

# Displacement in Syntax

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Displacement is a ubiquitous phenomenon in natural languages. Grammarians often speak of displacement in cases where the rules for the canonical word order of a language lead to the expectation of finding a word or phrase in a particular position in the sentence but it surfaces instead in a different position and the canonical position remains empty: ‘Which book did you buy?’ is an example of displacement because the noun phrase ‘which book’, which acts as the grammatical object in the question, does not occur in the canonical object position, which is after the verb in English. Instead, it surfaces at the beginning of the sentence and the object position remains empty. Displacement is often used as a diagnostic for constituent structure because it affects only (but not all) constituents. In the clear cases, displaced constituents show properties associated with two distinct linear and hierarchical positions. Typically, one of these two positions *c*-commands the other and the displaced element is pronounced in the *c*-commanding position. Displacement also shows strong interactions with the path between the empty canonical position and the position where the element is pronounced: one often encounters morphological changes along this path, evidence for structural placement of the displaced constituent, as well as constraints on displacement induced by the path.

The exact scope of displacement as an analytically unified phenomenon varies from theory to theory. If more than one type of syntactic displacement is recognized, the question of the interaction between movement types arises. Displacement phenomena are extensively studied by syntacticians. Their enduring interest derives from the fact that the complex interactions between displacement and other aspects of syntax offer a powerful probe into the inner workings and architecture of the human syntactic faculty.

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# 1 Displacement: The phenomenon

Displacement is a ubiquitous phenomenon in natural languages. Grammarians often speak of displacement in cases where the rules for the canonical or unmarked word order of a language (see Dryer, 2007 for common ways of diagnosing unmarked word order) lead to the expectation of finding a word or phrase in a particular position in the sentence but it surfaces instead in a different position and the canonical position remains empty. To take a concrete example, the canonical order for English sentences is subject-auxiliary-verb-object, (1a). Under the characterization of displacement just given, all of the examples in (1b)–(1d) involve displacement of the object and (1e) involves displacement of the auxiliary. The underscore in the examples marks the canonical position of the displaced element. A theory neutral way of referring to the displaced constituent is as the filler and the canonical position as the gap.

- (1) a. (I know that) John will drink absinth.  
  subject auxiliary verb object
- b. I know what John will drink \_\_\_\_  
  object subject auxiliary verb
- c. Absinth, John will drink \_\_\_\_ (, but not beer).  
                        object subject auxiliary verb
- d. the beverage which John will drink \_\_\_\_  
  object subject auxiliary verb
- e. Will John \_\_\_\_ drink absinth?  
                        auxiliary subject verb object

In section 4 we will see that this rough and ready characterization of displacement in terms of canonical/non-canonical word order alternations only works as a first approximation, the determination of the scope of the phenomenon of displacement in syntax being ultimately made by the syntactic theory. In many theories certain word order alternations are explained without displacement while at the same time displacement might be invoked for cases of non-alternating word order.

