso. Não há razão pela qual esta informação (i) deva estar sempre associada a um a filler, (ii) não deva estar associada a mais de um gap, (iii) não deva estar associada a um gap com propriedades diferentes, e (iv) não deva estar associada a um RP. Por estas razões, a abordagem SLASH parece ser superior à abordagem via movimento.



Palabras clave: Movimiento, Gramática Transformacional, dependências de longa distância, SLASH.

1. Introduction

Transformational Grammar (TG) has existed in various forms for over half a century. For more than half that time it has enjoyed the services of Andrew Radford as a skilful advocate. In a series of textbooks he has sought to explain and recommend a transformational approach to syntax (Radford 1981, 1988, 1997, 2004, 2009). The Extended Standard Theory (EST), which was the focus of the first book, was very different from early TG, and more recent versions differ in major ways from EST. However, all versions of TG have at least one property in common: the idea that movement is a central feature of the syntax of human languages.² Thus, whatever else it does, any textbook introduction to TG introduces the concept of movement. This is true of all of Andrew Radford's textbooks.

In this paper I will take a critical look at this central feature of TG work. In particular, I will look at filler-gap dependencies, which provide the strongest argument for movement (as in effect recognized in Radford 1981). I will show how movement seems to provide an attractive account of such dependencies. Then, I will show that a consideration of a broader range of data casts serious doubt on the movement approach. I will then demonstrate that the phenomena that are problematic for a movement approach are no problem for the SLASH feature approach of Head-driven Phrase Structure Grammar (HPSG). Thus, far from providing support for a movement approach, filler-gap dependencies in fact provide a reason for preferring a rather different approach.

The paper is organized as follows. In section 2, I look at the role of movement within mainstream work and what is said about it. Then, in section 3, I introduce the movement approach to filler-gap dependencies. In section 4, I consider four types of example which are quite problematic for movement. Then, in section 5, I show that the four types of example are unproblematic for HPSG's SLASH feature approach. Finally, in section 6, I conclude the paper.

² It is sometimes said in the TG literature that movement is a metaphor. Thus, Chomsky (2001a) remarks that '[d]isplacement is implemented by selecting a target and a related category to be moved to a position determined by the target', and then comments in footnote 4 that '[t]erminology is often metaphoric here and below, adopted for expository convenience'. It is not clear to me what to make of such talk, and I will ignore it in subsequent discussion.



2. Background

Within the Chomskyan mainstream, movement is regarded as an uncontroversial feature of the syntax of natural languages.³ There is a lot of it. Consider firstly the very simple sentence in (1).

- (1) Kim talked to Lee.

On fairly standard mainstream assumptions there are two movements here, movement of the verb to the light verb *v*, and movement of the subject from Spec *v*P to Spec TP. Thus, we have the following analysis, where I make the standard assumption that movement leaves behind a copy deleted in PF:

- (2) [TP Kim [_{VP} ~~Kim~~ talked [_{VP} ~~talked~~ to Lee]]]
-

Consider next the following quite simple *wh*-question:

- (3) Who did Kim talk to?

On standard assumptions there are five movements here. In addition to the two movements in (1) this involves two instances of *A'*-movement, one to the edge of *v*P and one to Spec CP, and movement of the auxiliary *did* from T to C. Hence, we have the following:

- (4) [CP Who did [TP Kim ~~did~~ [_{VP} ~~who~~ Kim talk [_{VP} talk to ~~who~~]]]]]
-

More complex sentences with subordinate clauses of various kinds will have many more movement processes.

An interesting example is Kayne's (1999) analysis of infinitival *to* and similar elements. On this analysis, an innocent looking phrase such as *tried to sing* is the product of a complex sequence of movements. *To* originates above VP and attracts an infinitival constituent to its specifier position. It then moves to a higher functional head *W*, and VP, from which the infinitive has been extracted, moves to the specifier position of this head. Thus, we have the following derivation, where *to* make things as clear as possible I use coindexed traces rather than copies:

- (5) *to* [_{VP} tried [_{IP} sing]] ⇒
 [_{IP} sing]_i *to* [_{VP} tried t_i] ⇒
 t_o_j [_{IP} sing]_i t_j [_{VP} tried t_i] ⇒
 [_{VP} tried t_i]_k t_o_j [_{IP} sing]_i t_j t_k

³ I use the term 'Chomskyan' throughout in a relatively narrow sense to refer to proponents of various forms of transformational grammar. Arguably some of the main alternatives to transformational grammar are Chomskyan in a broad sense.



In Borsley (2001a) I highlighted how little motivation was offered for this complexity. I also showed how the analysis faces a variety of problems. For example, I pointed out that it predicts that (6) has the structure indicated here:

(6) Kim [is happy] to leave.

In other words, it does not treat *happy to leave* as a constituent. Examples like the following suggest that it is:

(7) Kim is both happy to leave and ready to go.

(8) The way Kim is happy to leave, and happy to leave he is.

Similarly, it predicts that (9) has the structure indicated:

(9) Kim [[knows where] [to go]].

Again there is evidence, e.g. from examples like the following, that this is wrong:

(10) Where to go no one knows.

(11) I don't know where to go or what to do.

In a number of cases one of the referees suggested that the problems could be solved by postulating additional movement processes. In a sense he or she was right. If movement processes are freely available, it will always be possible to rescue an analysis which gets the structure wrong. But elementary scientific methodology, especially Occam's razor, entails that movement processes cannot be freely available.

An emphasis on Occam's razor has sometimes been seen as the defining property of the Minimalist framework. There is clearly more to Minimalism than this. Thus, Chomsky (2002) emphasizes that he is committed not just to Methodological Minimalism but also to Substantive Minimalism, which is something different. However, the term Minimalism suggests an emphasis on simple solutions. But minimalists seem to have no qualms about the kind of complexity that we see in Kayne's analysis. The idea that a large battery of movement operations might not be the simplest solution never seems to occur to the orthodox.⁴

Whatever some Chomskyans may think, an analysis with fewer movement processes must be preferable other things being equal to one with more movement processes, and an analysis with no movement must be preferable, again other things being equal, to one that has movement. Until about 1980

⁴ It is also part of the ideology of Minimalism that it questions longstanding assumptions. Thus, Chomsky (2002) remarks that '[m]y own view is that almost everything is subject to question'. However, movement is never really questioned within the mainstream.



movement was more or less ‘the only game in town’.⁵ However, since then it has been rejected by a variety of approaches, notably Generalized Phrase Structure Grammar, HPSG, Lexical Functional Grammar (LFG), and Categorical Grammar. Surprisingly perhaps, advocates of movement have made little attempt to show that movement-based analyses are superior to the alternatives developed within these frameworks.

