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REVIEW ARTICLE

Why do we need another book about unbounded dependencies? A review article on Chaves & Putnam's *Unbounded Dependency Constructions*¹

ROBERT D. BORSLEY 

University of Essex & Bangor University

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Rui P. Chaves & Michael T. Putnam, *Unbounded dependency constructions: Theoretical and experimental perspectives* (Oxford Surveys in Syntax and Morphology 10). Oxford: Oxford University Press, 2020. Pp. xiii + 307.

Unbounded dependencies (UDs), in *wh*-interrogatives, relative clauses and other constructions, have been a major focus of syntactic research for more than half a century. The most widely assumed approach analyzes them in terms of movement and views island phenomena as largely a matter of syntax. Both these positions are problematic. Moreover, they stem from assumptions that have been at the heart of syntactic theorizing for many decades. Chaves and Putnam present evidence that both the dominant approach to UDs and the general approach to syntax from which it derives are flawed. They argue for a non-movement approach to UDs and a largely non-syntactic approach to island phenomena, and for an approach to syntax which has the relation between linguistic knowledge and language use and the complexity of acceptability judgements as central concerns. Their book is an important one that could have a major impact both on research on UDs and on syntactic research more generally.

KEYWORDS: competence and performance, grammaticality and acceptability, island phenomena, unbounded dependencies

[1] I am grateful to Rui Chaves for helpful discussion of many of the issues that I am concerned with here, and for comments on an earlier version of this article. I have also benefited from the comments of Anne Abeillé and Bob Levine, and three anonymous *Journal of Linguistics* referees and the editor Hans van de Koot. Of course, I alone am responsible for what appears here.

1. INTRODUCTION

One might suppose that a syntactic phenomenon that has been a central focus of research for more than half a century would be well understood and that future research would be essentially a matter of fleshing out a generally accepted picture. Unbounded (or long distance) dependencies (UDs), a central feature of *wh*-interrogatives, relative clauses, and other unbounded dependency constructions (UDCs), have been a major concern of research in syntax since Ross (1967), and there is a massive literature on the subject. However, there is evidence that UD is not as well understood as one might suppose and that the most widely assumed approach is seriously flawed.

One might also think that even if there are problems in one area of syntactic research, the basic approach underlying the research must be broadly satisfactory. After all, syntactic theory, as it has developed since *Syntactic Structures* (Chomsky 1957), has shed light on many syntactic phenomena in many languages, and its insights have enriched descriptive grammars such as Huddleston & Pullum (2002). However, it does not follow that all is well with modern syntactic theory. In fact, there is evidence that it is problematic in a number of ways.

In the book under review, Rui Chaves and Michael Putnam (henceforth C&P) argue that the dominant approach to UD is flawed and that it is flawed because the general approach to syntax which it stems from is flawed, and they develop detailed alternatives. There have been many criticisms of mainstream Chomskyan syntax in recent decades (see e.g. Postal 2004 and Culicover & Jackendoff 2005), but the problematic features that C&P focus on are not confined to the Chomskyan mainstream, although they are probably more pronounced there than in other approaches.² The book may well help to usher in a new approach to research on UD and to syntactic research more generally. It is potentially a landmark work. This, then, is the justification for another book dealing not with specific UDCs or with UD in some not so well studied language but with UD in a general way.

In the following pages, I will consider the issues in a general way first and then look in some detail at how C&P address them.

2. THE MOVEMENT APPROACH TO UNBOUNDED DEPENDENCIES

Although it has been rejected by a variety of frameworks since the early 1980s, movement is still the favoured approach to UD within the Chomskyan mainstream. By movement, I mean any mechanism which allows a constituent to occupy one position at one stage of a derivation and a different position at a later stage. This could be classical transformational rules, a general Move operation, or Internal

[2] There is room for debate as to exactly what mainstream syntax includes, but I assume it does not include Head-driven Phrase Structure Grammar, Lexical Functional Grammar, or Categorical Grammar. It has always been the most widely assumed variety of formal syntax, but of course there is also a lot of informal work in syntax with descriptive or typological goals.

Merge, i.e. Copy + Merge, followed by deletion. One anonymous referee objects to the suggestion that Internal Merge is a form of movement but without really explaining why. It has essentially the same effect as earlier mechanisms, and seems to face exactly the same problems. So when I refer to movement in the following pages, this includes Internal Merge.

Movement looks like an obvious approach if one just looks at the simplest examples. Consider, for example, (1):

(1) Kim we can always rely on ____.

Here, there is an extra clause-initial constituent, *Kim*, commonly called a filler, and a gap following *on* in the sense that a normally obligatory constituent is missing. Here and subsequently, I use an underscore to indicate a gap. The extra clause-initial constituent and the gap are mutually dependent in that neither can appear without the other:³

- (2) (a) *We can always rely on ____.
 (b) *Kim we can always rely on Lee.

Filler and gap can be indefinitely far apart. Thus, *Kim* in (1) could be followed by *we know* or *I think we know* or something even more complex. This is where the term unbounded dependency comes from.