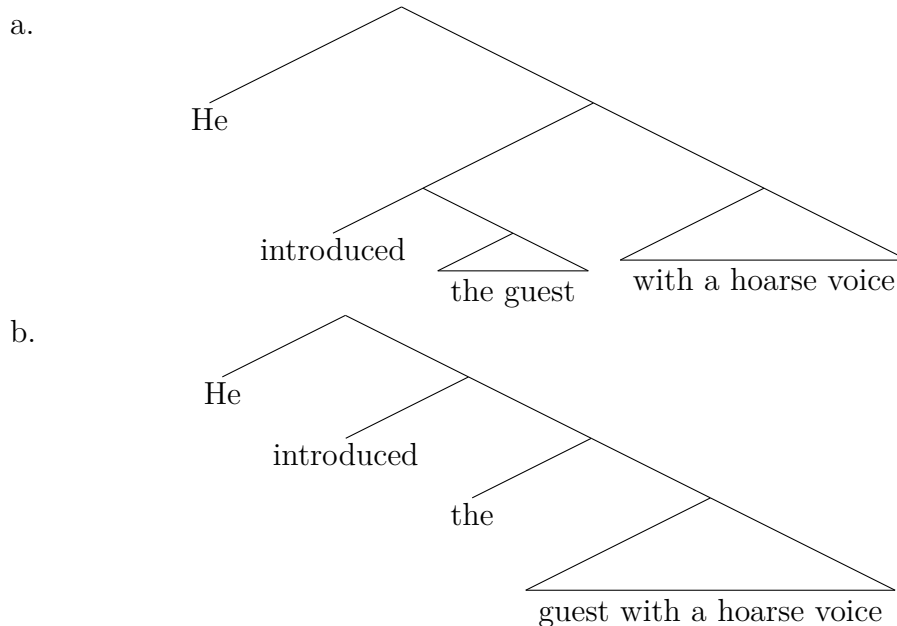
In much of the rest of the article, except for section 4, we will focus on the properties of the displacement of interrogative pronouns and interrogative phrases (wh-phrases) mostly in English. One characteristic property of wh-displacement is that it can be unbounded, i.e., there is no grammatically determined upper limit to the linear and structural distance between filler and gap, (2). In (2a) the linear distance between filler and gap is seven words, in (2b) it is ten words, in (2c) — 12, and in (2d) — 15. The structural distance between filler and gap, as measured by how deeply embedded the gap is compared to the filler is one clause in (2a), two in (2b), three in (2c), and zero in (2d). In the latter, filler and gap are both

in the main clause. Clausal constituents in (2) are delimited by square brackets.

- (2) a. What did Mary claim [ John tried to devour \_\_\_\_ ]?  
 b. What has Bill heard [ that Mary claimed [ John tried to devour \_\_\_\_ ] ]?  
 c. What do you think [ Bill heard [ that Mary claimed [ John tried to devour \_\_\_\_ ] ] ]?  
 d. Who does the allegation [ that Mary sold state secrets to the Russians for personal gain ] annoy \_\_\_\_?

Syntactic displacement is structure dependent in several ways. Firstly, only constituents can be displaced. To see this note that example (3) is structurally ambiguous. The two readings can be paraphrased as follows: ‘He introduced the guest and he did it with a hoarse voice.’ and ‘He introduced the guest who had a hoarse voice.’ Their structures are given in (3a) and (3b), respectively.

- (3) He introduced the guest with a hoarse voice.



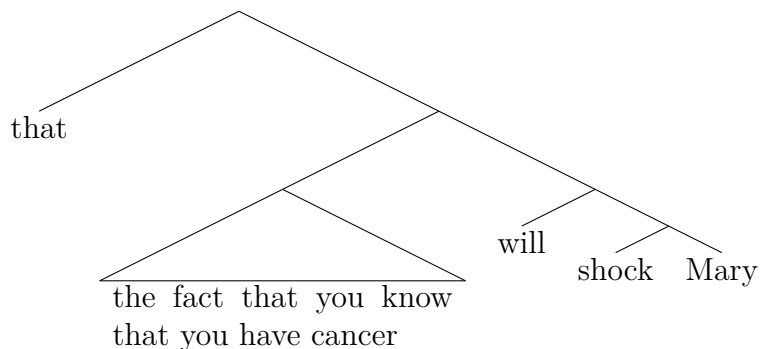
As can be seen in (4a)–(4b), displacement leads to a loss of the ambiguity. Example (4a) must be based on (3a), since the displaced string of words ‘the guest’ is a constituent only in (3a); thus, (4a) only has the reading corresponding to (3a). Likewise for (4b). (4b) must be based on (3b), since the displaced string of words ‘the guest with a hoarse voice’ is a constituent only in (3b); thus, (4b) has only the reading corresponding to (3b). Example (4c) is ungrammatical: the displaced string of words doesn’t correspond to a constituent in any of the structures.