Radford (1981: 149-152) tried to show that *wh*-questions pose a problem for approaches employing just phrase structure rules and argued that a movement process provides a solution to this problem.⁶ It is indeed difficult to handle *wh*-questions if one doesn’t exploit the potential of complex syntactic categories. However, more or less everyone has assumed since the 1960s that syntactic categories are complex entities, and if one assumes this, it is not difficult to deal with *wh*-questions, as Gazdar (1981) showed. I will return to this in section 5.

Later Radford textbooks explain how a movement approach handles various kinds of data but make no attempt to show that such an approach is superior to possible alternatives. They essentially take movement for granted. Thus, Radford (2009: 20) introduces movement as follows:⁷

If we compare the echo question *He had said who would do what?* in (18) with the corresponding non-echo question *Who had he said would do what?* in (19), we find that (19) involves two movement operations which are not found in (18).

But we only find this if we go looking for movement operations. What we find if we are not wedded to movement is certain similarities and differences between the two sentences in form and meaning, which must be accommodated by a satisfactory analysis. It is not difficult to provide a satisfactory account of

⁵ This is a slight simplification. Beginning in 1974, Relational Grammar offered a non-movement approach to what for Chomskyans are A-movement phenomena (passive, raising, etc.). Among the places where this approach was developed was Radford (1977), which one reviewer described as ‘a very fine and stimulating piece of work which sets out to explode, with great singleness of purpose, the whole fabric of configurational linguistics’ (Posner 1978). However, Relational Grammar had little to say about what Chomskyans see as A'-movement phenomena, which, as noted below, provide the most persuasive argument for movement.

⁶ Similar arguments can be found in some earlier textbooks. For example, Akmajian and Heny (1975: 78-95) tried to show that an approach limited to phrase structure rules could not provide a satisfactory account of *yes-no* questions and passives, asserting that ‘we can be sure that phrase structure grammars cannot possibly represent all the significant aspects of language structure’ (1975: 86).

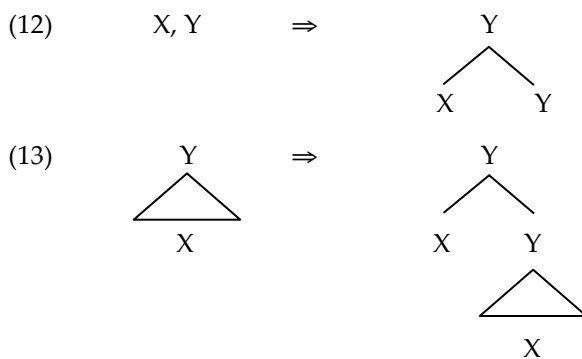
⁷ See also Radford (2004: 14).



the similarities and the differences without movement, as Ginzburg and Sag (2000) show.

Others suggest that semantic considerations provide support for movement analyses. For example, Hornstein, Nunes and Grohmann (2005: 7) assert that one of the 'big facts' of language is that '[s]entences show displacement properties in the sense that expressions that appear in one position can be interpreted in another'. They assume that movement provides an explanation for such displacement properties. These properties undoubtedly exist, but they can be accommodated perfectly satisfactorily in movement-free approaches.

Chomsky (2001b) suggests in effect that simplicity favours movement. Assuming the standard copy theory of movement, he argues that if a framework has an operation of External Merge combining two separate expressions, as in (12), then in the absence of special constraints, it will also have an operation of Internal Merge combining an expression with a copy of one of its constituents, as in (13).



One problem for Chomsky's argument is that the main alternatives, HPSG and LFG, do not have an operation of Merge for the simple reason that they do not have any operations. They are not procedural approaches, in which an expression is well formed if it is the product of a certain set of operations, but declarative approaches, in which an expression is well formed if it conforms to all relevant constraints. See Postal (2003, section 3) for discussion of this point.⁸

As an anonymous referee has emphasized to me, one might formulate a declarative version of Minimalism, which licenses the output structures in (12) and (13) but does not view them as the product of any operation. One might then argue that a framework in which both output structures are licensed is simpler than one in which only the first is licensed. But there is no way to

⁸ Interestingly, Radford (1981: 90-91), written before Chomsky became firmly committed to a procedural idiom, advocated a declarative view of Phrase Structure rules in which they are node admissibility conditions, a notion deriving from McCawley (1968).



establish this without detailed and precise analyses within both frameworks. Unlike proponents of various other frameworks, Chomskyans do not provide detailed analyses. Rather they offer sketches of analyses, which need fleshing out in various ways. Consider, for example, *wh*-questions. A detailed HPSG analysis dealing with finite and non-finite *wh*-questions, elliptical *wh*-questions, and echo questions is developed in Ginzburg and Sag (2000) and set out in a 50 page appendix. There is nothing comparable within the Chomskyan mainstream.⁹ Until Chomskyan grammar fragments are available, there is no reason to take Chomsky's argument seriously.

Rather like his simplicity argument is Chomsky's argument that movement is conceptually necessary. He asserts that:

the radically simplified form of transformational grammar that has become familiar ('Move a' and its variants) is a kind of conceptual necessity (Chomsky 2001b: 8–9, note 29).

Given that a variety of frameworks make no use of movement, it cannot possibly be conceptually necessary. Why then does Chomsky produce such an argument? Postal makes a relevant comment:

One can hardly fail to suspect that the reason for this is that those who invoke 'conceptual necessity' for appeal to transformational mechanisms are aware of their inability to argue for their adoption on genuine substantive grounds (Postal 2003: 613).

The strongest empirical argument for movement comes from filler-gap dependencies. *Wh*-questions are a major example, and it is not surprising that Radford (1981) used them as the basis of an argument for movement. They are the focus of the next section.

3. Filler gap dependencies

Filler-gap dependencies involve a clause-initial phrase of some kind and a gap somewhere in the following clause. A typical example is the bracketed *wh*-question in (14), where the filler is *who* and the gap, indicated by '___', is in prepositional object position.

(14) I wonder [who Kim talked to ___].

⁹ This contrast also shows up in textbooks. Sag, Wasow and Bender's (2003) introduction to HPSG sets out the grammar fragment developed in the book in a 33 page appendix. Appendices of this kind are not found in introductions to Chomskyan work for the simple reason that they do not develop grammar fragments.