Looking at an example like (1), it seems quite natural to suggest that the relation between filler and gap stems from the fact that the filler is moved to its superficial position from the gap position. Alternative approaches have long been advanced in frameworks like Generalized Phrase Structure Grammar, Head-driven Phrase Structure Grammar (HPSG), Lexical Functional Grammar (LFG), and Categorical Grammar,⁴ but movement is still the most widely assumed approach. It is often discussed as if it were an unquestionable fact about syntax. Thus, in a widely used textbook, Radford (2009: 20) writes as follows:

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

[3] There are, of course, examples with a filler-like constituent and no gap, notably examples like the following, traditionally discussed under the heading left dislocation, but they are generally not seen as examples of a UD:

(i) Kim, we can always rely on him.

[4] See e.g. Gazdar 1981 (Generalized Phrase Structure Grammar), Steedman 1987 (Categorical Grammar), Kaplan & Zaenen 1989 (LFG) and Ginzburg & Sag 2000 (HPSG).

analysis. Movement might provide one way to do this, but it can be done without movement, as e.g. Ginzburg & Sag (2000: Chapters 6, 7) show in some detail.⁵

A fundamental fact about UD's is that they are very often not as simple as (1). For example, they may have no obvious filler or no obvious gap. It is worth looking at both these matters. Consider first the following:

- (3) (a) a man [who we can always rely on ____]
 (b) a man [we can always rely on ____]

Both these examples contain a relative clause. In (3a), the relative pronoun would traditionally be viewed as a filler, but if it is, there is no obvious filler in (3b). One might suggest that *a man* (or just *man*) is the filler in (3b), but then some rethinking is required for examples like (3a). Analyses of relative clauses in which they always contain a visible filler have been developed, notably in Kayne (1994: Chapter 8), but it is by no means clear that such analyses are viable.⁶ Whatever one thinks about relative clauses, it seems clear that there are UDC's with no visible filler. Consider the following:

- (4) This problem is too important to ignore ____.

Here, there is a gap following *ignore*, but there seems to be no filler. The gap is associated semantically with *this problem*, but this is a subject and not an extra clause-initial constituent, so not a normal filler. Rather similar is the following:

- (5) This difficulty would be easy to overlook ____.

Here, there is gap following *overlook*, and again it is associated not with a normal filler but with a subject.

It has generally been accepted since Chomsky (1977) that there are UDC's with no visible filler, but within mainstream syntax it has been assumed that such constructions contain an invisible filler, either one that is deleted (the approach of Chomsky 1977) or one that is phonologically empty. This position is more or less inevitable. If UD's are the product of movement and there is no visible constituent that has been moved, there must be an invisible one. But it is only if one assumes movement that this invisible element is necessary. It is not necessary in non-movement approaches, as shown, for example, in Sag (2010: Sections 6.2–6.3), and other things being equal, approaches that do not require some invisible element must be preferable to approaches that do.⁷

[5] A referee suggests that this is potentially unfair since 'Radford could be using movement in a pretheoretical sense where movement just means "instance of displacement"'. But if this were some sort of pretheoretical description of the facts, it would be followed by a discussion of what kind of analysis might be appropriate. In fact, it is followed by a discussion of the properties of movement operations, and there is no indication that this is not the only approach that might be considered.

[6] See Borsley (1997) for some critical discussion of Kayne's proposals.

[7] As noted by Hans van de Koot, there is room for debate as to whether or not other things are equal. Similar sentiments were also expressed by an anonymous referee.

UDs with no obvious gap are not an important feature of English, but they are important in many other languages. Consider, for example, the following Welsh example:

- (6) y bêl [mae o 'n chwarae efo hi]
 the ball be.PRES.3SG he PROG play with she
 'the ball that he is playing with'

Here, the English translation has a gap following the preposition *with*, but the Welsh example has not a gap but a pronoun following the preposition *efo*. Such resumptive pronouns (RPs) are an important feature of Welsh and many other languages. At one time it was widely assumed that there was no movement in UDs with an RP. However, in many languages they share major properties with UDs with a gap, and hence should be analysed in the same way. For mainstream syntax, this means in terms of movement.

But how can there be movement when there seems to be no gap from which something could have moved? One might suggest that movement somehow leaves behind not a gap but an RP. However, as McCloskey's (2002: 192) notes, this approach cannot account for the fact that RPs universally look just like ordinary pronouns. The alternative is to propose that movement takes place not from the position where the RP appears but from a nearby position. Thus, for example, Willis (2011) proposes that Welsh examples like (6) involve movement from Spec PP. In the absence of independent evidence for a Spec PP position with relevant properties, this looks like just an ad hoc way to maintain a movement approach to UDs. Other analyses involving movement from a position near the RP are outlined in Aoun, Choueiri & Hornstein (2001) and Boeckx (2003). It may be that there are more plausible ways of combining movement with an RP in some languages (see e.g. Van Urk 2018). But the crucial point is that RPs pose no special problem for non-movement approaches to UDs. If there is no movement, there is no reason to think that there will always be gap.⁸

While examples with no obvious filler or no obvious gap cast some doubt on movement approaches to UDs, arguably more important are examples with more than one gap. They were a central focus of the earliest work on a non-movement approach to UDs, Gazdar (1981). Here is a typical example from C&P (numbers after examples refer to pages of C&P):

- (7) There was the Hungarian Revolution [which we praised ___ and mourned ___ but did nothing about ___]. (5)

[8] As noted in Borsley (2012), movement also seems to have a problem with examples where filler and gap do not match, such as the following:

- (i) (a) Kim will sing, which Lee won't ____.
 (b) Kim has sung, which Lee hasn't ____.
 (c) Kim is singing, which Lee isn't ____.