- (4) a. The guest, he introduced \_\_\_\_\_ with a hoarse voice (not the host).  
 b. The guest with a hoarse voice, he introduced \_\_\_\_\_ (not the guest with a shaved head).  
 c. \*The Guest with he introduced \_\_\_\_\_ hoarse voice.

A second way in which displacement is structure dependent concerns the observation that the displaced element always c-commands the gap. (This generalization is called the Proper Binding Condition and it goes back to Fiengo 1977.) C-command is a relation defined hierarchically on syntactic trees (for discussion of the family of syntactic command relations, of which c-command as defined here is the simplest because it makes no reference to category labels on nodes, see Barker and Pullum 1990): A node  $\alpha$  c-commands another node  $\beta$  iff  $\beta$  is or is dominated by a sister of  $\alpha$ . Consider the embedded clauses in (5). (5a) is a clause introduced by the complementizer ‘that’, followed by a very complex subject (‘the fact...cancer’), the auxiliary ‘will’, the verb ‘shock’, and the object ‘Emily’. The structure is sketched in (5b). In (5c), the object has been displaced to a c-commanding position in front of the subject with accompanying loss of the complementizer ‘that’. A rough structure for (5c) is given in (5d). Notice that the displaced element is pronounced in the c-commanding (high) position.

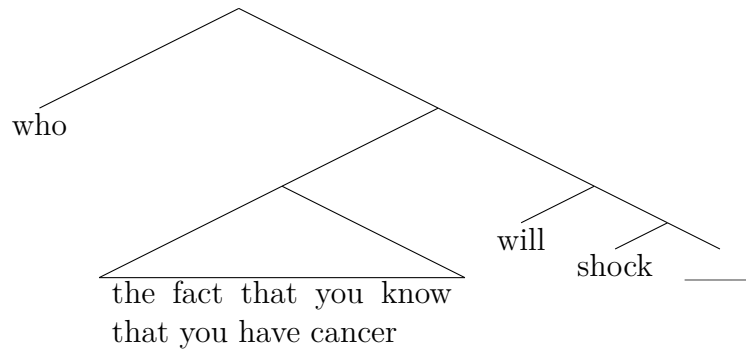
- (5) I know  
 a. ... that the fact that you know that you have cancer will shock Emily.

b.



- c. ...who the fact that you know that you have cancer will shock \_\_\_\_\_.

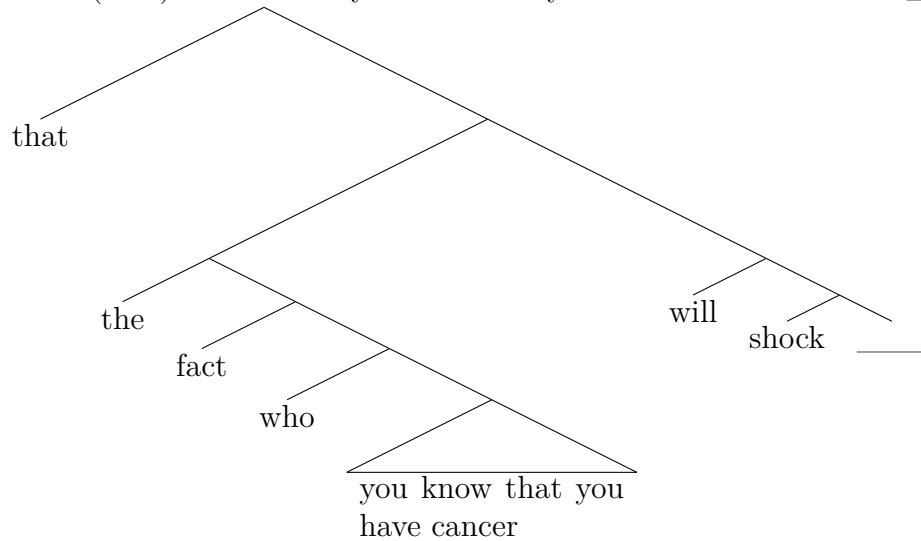
d.