Filler and gap are mutually dependent in the sense that normally neither is possible without the other. In the case of (14) ungrammaticality results if the gap is filled in some way or if the filler is omitted.

(15) *I wonder [who Kim talked to him].

(16) *I wonder [Kim talked to ____].

Moreover, filler and gap normally match. They are the same category, as is shown the following, where the category of filler and gap is indicated, and where I use the label NP for what most Chomskyans would view as a DP:

- (17) a. [NP Who] did Kim talk to ____ (NP)?
b. [PP To whom] did Kim talk ____ (PP)?
c. [AP How long] is a piece of string ____ (AP)?
d. [AdvP How quickly] did you do it ____ (AdvP)?

If they are nominal, they match in number, as the following illustrate:

- (18) a. [NP[SING] Which student] do you think ____ (NP[SING]) knows the answer?
b. [NP[PLUR] Which students] do you think ____ (NP[PLUR]) know the answer?

In languages with morphological case or grammatical gender they share these properties as well. The first of these is illustrated by the following Polish examples:

- (19) a. Co dałeś ____ (NP[ACC]) Janowi?
 what-ACC give-PAST-2SGM Jan-DAT
 'What did you give to Jan?'
b. Komu dałeś książkę ____ (NP[DAT])?
 who-DAT give-PAST-2SGM book-ACC
 'Who did you give a book to?'

In (19a) the filler is accusative and so is the gap, while in (19b) the filler is dative and the gap is too.

Within all versions of TG, the filler originates in the position of the gap and is moved to its superficial position by what has been known since the 1980s as A'-movement. Thus, (14) has the following schematic analysis:¹⁰

(20) I wonder [who Kim talked to ____]
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On this approach, it is only to be expected that neither filler nor gap can appear without the other and it is only to be expected that they will match. This is an attractive approach. However, it becomes less attractive when a broader range

¹⁰ It would normally be assumed that there are two movements here, one to the edge of *v*P and one to Spec CP. See the discussion of (3) above.



of data is considered. If you consider enough data, it begins to look quite problematic.

Before we consider the types of data that casts doubt on a movement approach to filler-gap dependencies, it should be noted that there are a number of alternatives to movement. Categorical Grammar uses functional composition (Steedman 2000). LFG uses functional uncertainty (Bresnan 2000: chapter 4.8). Finally, HPSG, building on earlier work in Generalized Phrase Structure Grammar, employs the SLASH feature (Gazdar 1981, Gazdar *et al.* 1985, Ginzburg and Sag 2000, Koster 2000). If theoretical linguistics was a more serious discipline than it is, there would be extensive efforts to determine the relative merits of the various approaches. In fact, there is very little of this. Chomskyans generally make no mention of other approaches, apparently preferring not to give them the oxygen of publicity.¹¹ It is more common for proponents of other approaches to consider Chomskyan work, but even here there is not very much comparative discussion. The present paper is a small contribution to the kind of discussion that is necessary.

4. Problems

In this section, I will show that the movement approach to filler-gap dependencies faces a variety of problems. In particular, I will show that it has problems with four types of example. With one type there is a generally accepted solution, but it is one that should be questioned. With two other types solutions have been suggested, but they seem quite dubious. As far as I am aware, the final type has not received any attention within movement-based approaches, and the only way of dealing with it that I can think of does not look at all promising.

4.1. Examples where there is no visible filler

One problem for a movement approach comes from examples which look as if they involve a filler-gap dependency but where there is no visible filler.

Zero relatives provide one apparent example. If *which* is a filler in the *wh*-relative in (21), it looks as if there is no filler in the zero relative in (22).

(21) the book [which Kim bought ____]

(22) the book [Kim bought ____]

¹¹ Radford (2004) and Radford (2009) are somewhat unusual in citing a number of dissenters, e.g. Lappin, Levine and Johnson (2000) and Pullum and Scholz (2002).





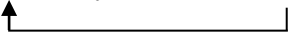
On the head-raising view of relative clauses developed by Kayne (1994) and others, *book* is the filler in (22). But this suggests that *book* has a different status in the two examples. Kayne is happy to accept this conclusion, and so are Aoun and Li (2003), for whom *book* is moved in (22) but base-generated in (21). The idea that *book* is a filler in an example like (22) faces a number of other problems. For example, it may have a different case from the gap. This is clear in a language that has overt case marking, for example, Polish, where we have examples like the following:

- (23) Kupiłem książkę, co ___ była droga.
 bought-1SGM book-ACC COMP be-PAST-3SGF expensive
 'I bought a book Kim bought was expensive.'

Here *książkę* is accusative, but the position from which it has moved on a head-raising analysis is nominative.¹² On a more traditional view, *book* originates in its superficial position in both (21) and (22), and only (21) has a visible filler. An example like (22) is assumed to have an invisible filler, a so-called 'empty operator'. This position is widely assumed in textbooks, e.g. Radford (2009: 5.10). On this view, (22) has the following analysis:

- (24) the book [O Kim bought ___]


Whatever analysis is assumed for zero relatives, it is generally accepted that there is no visible filler in a variety of other constructions, and empty operator analyses are standard here. The following, which have the analyses illustrated, are three examples:

- (25) a. Lee is too important [O for you to talk to ___].

 b. Lee is important enough [O for you to talk to ___].

 c. Kim is easy [O for anyone to talk to ___].


Thus, the movement of invisible elements is a prominent feature of mainstream analyses.

What can we say about such analyses? Unless there is some independent evidence for empty operators, they are little more than an ad hoc device to maintain a movement approach. Attempts have been made to provide independent evidence for various empty categories (see e.g. Featherston 2001), but, as far as I am aware, there have been no attempts to provide independent

¹² See Borsley (1997, 2001b) for critical discussion of the head-raising analysis of relative clauses.





evidence for these empty categories. Thus, the empty operator analysis seems quite dubious.¹³

4.2. Examples with more than one gap

A second problem comes from examples which look as if they involve a filler-gap dependency but where there are two or more gaps. There are two types of example here. On the one hand, there are across-the-board (ATB) cases with gaps in two (or more) conjuncts, where both (or all) seem to be necessary.¹⁴ The following illustrate:

- (26) a. Who does Kim like ___ and Lee hate ___?
 b. *Who does Kim like Sandy and Lee hate ___?
 c. *Who does Kim like ___ and Lee hate Sandy?