Here, the filler *which* is nominal while the gaps are VPs. It is not clear how such examples could be handled in a movement approach, but, as Arnold & Borsley (2010) show, they are unproblematic for the non-movement approach of HPSG.

This contains three gaps, following *praised*, *mourned*, *about*, and three properties are ascribed to the Hungarian Revolution: it was praised and mourned, but nothing was done about it. Such examples have had a great deal of attention in the literature. Less discussed are examples like the following:

- (8) What did Sam eat ___ and drink ___? (6)

This does not ask what it was that Sam both ate and drank. Rather it asks: what did he drink? and what did he eat? Such examples pose a major problem for a movement approach to UD's, and they figure prominently in C&P's discussion.

3. ISLAND PHENOMENA

Although filler and gap can be indefinitely far apart, there appear to be a variety of restrictions on UD's. These have generally been referred to as island phenomena, and they have been a major focus of research since Ross (1967). Here is a notable type of example:

- (9) *Who did you see [Roger and ___] yesterday? (7)

Here, the gap is one conjunct of a coordinate structure, and the example is clearly unacceptable. A paraphrase with a gap in prepositional object position is fine:

- (10) Who did you see Roger with ___ yesterday? (7)

It looks, then, as if some syntactic constraint must be responsible for the unacceptability of the example in (9).

It has generally been assumed that there are a variety of syntactic constraints in this area. For example, it was long assumed that extraction is only possible from one conjunct if there is extraction from all other conjuncts. (I will speak of extraction from now on although nothing is really extracted if there is no movement.) This idea was an important focus of Gazdar (1981). But examples like the following from Goldsmith (1985), show that it is incorrect:

- (11) How much can you [drink ___ and still stay sober]? (75)

It has also been widely assumed that extraction is not possible from a subject. The following, from Huddleston, Pullum & Peterson (2002: 1093) shows that this is quite possible:

- (12) They have eight children of whom [five ___] are still living at home. (77)

It has also been quite widely claimed that extraction is not possible from an adjunct, but an example like (12) from Hegarty (1990) shows that this is not correct:

- (13) Who did you go to Girona [in order to meet ___]? (87)

Probably no one thinks that syntax is irrelevant to island phenomena, and probably no one thinks they are entirely a matter of syntax. Hence, the question is not whether island phenomena are syntactic or not but how large or how small the role of syntax is. It seems that the mainstream view is still that syntax plays a very major role. One referee questions this, suggesting that ‘the “mainstream view” is that syntactic theories of locality have mainly walked away from island phenomena, leaving them to nonsyntactic or interface-based accounts’. However, another referee suggests that a syntactic approach faces ‘just a few exceptions’. There is clearly some mainstream work, which highlights the role of non-syntactic factors in Island phenomena, e.g. Boeckx (2012), but C&P present considerable evidence that a syntactic approach is still widely assumed. In contrast, as we will see, C&P argue that other factors play a dominant role. Building on earlier work such as Deane (1991) and Kluender (1992, 1998), they argue that most island phenomena are not the product of syntactic constraints and explore alternative explanations.⁹

4. THE UNDERLYING GENERAL APPROACH

It is not hard to see that the problems just discussed stem in part from assumptions that have been very prominent in the study of syntax for many decades. One is the idea that there is no need when developing syntactic analyses to consider how they might fit into theories of language use. Another is the idea that acceptability is generally an unproblematic guide to grammaticality so that if a class of examples are unacceptable, it is generally reasonable to regard them as ungrammatical. Both ideas have been challenged, but they have been important features of most work on UD_s and have a lot to do with its character.

Chomsky (1965) highlighted the distinction between linguistic knowledge and language use when he introduced the terms competence and performance. He identified the former as the main object of linguistic research, but commented that ‘a reasonable model of language use will incorporate, as a basic component, the generative grammar that expresses the speaker-hearer’s knowledge of the language’ (Chomsky 1965: 11). This point seems to have had more influence outside the Chomskyan mainstream than within it. Thus, Bresnan (1978) argued against the 1970s version of transformational grammar and in favour of a precursor to Lexical Functional Grammar on the grounds that the latter fits more easily into a model of language use than the former. In similar vein, Gazdar (1981: 155) argued for Generalized Phrase Structure Grammar on the grounds that it provides ‘the beginnings of an explanation for the obvious, but largely ignored, fact that humans process the utterances they hear very rapidly’. As Hans van de Koot has reminded me, this claim was challenged, notably by Barton, Berwick & Ristad 1987, but the important point is that it took an outsider to highlight the issue. More recently, Sag & Wasow (2011) argue for HPSG and against Minimalism on the basis of

[9] Arguments for this position are also set out in Chapter 7 of Levine’s (2017) textbook.

compatibility with models of linguistic performance. Naturally, there have been attempts to incorporate Minimalism into models of performance. but, as noted in Section 6, C&P show that they have been problematic in various ways.

All this is very relevant to the issue of movement. Movement does not seem to fit into either a model of production or a model of comprehension. On a movement analysis of (14), *who* originates as the object of *about* and is moved to its superficial position.

(14) Who is Kim talking about ___?

Neither hearers nor speakers do this. Hearers begin with the sentence they hear and among other things look for a gap with which the filler *who* can be associated. Speakers begin with *who*, and may be unsure momentarily how they are going to proceed, but normally follow with a sentence with an associated gap. This means that it is quite unclear what role movement could play in models of language use, and, as discussed in Section 6, major implementations of Minimalism do not assume movement. It seems unlikely that movement analyses would still be assumed decades after alternatives were first proposed if the need to incorporate a model of linguistic knowledge into models of language use had been at the centre of syntactic research.