The sister of ‘who’ in (5d) is the constituent that makes up the entire rest of the clause. It contains the gap, as required.

It is clear from the examples that the verb ‘know’ can combine with declarative clauses, (5a), and with indirect questions, (5c). It might therefore be expected that example (6a) is well-formed. As shown in (6b), ‘who’ (the object of ‘shock’) is displaced to the position between ‘know’ and ‘you’. The structural sister of ‘who’ is the constituent ‘you know that you have cancer’. Obviously, ‘who’ in its displaced position does not c-command the gap; the example violates the generalization that displaced elements must c-command the gap and is, therefore, complete gibberish.

- (6) a. \*I know (that) the fact that you know who you have cancer will shock \_\_\_\_  
 b.



A third demonstration of the structure dependence of displacement comes from constraints on displacement and the interaction between properties of the structural path between filler and gap and the wellformedness of displacement. Such effects will be discussed in 3.2.

Section 2 and 3 discuss the displacement of wh-phrases, mostly in English. Section 2.1 shows that for certain phenomena displaced wh-phrases have the char-

acteristic behavior of phrases occupying the gap (low behavior) and section 2.2 shows that for other phenomena they show characteristic properties of occupying the structurally higher, *c*-commanding position of the filler (high behavior). Section 3 introduces the notion of a structural displacement path, section 3.1, and discusses interactions between displacement and the path, section 3.2. Section 4 returns to the question of how to delimit the role of displacement in syntax without, however, attempting to answer the question.

## 2 Low and high behavior of displaced constituents

This section briefly introduces evidence to the effect that a displaced constituent can have properties associated with the apparent hierarchical position of the gap (subsection 2.1) and with the hierarchical position of the filler (subsection 2.2).

Sentence structure is characterized in terms of the linear order, hierarchical arrangement, and the category of elements making up the sentence. In the next subsection we will see evidence that a displaced constituent must be associated in some way with the site of the gap despite their different linear position. This might suggest that displacement is a purely linear phenomenon, that is, it raises the possibility that the displaced constituent occupies the position of the gap but is linearized discontinuously with its structural sister. Above, we already illustrated the important generalization that fillers always *c*-command gaps. This fact alone already demonstrates that displacement cannot be given a full characterization in terms of linear order of words alone but must take constituent structure into account. However, even a characterization of displacement as anomalous linearization mindful of syntactic structure is insufficient and standard theories of displacement associate the displaced constituent with (at least) two distinct hierarchical positions: the position occupied by the filler and that of the gap, as in structure (5d) above. Mindful of how syntactic structures are usually depicted, we can then characterize behavior characteristic of the gap site as ‘low’ behavior and behavior characteristic of the filler site as ‘high’ behavior.

### 2.1 Low behavior of displaced constituents

Consider example (7). The interpretation of ‘this song’ with respect to the event described by the embedded clause varies systematically with the verb. ‘This song’ is the object created, hated, or banned. These interpretations characterize very specifically the object of the subordinate clauses, as its subject ‘Sally’ receives a different set of interpretations.

(7) John knows Sally {wrote | hated | banned} this song.

In example (8), ‘this song’ has been replaced by ‘which song’ and displaced to the front of the embedded clause. ‘Which song’ receives exactly the same characteristic interpretations (of object created, hated, and banned, respectively) as the in situ objects in (7). The displaced phrase inherits the semantic (thematic) interpretation of the gap site.

(8) John knows which song Sally {wrote | hated | banned}\_\_\_\_\_.

We will now see that the displaced phrase also has important syntactic properties of the gap site. First, consider selection. Example (9a)–(9c) that ‘applaud’, ‘admire’, and ‘sleep’ respectively select an object optionally, obligatorily, and not at all. None of them select two objects, (9d).