On the other, there are parasitic gap cases, where one gap seems to depend on the other:

- (27) a. Which book did you criticize ___ without reading ___?
 b. *Which book did you criticize *Barriers* without reading ___?
 c. Which book did you criticize ___ without reading *Barriers*?

Both types of example provide an important challenge for movement-based approaches, as has been pointed out since Gazdar (1981).

Within a movement approach, one possibility is to assume that only one gap is the result of moving the filler while the other is the result of moving an empty operator. This approach is taken to parasitic gap sentences in Chomsky (1986). Chomsky suggests that reflexives provide evidence that only ordinary, non-parasitic gaps are directly connected to the filler, citing contrasts like the following:

- (28) a. Which books about himself did John file ___ before Mary read ___?
 b. *Which books about herself did John file ___ before Mary read ___?

¹³ Apparent psycholinguistic evidence for the existence of invisible elements in gap sites such as that discussed in Featherston (2001) is sometimes seen as evidence for a movement approach. Such elements have been an important feature of movement approaches. However, as discussed in section 5, it is possible to assume empty categories in gap sites in a non-movement approach. Hence, if there is a real evidence for such elements, it does not provide any motivation for a movement approach.

¹⁴ Work by Goldsmith (1985), Lakoff (1986), and Kehler (2002) has shown that it is sometimes possible to have a gap in just one conjunct. (i), for example, seems fine.

(i) How many courses can we expect our graduate students to [[teach ___] and [still finish a dissertation on time]]?

However, this is not particularly important in the present context. See Chaves (2012) for recent discussion.

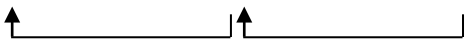


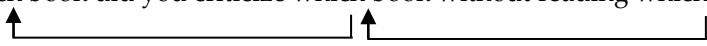
However, as Nunes (2001: fn.35) points out a parasitic gap may behave in this way if it precedes the ordinary gap.

- (29) a. *Which picture of herself did every boy who saw ___ say Mary liked ___?
b. Which picture of himself did every boy who saw ___ say Mary liked ___?

Similar data is discussed in chapter 1 of Levine and Hukari (2006), who argue that there is no fundamental difference between ordinary gaps and parasitic gaps.¹⁵

An alternative is to assume that the filler moves from one gap position to the other before eventually moving to its superficial position. This is the approach that is developed in Nunes (2001). It means that the following involve the movement processes indicated.¹⁶

- (30) Who does Kim like ~~who~~ and Lee hate ~~who~~?
- 

- (31) Which book did you criticize ~~which book~~ without reading ~~which book~~?
- 

A problem for this approach comes from the fact that the two gaps may be associated with different cases, as in (32).

- (32) Who do you think [Kim likes ___(ACC) and believes ___(NOM) would be a good candidate]?

It is not clear how such examples can be handled within a movement approach.

It seems, then, that examples with more than one gap present a serious problem for movement approaches to filler-gap dependencies.

4.3. Examples with non-matching gaps

A further problem arises with examples which look as if they involve a filler-gap dependency but where what looks like a filler does not match what looks like the associated gap. There are in fact a variety of examples of this kind, and it may well be that some of them are no real problem. Consider, for example, the following (drawn to my attention by Pullum 2009):

- (33) Good linguist though he is ___, ...

On Chomskyan assumptions, the gap here is a DP, but the filler doesn't look like a DP. Rather it looks like what for Chomskians is an NP, the type of phrase that appears as the complement of D. So it looks as if filler and gap do not

¹⁵ See also Levine and Sag (2003) and Levine (2004).

¹⁶ For Nunes, the filler moves from one gap position to the other before the constituents that contain the positions are combined into a single structure, but this is not particularly important in the present context.



match. One might propose, however, that the filler here is in fact a DP whose head has been deleted, making it look like an NP. On this view, examples like (33) are no real problem.

There is, however, at least one type of example which seems quite problematic. This is what Arnold and Borsley (2010) call auxiliary-stranding relative clauses (ASRCs). The following illustrate:

- (34) a. Kim will sing, which Lee won't ____.
b. Kim has sung, which Lee hasn't ____.
c. Kim is singing, which Lee isn't ____.
d. Kim is clever, which Lee isn't ____.
e. Kim is in Spain, which Lee isn't ____.
f. Kim wants to go home, which Lee doesn't want to ____.

Each of these examples contains a non-restrictive relative clause introduced by *which* and a gap which is the complement of an auxiliary. They look rather like sentences involving VP-ellipsis, or auxiliary complement ellipsis in Warner's (2000) more appropriate terminology.

- (35) a. Kim will sing, but Lee won't.
b. Kim has sung, but Lee hasn't.
c. Kim is singing, but Lee isn't.
d. Kim is clever, but Lee isn't.
e. Kim is in Spain, but Lee isn't.
f. Kim wants to go home, but Lee doesn't want to.

It is clear, however, that there is a dependency here. Thus, it is not possible to replace the gap by an overt constituent:

- (36) a. *Kim will sing, which Lee won't sing.
b. *Kim has sung, which Lee hasn't sung.
c. *Kim is singing, which Lee isn't singing.
d. *Kim is clever, which Lee isn't clever.
e. *Kim is in Spain, which Lee isn't in Spain.
f. *Kim wants to go home, which Lee doesn't want to go home.

Moreover like other filler-gap dependencies it is subject to island constraints. The examples in (37) and (38) show that ASRCs are subject to the Complex Noun Phrase Constraint and the Coordinate Structure Constraint.

- (37) a. Kim is singing, which I don't believe that Lee is.
b. *Kim is singing, which I don't believe the claim that Lee is.
- (38) Kim has never ridden a camel, which
a. Sam has ____ and Bill probably will ____.
b. *Sam has ____ and Bill probably will ride one/a camel.



At least normally *which* is a nominal constituent, either a DP or an NP depending on the approach one favours, but the gaps are non-nominal, as the following show:

- (39) a. *Kim will sing, but Lee won't it/that.
b. *Kim has sung, but Lee hasn't it/that.
c. *Kim is singing, but Lee isn't it/that.
d. *Kim is clever, but Lee isn't it/that.
e. *Kim is in Spain, but Lee isn't it/that.
f. *Kim wants to go home, but Lee doesn't want to it/that.

In (a), (b), (c) and (f) the gap is a VP of some kind, in (d) it is an AP, and in (e) it is a PP. It looks, then, as if we have a clear contrast between the apparent filler and the associated gap.