The distinction between grammaticality and acceptability was also clearly spelled out by Chomsky (1965), who emphasized that sentences could be more or less unacceptable but grammatical, and explored some of the factors that can lead to grammatical sentences being unacceptable. There have always been researchers concerned with this matter, but it has had rather less impact than might have been expected. Over the decades, many syntacticians have been quick to assume that unacceptable examples are ungrammatical. Quite often, if a few examples of some kind sound odd, it has been assumed that all examples of that kind are ungrammatical. This seems to have changed somewhat over the last decade or so with the relation between acceptability and grammaticality a central concern in works such as Sprouse Schütze & Almeida (2013). But for long it received little attention within mainstream work. This is surely a major reason why the idea that island phenomena are mainly a product of syntactic constraints has been so widely assumed for so long.

There is a further feature of much work, at least in mainstream syntax, which is of some importance here. As a number of commentators have noted, there has been a tendency to focus on a narrow range of data. Culicover & Jackendoff (2005: 535) remark that ‘much of the fine detail of traditional constructions has ceased to garner attention’. In similar vein, Sag (2010: 487) sees ‘a loss of both precision and descriptive coverage in the practice of transformational-generative grammar’. At one time, this was justified by a distinction between core constructions, which were seen as important, and peripheral constructions, which were thought to be of little interest. This distinction seems to have fallen by the wayside, but its effects seem to remain. It is of course true that not all data are equally important, and it is rational to concentrate on important facts and to ignore ones of less importance. But this can easily become a matter of concentrating on facts that are relatively straightforward for favoured analytic ideas while ignoring ones that are more difficult. A lot of important data has been presented in what can be viewed as mainstream literature

and C&P draw on it extensively, but facts that have been noted in the literature have often not had the impact that they should have. To take a concrete example, Ross (1967: 242) cited the following as evidence that subjects are not always islands:

(15) Of which cars were the hoods ___ damaged by the explosion?

But it was generally assumed over the following decades that subjects are indeed islands, and examples like this were largely ignored until Chomsky (2008). If one focuses on a narrow range of examples, one is likely to miss the problems that various types of example pose for both movement analyses and syntactic views of island phenomena.

All these matters figure prominently in C&P's discussion, as will be seen in the following pages.

5. THE NATURE OF THE BOOK

C&P explore the issues highlighted above and others, notably acquisition, in seven main chapters and a brief conclusion. Their book might be compared with Ross's (1967) dissertation. Both works have island phenomena as a central focus. Ross was hugely influential, and C&P could be at least as influential. But there are important differences. Ross's approach is largely that described in the previous section (although he could not be said to have focused on a narrow range of data). In contrast, C&P see syntax as one component of a body of knowledge employed in language use and assume that syntactic analyses need to take this fully into account. They also recognise that acceptability is often not a good guide to grammaticality and take the view that careful experimentation may be necessary to establish the sources of acceptability judgements. They also seek to handle as broad a range of syntactic data as possible.

It is clear from the outset that this book is rather different from Ross's dissertation. Processing issues are highlighted on page 2 when it is noted that hearers of UD's may have difficulty determining the position of the gap, and Section 1.4 is devoted to real-time processing and advocates a hybrid top-down and bottom-up parsing model. The complex nature of acceptability, especially in the area of island phenomena, is also highlighted early on, as are various non-canonical UD's, especially multiple gap examples. The examples in (7) and (8) above come from the first chapter, as does the following, which has no less than five gaps:

(16) There's no engine [which Geoff can't disassemble ____, clean ____, and put ____ back together without disparaging ____ or complaining about ____]. (6)

These matters are explored throughout the book, and one chapter (Chapter 6) is devoted to the results of experimental work. All this is quite different from Ross, and from most work on UD's of the last 50 years. It is perhaps worth adding that none of this should be seen as a criticism of Ross. There was clearly no possibility in 1967 of producing the kind of work that C&P have produced now. Ross's dissertation was an extremely impressive piece of work. So is C&P's book.

This is a complex book dealing with many different issues. I concentrate here on the central themes of the book, passing over some interesting but less important matters. The book may be quite demanding for readers who do not have all the types of expertise that C&P draw on, for example readers who are familiar with syntactic theory but not with the methods of experimental psychology, or vice versa. It is clear, however, that C&P have worked quite hard to make the various components of the book reasonably accessible, and if it requires an effort from some readers, it will be worth it.

In the following sections, I will look more closely at what C&P have to say about the nature of UD_s, then I will consider the main themes of their discussion of islands, and finally I will look at their remarks about acquisition.

6. THE NATURE OF UNBOUNDED DEPENDENCIES

C&P survey the various kinds of UD_s in Chapter 2, and explore movement analyses in Chapter 4, and non-movement analyses in Chapter 5. As indicated above, they have two main types of argument against a movement approach to UD_s and in favour of a non-movement approach. On the one hand, a movement approach is less able than a non-movement approach to handle the full range of UD possibilities. On the other, a movement approach seems much less suitable for incorporation into an account of language use than a non-movement account.