One response to these data might be to propose that *which* in these examples is not the normal nominal *which* but a pronominal counterpart of the categories which appear as complements of an auxiliary, mainly various kinds of VP. But ordinary VP complements of an auxiliary cannot appear as fillers in a relative clause, as shown by the (b) examples in the following:

- (40) a. This is the book, which Kim will read ____.
b. *This is the book, [read which] Kim will ____.
- (41) a. This is the book, which Kim has read ____.
b. *This is the book, [read which] Kim has ____.
- (42) a. This is the book, which Kim is reading ____.
b. *This is the book, [reading which] Kim is ____.

Moreover, there is evidence that *which* is nominal here as elsewhere from examples like the following:

- (43) Kim has often ridden a camel, which most people haven't ____, and some consider ____ too dangerous.

Here the second gap is clearly in a nominal position. It looks very much, then, as if we have a filler-gap dependency here where filler and gap do not match.

Some evidence that this is the right conclusion comes from similar examples with a topicalized demonstrative pronoun. Here are some naturally occurring examples:

- (44) a. They can only do their best and that they certainly will ____.
(http://www.britishcycling.org.uk/web/site/BC/gbr/News2008/200807018_Jamie_Staff.asp)
b. Now if the former may be bound by the acts of the legislature, and this they certainly may ____, ...
(Thomas Christie (1792) *The Analytical Review, or History of Literature, Domestic and Foreign, on an Enlarged Plan*, p. 503 (Princeton University))



c. It was thought that he would produce a thought provoking chapter, and this he certainly has ____.

(J. B. Cullingworth, ed. *British Planning: 50 years of Urban and Regional Policy*, Continuum International Publishing Group, 1999, p13).

It does not seem to be possible to have *it* as a filler in an example like an ASRC:

- (45) a. *Kim will sing, but it Lee won't ____.
b. *Kim is clever, but it Lee isn't ____.
c. *Kim is in Spain, but it Lee isn't ____.

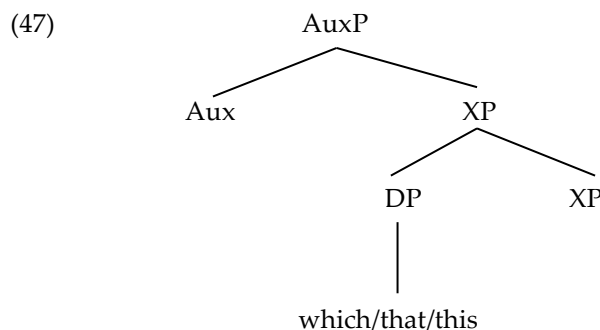
However, it seems to be generally impossible to have *it* as a filler:

- (46) *Kim likes beer, but it Lee doesn't like ____.

It looks, then, as if we don't need any special statement to rule out the examples in (45).

ASRCs and related examples where filler and gap do not match pose a serious problem for the movement approach to filler-gap dependencies given that matching between filler and gap is an automatic consequence of such an approach.

I am not aware of any discussions of ASRCs within a movement approach. However, one might try to accommodate the data by allowing the complement of an auxiliary to have a DP realized as *which* or *that* adjoined to it, as in (47).



The complement would have to be deleted in this situation. However, it is not clear how one could ensure that deletion applies. Hence, it is not clear how one could exclude the following.

- (48) *Kim will sing, which Lee won't sing.

It is also not clear how one could ensure that a demonstrative introduced in such a structure is fronted. In other words, it is not clear how an example like the following, with or without *sing*, could be excluded.

- (49) *Kim will that/this (sing).

Thus, ASRCs appear to pose a serious problem for movement approaches.



4.4. Examples with no gaps

Just as there are examples which look as if they involve a filler-gap dependency but have no visible filler, so there are examples which have no visible gap. Instead they have a resumptive pronoun (RP). Among many languages that are relevant here is Welsh, which has examples like the following, where the RP is in bold:

- (50) y dyn werthodd Ieuan y ceffyl iddo **fo**
the man sell-PAST-3SG Ieuan the horse to-3SGM he
'the man that Ieuan sold the horse to'

Here the RP is in a relative clause. RPs also occur in *wh*-questions such as the following:¹⁷

- (51) Pa ddyn werthodd Ieuan y ceffyl iddo **fo?**
which man sell-PAST-3SG Ieuan the horse to-3SGM he
'Which man did Ieuan sell the horse to?'

As McCloskey (2006) notes, dependencies with an RP have often been seen by Chomskyans as a different kind of dependency not involving movement. However, this position seems untenable in some languages. One of them is Welsh.

Willis (2000) argued that Welsh dependencies with an RP do not involve movement on the basis of an interesting fact about the verb *bod* 'be'. Welsh does not allow present and imperfect forms of *bod* 'be' in affirmative declarative complement clauses. Hence, the following, in which the crucial forms are in bold, are ungrammatical:

- (52) a. *Mae Aled yn credu [y **mae** Elen yn darllen y llyfr].
be-PRES-3SG Aled PROG believe PRT be-PRES-3SG Elen PROG read thebook
'Aled believes that Elen is reading the book.'
b. *Mae Aled yn credu [**roedd** Elen yn darllen y llyfr].
be-PRES-3SG Aled PROG believe be-IMPF-3SG Elen PROG read the book
'Aled believes that Elen was reading the book.'

Instead what looks like the non-finite form *bod* appears:

- (53) Mae Aled yn credu [**bod** Elen yn darllen y llyfr].
be-PRES-3SG Aled PROG believe be Elen PROG read the book
'Aled believes that Elen is/was reading the book.'

Filler-gap dependencies nullify this ban on present and imperfect forms of *bod*:

¹⁷ In Literary Welsh an alternative to (51) with a PP filler, as in (i), is preferred.

(i) I ba ddyn werthodd Ieuan y ceffyl?
to which man sell-PAST-3SG Ieuan the horse
'To which man did Ieuan sell the horse?'



- (54) a. Beth mae Aled yn credo [y mae Elen yn
what be-PRES-3SG Aled PROG believe PRT be-PRES-3SG Elen PROG
ei ddarllen ___]?
3SGM read
'What does Aled believe that Elen is reading?'
- b. Beth mae Aled yn credo [roedd Elen yn ei
what be-PRES-3SG Aled PROG believe be-IMPF-3SG Elen PROG 3SGM
ddarllen ___]?
read
'What does Aled believe that Elen was reading?'

Willis (2000: 556) claims that it is only filler-gap dependencies involving a gap that have this effect. He cites (55) as evidence that dependencies involving an RP do not nullify the ban:

- (55) *Pa lyfrau wyt ti 'n meddwl [oedden nhw 'n addas]?
which books be-PRES-2SG you-SG PROG think be-IMPF-3PL they PRED suitable
'Which books do you think were suitable?'

However, this has an RP in an embedded subject position. There is independent evidence that RPs are barred from this position. Consider instead the following examples:

- (56) y llyfr mae pawb yn dweud [mae / roedd Mair
the book be-PRES-3SG everyone PROG say be-PRES-3SG/be-IMPF-3SG Mair
yn sôn amdano fe]
PROG talk about-3SGM he
'the book that everyone says Mair is/was taking about'
- (57) y dyn mae pawb yn dweud [mae / roedd
the man be-PRES-3SG everyone PROG say be-PRES-3SG be-IMPF-3SG
ei dad o 'n glyfar]
3SG father he PRED clever
'the man whose father everyone says is/was clever'

These examples have RPs in positions in which they are unproblematic, prepositional object position and possessor position, respectively. They show clearly that dependencies with an RP nullify the ban on present and imperfect forms of *bod* just as much as dependencies with a gap do.

Further evidence that Welsh dependencies with an RP have the same basic properties as dependencies with a gap is presented in Willis (2011) (which abandons the position of Willis 2000) and Borsley (2010). Hence, at least in Welsh, it seems that a movement approach must assume movement in sentences with an RP.

How could we combine movement with an RP? Given the standard Minimalism assumption that movement leaves a copy, one might suggest that under certain circumstances the copy is not deleted but is somehow converted



into a pronoun. A version of this approach is sketched in McCloskey (2006).¹⁸ He considers the following English example:

(58) I wonder which word they are not sure how it's spelled.

Here the moved constituent is *which word*, which on standard Minimalist assumptions is a DP headed by *which*. McCloskey suggests an analysis in which the complement *word* is deleted and *which* is realized as *it* as a result of the deletion of its 'WH-feature'.

This approach faces a number of problems. Firstly, it is not really clear what a WH-feature is¹⁹ or what ensures that it is deleted. Secondly, it is fairly clear that more than just the deletion of this feature is required in Welsh. In Welsh, agreement is generally triggered by pronouns but not by non-pronominal noun phrases. The examples in (50) and (51) show that prepositions agree with an RP. The following show that prepositions do not agree with a non-pronominal noun phrase:

(59) a. i Mair b. am Mair
 'to Mair' 'about Mair'

The following show that *wh*-elements are non-pronominal:

(60) a. i bwy b. am bwy
 'to whom' 'about whom'

It seems, then, that any process that derives RPs from copies will need not just to delete a WH feature but also to change [-PRO] to [+PRO].

Arguably the most serious objection to this approach arises from McCloskey's (2002: 192) observation that RPs universally look just like ordinary pronouns. This casts doubt on any analysis which treats them as special pronouns distinct in some way from ordinary pronouns. An analysis in which they are the result of the modification in PF of DPs which may be non-pronominal seems to be a clear example of an analysis of this kind. McCloskey himself argues in McCloskey (2006) that 'there can be no syntactic feature which distinguishes resumptive pronouns from 'ordinary' pronouns'. An analysis in which RPs only have the feature makeup of pronouns in PF looks like a straightforward violation of this principle.

Thus, it seems that an approach in which RPs are the realization of copies left by movement faces a variety of problems. It looks, then, as if a transformational approach needs to find some other way to combine movement with RPs. One alternative is sketched in Willis (2011). He proposes that a PP

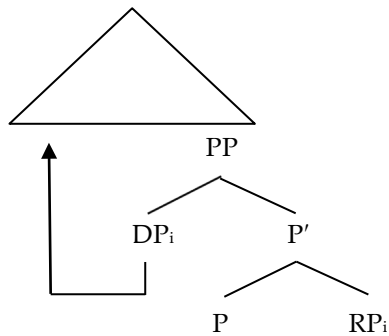
¹⁸ A similar approach was advocated in Pesetsky (1998). McCloskey (pc) emphasizes that this is not an approach he favours.

¹⁹ See Sag (2010: 491-3) for some discussion of the concept of a 'WH-expression'.



whose head has an RP as its object may have a coindexed operator in its specifier position, which undergoes A'-movement.

(61)



On this analysis RPs are ordinary pronouns. Hence, it is immune to what is arguably the most important objection to an analysis in which RPs are the realization of copies left by movement. However, a question arises about the specifier position which it requires. There does not seem to be any independent motivation for this position. In English, what Culicover (1999) calls sluice-stranding, exemplified by the following, seems to provide some support for a Spec PP position.

- (62) a. Who with?
 b. What about?
 c. Who for?

It seems that Welsh does not have examples like this. It is also not clear what ensures that an expression is only merged in this specifier position if there is nearby pronoun that it is coindexed with. Thus, Willis's approach faces two objections.

Other ways of combining movement with RPs have been suggested in the literature.²⁰ However, it is not clear that there is any satisfactory way to do this.

4.5. Implications

It seems, then, that there are at least four types of example which make a movement approach to filler-gap dependencies a lot less attractive than it initially appears. A response which some Chomskyans might favour would be to stipulate that these phenomena are all part of the periphery, which can safely

²⁰ Aoun, Choueiri and Hornstein (2001) propose that a moved constituent may originate as the specifier of an RP, while Boeckx (2003) proposes that RPs are transitive determiners whose NP complement undergoes movement. At least in the case of Welsh these proposals involve structures for which there is no independent motivation.



be ignored.²¹ Such a response might appeal to someone influenced by Chomsky's (1980) contention that '[a]pparent counterexamples and unexplained phenomena should be carefully noted, but it is often rational to put them aside pending further study when principles of a certain degree of explanatory power are at stake'. However, this is not a response that would appeal to Andrew Radford, who has always taken data very seriously.²² I will assume that the phenomena that I have discussed here cannot just be put aside and that they should play an important role in the assessment of approaches to filler-gap dependencies. I conclude that they cast considerable doubt on the movement approach.