As emphasized earlier, many UD_s are rather more challenging than the simple cases that get the most attention. Earlier work such as Levine & Sag (2003) and Borsley (2012) has argued that such non-canonical UD_s are problematic for a movement approach and straightforward for the non-movement approach, but C&P develop this point in much greater detail. They focus especially on multiple gap examples such as (7) and (8) above, repeated here as (17) and (18):

- (17) There was the Hungarian Revolution [which we praised ___ and mourned ___ but did nothing about ___]. (5)
- (18) What did Sam eat ___ and drink ___? (6)

These are rather different from each other. (17) is what C&P call a convergent dependency, where multiple gaps are linked to a single filler and are co-referential. (18) is what they call a cumulative dependency, where multiple gaps are linked to a single filler but are not co-referential. As noted earlier, the former have had quite a lot of attention going back to Ross (1967) and they were a central concern of Gazdar (1981). The latter have had a lot less attention. C&P make a number of points about this phenomenon. For example, they note that a cumulative interpretation can usually be forced with the aid of the adverb *respectively*, a topic previously discussed in Chaves (2012):¹⁰

[10] They also consider Slavic examples like the following from Russian, in which coordinated phrases have different grammatical functions:

- (19) [What book and what magazine] did John buy ___ and Bill read ___
(respectively)?

Clearly, there is a challenge here for theories of syntax.

There has been work within the Minimalist Program on convergent dependencies, and also some consideration of cumulative dependencies, but C&P argue that it is unsatisfactory.

They look, for example, at the Sideward Movement approach of Nunes (2001), in which the filler moves from one gap position to the other before eventually moving to its superficial position. They note that this has a problem with an example like the following from Goodall (1987: 75), where the two gaps are associated with different cases and hence cannot be said to be copies.¹¹

- (20) We went to see a movie which [the critics praised ___] but [___ was too violent for my taste].

They also note that cumulative UD's are problematic for this approach since the two gaps cannot be copies because they are not coindexed,

They also look at approaches involving multiple mothers, which they associate with Citko (2005) among others. They argue that examples in which one of the gaps is a conjunct such (21), are problematic:

- (21) *[Which of her books] did you find both [[a review of ___] and ___]?

They also argue that it excludes multiple UDCs, such as the following:

- (22) This is a man to whom liberty we would never grant ___ ___.

Cumulative UD's also seem problematic for this approach.

A more promising approach to cumulative UD's is the functional trace approach of Munn (1999). However, C&P note, following Gawron & Kehler (2003), that this has problems with examples involving conjoined VPs such as the following:

- (23) What did Bill eat ___ and drink ___?

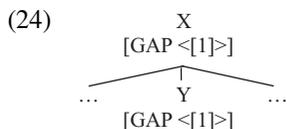
It seems, then, that multiple gap examples are a serious problem for movement approaches to UD's.

-
- (i) Kto i kogo peremig?
who_{NOM} and whom_{ACC} won
'Who took over whom?'

However, they suggest that such examples are probably the product of a special construction given their restricted nature.

[11] A referee remarks that (20) 'is ungrammatical for me, and in fact I think that judgement has been widely accepted in the literature since Williams (1978)'. A number of examples of this kind, many in published literature, are presented by C&P on pages 40–41. Thus, this looks rather like a case of assuming that all examples of some kind are ungrammatical because a few such examples sound odd.

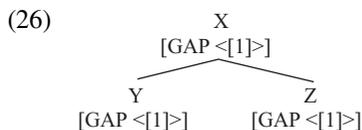
The alternative to movement which C&P advocate is an approach, originally proposed in Gazdar (1981) and developed in detail in HPSG, in which the syntactic and semantic properties of signs include information about the gaps they contain.¹² Except at the bottom of a UD this gap information reflects the gap information associated with one or more daughters. For C&P, this is encoded by a feature GAP, whose value is a list of signs.¹³ In simple cases, a sign and one of its daughters have the same value for GAP. Thus, we have trees of the following form, where any other daughters are [GAP <>] (<> being the empty list):



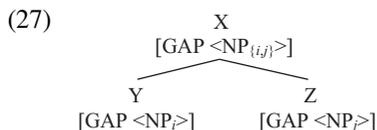
Consider, for example, (1) repeated here as (25):

(25) Kim we can always rely on ____.

Among other things, this includes a VP *rely on* with a PP daughter *on*, and both are [GAP <NP>] because both contain an NP gap. In a more complex situation, a sign and more than one of its daughters have the same value for GAP. If there are just two daughters, this means trees of this form:



Example (7)/(17) includes a structure of this form. The VP *praised and mourned* has two VP daughters *praised* and *and mourned*, and all three VPs are [GAP <NP>]. This, then, is the form that convergent dependencies take. It would be difficult to allow structures like (24) without also allowing structures like (26). Thus, convergent dependencies are expected within this framework. Finally, a sign may combine information from the GAP values of two (or more) different daughters, giving trees such as the following, where there are just two daughters:



[12] Other non-movement approaches have been developed within LFG and Categorical Grammar. C&P provide some critical discussion of the former on pages 17–18, and the latter on pages 16–17 and 224–226.

[13] In most HPSG work, the feature which encodes information about the gaps that signs contain is called SLASH, but what it is called is not important.

This is what is required for a cumulative dependency such as that in (8)/(18). This approach requires the constraints that capture the properties of various types of phrase to specify exactly how the GAP value of a phrase relates to the GAP values of its daughters. C&P show how this can be done on pages 178–180, using a precisely defined list-join relation. It is also necessary to provide analyses of the bottom of a dependency, where a gap or RP appears, and the top, which may or may not include a filler. C&P assume fairly standard HPSG ideas here. Thus, they have an approach which seems well able to handle the full range of UDs.¹⁴

C&P discuss the way movement is problematic for models of language use at some length. They consider a number of explicit attempts to reconcile Minimalism with the facts of incremental processing, notably Chesi (2007, 2015), Stabler (2013), and Hunter (forthcoming), and note that they end up with no movement and an approach to UDs that is reminiscent of that of Gazdar (1981).¹⁵ They conclude (155) that ‘[t]here is no evidence for MOVE operations in psycholinguistic or neurolinguistic research’ and that ‘all recent attempts to make the MP consistent with incremental sentence processing that we are aware of ... abandon MOVE altogether’. Unlike the movement approach, the approach developed by C&P is well suited to incorporation into models of language use. They emphasize that approaches like theirs ‘can be efficiently parsed, at scale, with basically the same algorithms that parse CFGs [Context-free Phrase Structure Grammars]’ (201). Thus, there seem to be two good reasons for preferring a non-movement approach to UDs to the traditional movement approach.¹⁶

7. THE NATURE OF ISLAND PHENOMENA

C&P focus on island phenomena in Chapters 3 and 5, and report on a series of experimental investigations in Chapter 6. They observe that

The major challenge that island phenomena pose to linguistic theory lies in precisely identifying whether a given phenomenon is due to syntax, semantics, pragmatics, processing, or some combination thereof. (51)

The dominant view has long been that island phenomena are largely a product of syntactic constraints. However, as noted earlier, various researchers have questioned this orthodoxy. Building on this work, C&P argue that most island phenomena are not a matter of syntax.

[14] C&P discuss RPs at some length, but do not provide an analysis. However, as they note, they are unproblematic for HPSG, in which, as noted earlier, there is no suggestion that UDs must be associated with a gap. See e.g. Borsley (2013) and Crismann (2016).

[15] They are also forced to abandon the idea that constructions are epiphenomenal, another basic tenet of Minimalism.

[16] I have concentrated in this section on facts that are problematic for any movement approach to UDs and not just the approach that is taken within Minimalism. It is worth noting, however, that C&P also have an interesting discussion of problems that are specific to the feature-driven movement analyses of Minimalism, e.g. the question of what triggers the intermediate movements in a typical UD.

In Chapter 3, C&P show that there are exceptions to most syntactic constraints that have been proposed. Examples noted in Section 3 show that the Coordinate Structure Constraint, the Subject Constraint, and the Adjunct Constraint are untenable. Here are some further examples ((30) is from Pollard & Sag 1994: 191):

- (28) Who did Sam [pick up the phone and call ___]? (75)
 (29) There are some things which [fighting against ___] is not worth the effort. (78)
 (30) Which room does Robin teach his class [in ___]? (87)

Much of C&P's discussion of the issues involves drawing attention to data that has largely gone unnoticed.

One response to these problems is to try to develop a modified syntactic approach, which does not incorrectly rule out the sorts of examples just highlighted. This response will be particularly attractive if one thinks that there are just a few exceptions. C&P consider a number of proposals of this kind and find them unsatisfactory, essentially because there are more than just a few exceptions.

They look, for example, at Chomsky's (2008) discussion of exceptions to the Subject Constraint. Chomsky develops an approach which predicts that extraction is possible from subjects which originate inside VP (because it can take place before the movement to subject position). A passive example like the following is unproblematic for this approach:

- (31) [Of which car] was [the driver ___] arrested]?

The examples in (12) and (29) above would also be unproblematic if their subjects could be analysed as originating inside VP. However, C&P point out that there are acceptable cases of extraction from a subject where such an analysis does not seem plausible, for example the following (141):¹⁷

- (32) (a) [Of which books] did [the authors ___] receive the prize?
 (b) [Which doctors] have [patients of ___] filed malpractice suits in the last year?
 (c) [Which President] would [the impeachment of ___] not cause much outrage?

They also point out that this approach allows certain examples which are unacceptable.

C&P also consider the account of exceptions to Adjunct Constraint developed in Truswell (2011), according to which violations are allowed when the main

[17] One referee raised questions about the acceptability of some of the examples in (32). However, Rui Chaves (personal communication) informs me that all of the examples in the book were reviewed by four native speakers of American English. Thus, these examples are clearly acceptable to some speakers.

predicate and the modifier characterize the same event. They note that there are a variety of acceptable cases of extraction from an adjunct which do not have this property, for example the following (87):

- (33) (a) [Which people] can Robin run [nearly as fast as ___]?
 (b) This is the watch that I got upset [when I lost ___].

(The example in (33a) comes from Hukari & Levine 1995, and (33b) is attributed by Truswell (2011: 175 n. 1) to personal communication from Ivan A. Sag.) It seems, then, that this is not a very promising approach.

C&P explore these issues at some length, and show that there is strong evidence against an approach to islands which is primarily syntactic. However, they suggest that there is one important syntactic constraint, namely that a gap must be an argument, or more precisely a member of the ARG-ST list of a head. One point to note straightaway is that adverbial gaps in examples like the following are unproblematic for this approach:

- (34) (a) [When] do you suspect Robin will be home ___?
 (b) [Where] did you say Mia found a fossil ___ last summer?
 (c) [Why] do you suppose Robin tried to do that ___?