5. An alternative

As noted above, a variety of alternatives to movement have been developed since about 1980. Chomsky sometimes seems to suggest that any account of phenomena like filler-gap dependencies is really a form of movement. Thus, Chomsky and Lasnik (1995: 25) remark that transformational rules 'appear to be unavoidable in one or another form, whether taken to be operations forming derivations or relations established on representations'.²³ If this was right, phenomena that are problematic for movement would be equally problematic for the alternatives. But this is not the case. I will concentrate here on the SLASH-based approach to filler-gap dependencies first proposed by Gerald Gazdar and subsequently developed first within Generalized Phrase Structure Grammar and then in HPSG. I will show that the phenomena that pose problems for a movement-based approach are unproblematic for this

²¹ This response presupposes that there is a clear distinction between the core and the periphery. Culicover (1999) argues persuasively that there is a no clear distinction.

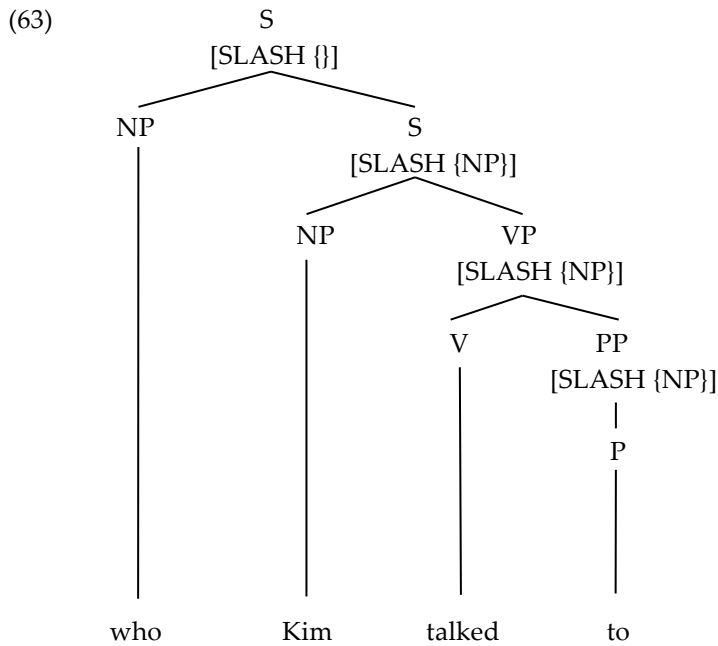
²² It has always seems rather strange to me that someone so interested in data should be so firmly allied with a theoretical framework which is so ambivalent about data. But there are many strange things in Linguistics.

²³ This is a very odd suggestion. As Bob Levine (pc) points out, 'one might argue with exactly the same degree of justice that the binding theory introduced in *Lectures on Government and Binding* (Chomsky 1981) was substantively no different from the cyclical rules of pronominalization that Ross and others had been advocating throughout the late 1960s, or that the use of PRO to account for the semantic and syntactic properties of putative clauses with missing subjects was nothing other than a disguised version of the Equi NP Deletion assumed since the early work of Rosenbaum on infinitival complementation. In not one of these cases did Chomsky believe that transformational treatments of the various phenomena involved 'were unavoidable in one or another form, etc. ...'. So why here?'

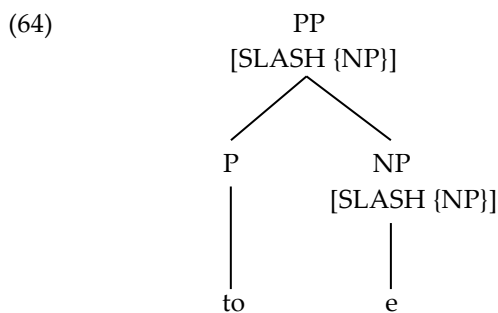


approach. I leave it to others to consider how the other alternative approaches mentioned earlier might handle the problematic data.

As it has developed since the mid 1980s the SLASH-based approach involves a feature SLASH, which makes certain information available higher and lower in the structure than normal.²⁴ This includes but is not limited to information about fillers and gaps. Various constraints ensure that all positions between the filler and the gap have an appropriate SLASH value. Thus, the subordinate clause in (14) has something like the following analysis:



In some HPSG work, e.g. Ginzburg and Sag (2000), gaps are analysed as missing elements, as here. In this approach they are only represented in the value of the head's ARG-ST (ARGUMENT-STRUCTURE) feature. In other work, e.g. Levine and Hukari (2006), they are analysed as empty categories. On this view the PP has the following form:



²⁴ Instead of categories of the form X[SLASH {Y}], Gazdar's earliest work had categories of the form X/Y. This is where the name SLASH comes from.

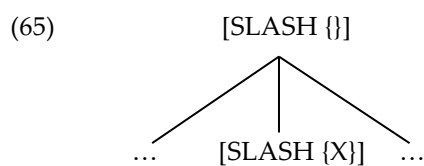


It is not particularly important in the present context which of these views is adopted.²⁵ A further point to note is that it is standardly assumed that the sharing of SLASH values between a phrase and a non-head daughter is via the head. On this view, V in (63) and P in (64) will all be [SLASH {NP}]. This will be important when we return to resumptive pronouns.

One more point that we should note here is that the sort of phenomena that are seen by Chomskyans as evidence for successive cyclic movement are unproblematic for this approach. These are phenomena that show up between filler and gap. Given that all positions between the filler and the gap have a non-empty SLASH value such phenomena are only to be expected. See e.g. Bouma, Malouf and Sag (2001: 3.2) for discussion.

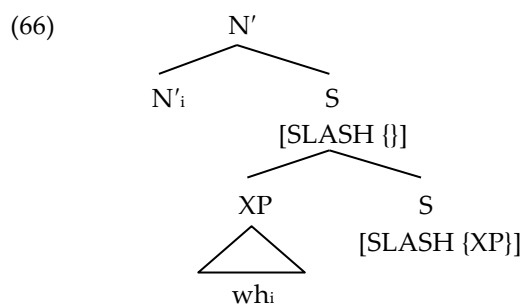
I will discuss each of the phenomena that pose problems for a movement-based approach in the following pages.

Examples where there is no visible filler are no problem for this approach. There is no reason why the information made available by the SLASH feature should always be associated with a filler. The top of a SLASH dependency takes the following form:



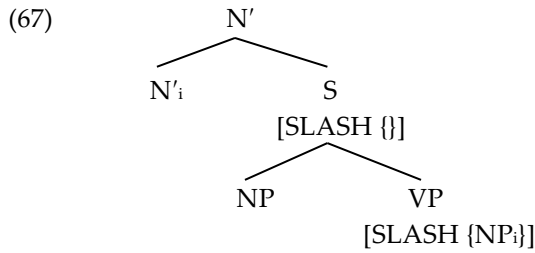
There is no reason why there should always be a filler as a sister of the [SLASH {X}] constituent.