Following Bouma, Malouf & Sag (2001), and other earlier work, C&P assume (33–36) that some adverbials are optional extra arguments. Hence such examples involve an argument gap and so are correctly allowed.

On the assumption that conjunctions are not heads with an ARG-ST list, this constraint accounts for the unacceptability of examples like (9) above, repeated here as (35).

- (35) *Who did you see Roger and ___ yesterday? (7)

C&P propose that this constraint is also responsible for the unacceptability of examples associated with the Left Branch Condition, such as (36).

- (36) *Whose did you meet ___ friend? (102)

It seems reasonable to assume that the gap in (36) is not an argument, but it is not obvious that this is true of the gaps in the following examples, where it looks rather like a subject argument:

- (37) (a) *Whose did you read ___ description of the accident?
 (b) *Whose do you remember ___ being late?

This may well be an area where further thought is necessary.¹⁸

[18] See Nikolaeva & Spencer (2019: Chapter 2.3) for an interesting recent discussion of the analysis of possessive constructions. There are, of course, languages which appear to allow LBC violations, notably Slavic languages. C&P suggest (102) that the extracted phrase in such examples is probably in apposition to the nominal head, but they do not develop this idea.

C&P argue that a variety of non-syntactic factors are involved in island phenomena and provide a list on pages 58–59, but they focus especially on relevance in Grice’s sense (or that of Relevance Theory). They argue that

the only constraint that is common to all UDCs boils down to a general Gricean Relevance presupposition: speakers can felicitously draw attention to a referent by using a non-canonical construction such as a UDC only if the referent is sufficiently relevant to the main action that the utterance describes, i.e. if the referent is taken to be the center of current interest relative to the proposition in which it occurs. (203)

This is particularly relevant to when subjects are and are not islands. Subjects tend to be islands because they are commonly topics and hence their constituents cannot be ‘the center of current interest relative to the proposition in which it occurs’. But where a subject is not required to be a topic, it is not an island. As Abeillé et al. (2020) emphasize, this is generally the case in relative clauses, hence the acceptability of (12) above, repeated here as (38):

(38) They have eight children of whom five ___ are still living at home. (77)

There are also cases where the subject of a *wh*-interrogative is not an island, as in the examples in (39):

(39) (a) [Which crime] will [the punishment for ___] never be carried out? (80)
 (b) [Which disease] will [the cure for ___] never be discovered?

Here, the extracted nominals are specific and cohere very well with the subject head nominal. Hence, they are unproblematic.

What is and is not relevant is also important for extraction from objects, where we have contrasts like the following (originally noted, as a referee has reminded me, by Bach & Horn 1976):

(40) (a) What did you read a book about? (207)
 (b) *What did you drop a book about?

As C&P note, these contrast ‘because the content of a book is relevant for understanding a book-reading scene, but not so much for understanding a book-dropping scene’ (207).

In Chapter 6, C&P turn to experimental evidence for their approach and report on five experiments into island phenomena, which build on earlier experimental work of Chaves and others. Three consider extraction from subjects, and two focus on adverbials. Their findings reinforce the conclusions reached in earlier discussion. Experiment 1 shows that extraction from subjects becomes more acceptable as a result of exposure, unlike clearly ungrammatical structures, and experiment 2 shows that the same is true of extraction from clausal subjects. Experiment 3 shows that the more important the extracted referent is for the proposition described by the

utterance, the more acceptable extraction from a subject is. Experiment 4 shows that extractions from phrasal adverbials range from highly acceptable to highly unacceptable, and can improve dramatically with repeated exposure. Finally, experiment 5 suggests that a syntactic explanation is unlikely for the acceptability of extraction from tensed adverbial clauses. This chapter is an important feature of the book, distinguishing it from most work on UDs. It will not be surprising if much future work on UDs has a similar experimental component.

8. ACQUISITION

C&P might have addressed the main concerns of their book without considering acquisition, but whatever view of grammatical knowledge one subscribes to, it is natural to ask how it is acquired, and this is what C&P do in Chapter 7. Almost all theoretically informed research on the acquisition of syntax has taken mainstream Chomskyan syntax as its main point of reference.¹⁹ This makes C&P's discussion quite important.

Building on the discussion in Chapter 5, C&P propose that a speaker's grammar is not a redundancy-free system of constructions of the kind that is standardly assumed within HPSG, but a system of chunks of grammatical structure of varying complexity and associated with specific frequencies. This conception can explain the fact that speakers process some structures more quickly than others which have the same status within a redundancy-free grammar and the fact that how quickly they process some structures may change over time. Crucially, in the present context, it allows grammatical knowledge to be gradually acquired from experience without need for any specifically linguistic innate assistance.

Particularly interesting is the discussion of polar interrogatives. C&P set out a formal account of their development (248–249). They also challenge the long-standing contention that they provide evidence for innate linguistic knowledge. It has been widely argued since the 1970s that only some form of innate knowledge could explain the fact that speakers produce sentences like (41a) and not non-sentences like (41b):

- (41) (a) Is the man who is here tall?
 (b) *Is the man who here is tall?

Within the general approach assumed by C&P, '[a]ll the child must learn, as far as syntax is concerned, is that a sentence-initial auxiliary is followed by its subject and its complement' (246). Simple examples provide ample evidence for this. Examples like (41a) will be correctly produced once the learner has also mastered relative clauses.²⁰ There will be no possibility of something like (41b) being

[19] An interesting earlier HPSG-based discussion of acquisition, which C&P draw on, is Green (2011).

[20] There has been some discussion in the literature (e.g. Pullum & Scholz 2002: 36–46) about whether learners encounter examples like (41a). But this is really not important. As long as

produced because it does not involve an auxiliary followed by its subject and its complement. *The man who here* is not a possible subject because it is not a well-formed NP, and *is tall* is not a possible complement of *is* because *is* does not allow a finite VP as its complement. A referee comments on this argument that ‘[i]t is far from obvious what “complement” means here and how the child can acquire this notion’. But ‘complement’ has just the same sense here as elsewhere, essentially a non-subject syntactic argument, and there are no special acquisition problems. If the notion is unproblematic in declaratives, it is unproblematic here. Thus, C&P’s discussion of this matter suggests that the idea that there is an argument in this area for some innate linguistic knowledge should finally be put to rest.²¹

A number of other issues are discussed in this chapter, but it is quite short – just 16 pages. It seems to me, however, that the general approach outlined here is very promising. It is to be hoped that C&P or others will build on this approach. There is a great deal of work that could be done.

9. FINAL REMARKS

In the preceding pages I have sought to spell out the central themes of C&P’s book. However, there is much else that is of interest here. For example, they have an interesting discussion (97–100) of what they call the Complementizer Constraint, the unacceptability of a subject gap following a complementizer, exemplified by (42):

(42) *What do you think that ___ broke the window? (97)

Building on the ideas of Kandybowicz (2006, 2009), they tentatively propose that this is due to conflicting prosodic phrasing requirements (100). Also of considerable interest is the discussion (108–110) of the relation of islands to ellipsis, which, they argue, provides evidence that ‘ellipsis resolution is a context-dependent anaphoric mechanism that does not require complex structure at the ellipsis site’ (108). Especially interesting in my view is the discussion of the relation of islands to the scope of quantifiers and in-situ interrogative words (110–119). C&P argue that the facts provide no evidence for covert movement, or, more theory neutrally, that there is no evidence that these phenomena involve the same mechanism as standard UDs.

learners have mastered both polar interrogatives and relative clauses, such examples will be unproblematic even if they have not encountered examples like (41a). In much the same way, if learners have mastered both preposition + object structures and relative clauses, they will have no difficulty with preposition + object structures where the object contains a relative clause, whether or not they have encountered them.

[21] In support of the contention that there is no acquisition problem here, C&P note that ‘a range of computational modeling results suggest that SAI [i.e. polar interrogatives] can be learned by CFGs from the data alone’, citing among others Lewis & Elman (2001) and Bod (2009).

Of course, none of this implies that there are no proposals here that can be questioned. I noted in [Section 7](#) above that it is not obvious that the restriction that a gap must be an argument can account for the Left Branch Condition. It may not even account for the fact that a gap cannot be a conjunct. It is probably quite widely assumed within HPSG that conjunctions are markers combining with a sister which is not an argument. However, it has also been proposed, e.g. in Abeillé (2003), that conjunctions are weak heads, heads which derive most of their properties from their complement, so that a conjunction with a nominal complement has nominal properties, a conjunction with a verbal complement has verbal properties, and so on. On standard HPSG assumptions, the complement is an argument. Hence on this analysis, some other account is necessary for the fact that a gap cannot be conjunct.²²

It may be that there are no problems here. But it would be very surprising in a book of such breadth if there were not some proposals that ultimately turn out to be untenable. However, many of the detailed proposals are not that important. It is the central themes of the book that really matter, especially the critique of the movement approach to UD's and the syntactic approach to island phenomena, and the argument for an approach to syntax which takes full account of the fact that it is one component of a body of knowledge employed in language use and recognises that acceptability is often not a simple reflection of grammaticality. These all seem sound.

There are also some unresolved issues here. For example, C&P say the following about *wh*-islands:

Much more research is needed in order to pinpoint the combination of factors that give rise to English Wh-island effects and Superiority, but what seems clear is that purely syntactic accounts are unlikely to explain the full range of facts, given their gradience, sensitivity to context, and correlation with established models of sentence-processing difficulty. (97)

I also noted earlier that there is a great deal of work that could be done on acquisition, building on the approach outlined in Chapter 6. Again, this is not surprising in a book like this. C&P argue at length for a number of positions, but they are also setting out a research programme, and a research programme is essentially a collection of unresolved questions together with a strategy for resolving them.

The fact that C&P are both arguing for certain positions and setting out a research programme makes this a work of considerable importance. Again, it can be

[22] As Bob Levine has pointed out to me, the following suggests that it may sometimes be possible for a gap to be a conjunct:

(i) Succeed he must ___ or be forever shamed.

It may be, however, that this is a case of clausal coordination where the second clause is elliptical.

compared with Ross (1967), which obviously led to a great deal of research on island phenomena. This could do the same, but it will be research of a rather different kind with the relation between competence and performance and the complexity of acceptability judgements as central concerns. If the book has the impact that it deserves, syntactic research will come to look rather different. Put simply, there will be more work aiming to develop analyses that can be incorporated into models of language use and more work utilizing appropriate experiments to disentangle the sources of speakers' judgements. It will be an important and very welcome change, perhaps even paradigm shift.

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Author's address: School of Languages, Literatures and Linguistics, Bangor University,
Bangor, Gwynedd LL57 2DG, UK
rborsley@essex.ac.uk