In the case of relative clauses, there will be a filler in a *wh*-relative, which will have a structure of the form in (66), but no filler in a zero relative, which will have a structure of the form in (67).



²⁵ I argue in Borsley (2009) that there is evidence for the second view of gaps in Welsh.

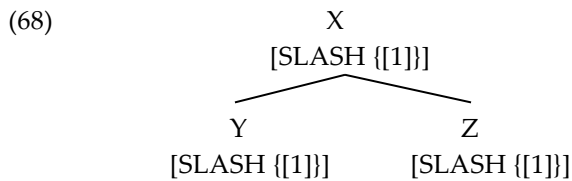




An analysis of English relative clauses along these lines, which also deals with *that* relatives and non-finite relatives, is developed in Sag (1997).

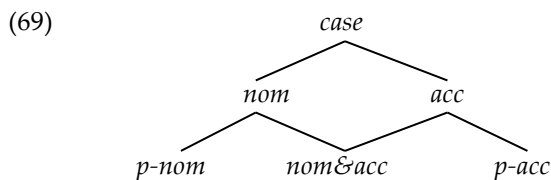
Like zero relatives the various constructions in (25) will involve a structure of the form in (65) where there is no filler.

There is also no problem with examples with more than one gap. There is no reason why the information that SLASH encodes should only be associated with a single gap. There is no reason, that is, why we should not have structures like the following:



If Y and Z are two conjuncts, this will be an ATB case. If one is a head and the other a dependent, the former will contain an ordinary gap, and the latter a parasitic gap. It would in fact require a special stipulation to rule out structures like (68). Thus, not only are examples with two gaps not a problem, we actually expect them.²⁶

What about examples like (32), where a single filler is associated with one accusative gap and one nominative gap? Here, Levine, Hukari and Calcagno (2000) show that these are no problem if the feature CASE has the following system of values (where *p-nom* is 'pure' nominative and *p-acc* 'pure' accusative):



Given this system *he* will be [CASE *p-nom*] and hence will not be able to be associated with a [CASE *acc*] position, and *him* will be [CASE *p-acc*] and hence will not be able to be associated with a [CASE *nom*] position, but *who* will be

²⁶ In a language which doesn't allow parasitic gaps a stipulation is necessary to exclude them. One such language is Welsh, as discussed in Borsley (2010).



[CASE *nom&acc*] and hence will be able to be associated with both types of position.

Examples with non-matching gaps are also no problem. Gaps normally have the following feature-makeup.

$$(70) \quad \begin{bmatrix} \text{LOCAL} [1] \\ \text{SLASH} \{[1]\} \end{bmatrix}$$

Here, the value of LOCAL, which encodes the main syntactic and semantic properties of an expression, also appears in the value of SLASH. This ensures that information about the main syntactic and semantic properties of the gap is available higher in the tree. As noted by Webelhuth (2008), there is no reason why we should not under some circumstances have ‘dishonest gaps’, where the value of SLASH is different from that of LOCAL. There is no reason, that is, why we shouldn’t have gaps with a feature-makeup of the following form:

$$(71) \quad \begin{bmatrix} \text{LOCAL} [1] \\ \text{SLASH} \{[2]\} \end{bmatrix}$$

This is the approach to ASRCs which is developed in Arnold and Borsley (2010). They propose that when an auxiliary has an unrealized complement, the complement optionally has a certain kind nominal as the value of SLASH, which is realized as relative *which* or a demonstrative. When SLASH has the empty set as its value, the result is an auxiliary complement ellipsis sentence. When SLASH has the nominal value, we have a dishonest gap because the value of LOCAL is whatever the auxiliary requires, normally a VP of some kind, and the result is an ASRC.

Finally, examples with no gaps are no problem. Just as there is no reason why a non-empty SLASH should always be associated with a filler, so there is no reason why it should always be associated with a gap. We can assume that some languages allow certain heads that are [SLASH {NP_i}] to be associated not with a gap but with a pronominal sister coindexed with the value of SLASH (which must be nominal for coindexing to be possible). In other words we can assume that they have structures of the following form:

$$(72) \quad \begin{array}{c} \text{XP} \\ \text{[SLASH \{NP}_i\}] \\ \swarrow \quad \searrow \\ \text{X} \quad \text{NP}_i \\ \text{[SLASH \{NP}_i\}] \quad \text{[+PRO]} \end{array}$$

Borsley (2010) develops an analysis of Welsh RPs along these lines, in which prepositions and nouns, but not verbs and adjectives appear in structures of this kind. A verb or adjective with a non-empty SLASH value has an argument





which is a gap or one which contains a gap or a resumptive pronoun, while a preposition or noun with a non-empty SLASH value has an argument which is a coindexed pronoun or one which contains a gap or a resumptive pronoun. This is a straightforward extension of standard HPSG analyses.

Thus, all four of the example types that call the movement approach into question are unproblematic for the SLASH approach. In terminology that Andrew Radford might like, the SLASH approach wins 4-0.

6. Conclusions

In this paper I have investigated the motivation for the movement operations which are ubiquitous in mainstream Chomskyan syntax but rejected by all the main alternative frameworks. I have focused in particular on filler-gap dependencies, which for Chomskians involve A'-movement and provide the strongest evidence for movement. I have shown that while the movement approach is initially attractive, there are at least four types of example that cast serious doubt on it. I have also shown that all four types of example are unproblematic for the SLASH approach to filler-gap dependencies developed in HPSG. The conclusion that the SLASH approach is superior to the movement approach seems inescapable.

In a sense this paper is quite limited in scope. I have considered just one type of movement and I have just argued that one alternative provides a superior account of the relevant data. There are, of course, other kinds of movement assumed within the Chomskyan mainstream. In particular, there is A-movement, assumed in passives and raising, and head-movement, which is assumed to be responsible for the position of verbs and nouns in various languages. However, as I have emphasized, filler-gap dependencies provide the strongest argument for movement. Hence, if movement is not the right approach to take to filler-gap dependencies, then it is unlikely that it is the right approach to take in any other area. As I noted in section 3, there are other approaches to filler-gap dependencies. I have not considered how these might deal with the data highlighted in section 4. However, this is not particularly important. As long as there is one alternative that provides a better account of the facts than movement, that is a reason for rejecting movement. So I conclude with a piece of advice for syntacticians: whatever you do, don't move!





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Robert D. Borsley

rborsley@essex.ac.uk

University of Essex