- (9) a. Mary applauded (the performance).  
 b. Mary admired \*(the performance).  
 c. Mary slept (\*the performance).  
 d. \*Mary {applauded | admired | slept} the performance the artist.

Example (10) shows that the displaced wh-phrase plays the role of the optional, obligatory, or prohibited object. In other words, the displaced constituent fulfills the selectional properties associated with the gap.

- (10) a. (Which performance) did Mary applaud \_\_\_\_\_?  
 b. \*(Which performance) did Mary admire \_\_\_\_\_?  
 c. (\*Which performance) did Mary sleep \_\_\_\_\_?  
 d. \*Which performance did Mary {applaud | admire | sleep} \_\_\_\_\_ the artist?

In terms of agreement, displaced wh-phrases also behave as though they were in situ. In English, the verb shows (some) morphological agreement with the local subject. Thus, (11a) requires ‘is’ and (11b) requires ‘are’ in the embedded clause. Notice that the presence of a singular subject ‘Fred’ in the main clause does not influence agreement in the embedded clause.

- (11) a. Fred thinks this player {is | \*are} the fastest.  
 b. Fred thinks these players {\*is | are} the fastest.

Displaced wh-phrases trigger agreement just as if they occupied the position of the gap. This is illustrated in (12), where the displaced wh-phrase ‘which player(s)’ relates to the gap in the subject position of the embedded clause.

- (12) a. Which player does Fred think \_\_\_\_\_ {is | \*are} the fastest?  
 b. Which players does Fred think \_\_\_\_\_ {\*is | are} the fastest?

We see the characteristic agreement effect as though the *wh*-phrase were in situ.

A further illustration of the low behavior of a displaced *wh*-phrase comes from languages with case morphology on fillers. In such languages the form of the filler varies in the same way with the verb as an element filling the gap would; (13) shows that the German verb ‘*unterstützen*’–*support* takes an accusative object while ‘*helfen*’–*help* takes a dative object. Questions about those being supported or helped must be introduced by interrogative pronouns in the appropriate form: accusative for ‘*unterstützen*’–*support* and dative for ‘*helfen*’–*help*, (14).

- (13) a. Der Junge will {einen | \*einem} Mann unterstützen.  
 the.NOM boy wants a.ACC a.DAT man support  
 ‘The boy wants to support a man.’  
 b. Der Junge will {\*einen | einem} Mann helfen.  
 the.NOM boy wants a.ACC a.DAT man help  
 ‘The boy wants to help a man.’
- (14) a. {Wen | \*Wem} will der Junge \_\_\_\_ unterstützen?  
 who.ACC who.DAT wants the.NOM boy support  
 ‘Who does the boy want to support?’  
 b. {\*Wen | Wem} will der Junge \_\_\_\_ helfen?  
 who.ACC who.DAT wants the.NOM boy help  
 ‘Who does the boy want to help?’

As a final illustration that displaced constituents behave as though they occupied the gap position comes from their interpretation, specifically, the interpretation of pronouns within the displaced phrase. Pronouns have various uses. In the use relevant to the present discussion, a pronoun does not pick out a particular, stable referent, but instead depends for its reference on another expression and the referent varies with that other expression.

Example (15) illustrates this. The possessive pronoun ‘his’ has three easily accessible interpretations: First, ‘his’ can refer back to Joe (...no boy has found Joe’s mother). Second, ‘his’ can pick out a referent not mentioned in the in the sentence at all; for example, if we have been talking about a boy named Fred, then ‘his’ can refer back to Fred (...no boy has found Fred’s mother). Finally and most importantly, ‘his’ can depend on ‘no boy’ (...no boy has found his own mother).

- (15) Did Joe say the headmistress thinks that no boy has found his mother?

Now compare this to example (16)

- (16) Did Joe say his mother thinks that no boy has found the headmistress. ?

This example allows the first two interpretations but the interpretation where



‘his’ depends for its reference on ‘no boy’ is not available (or only at a stretch).

Examples (15)–(16) illustrated the behavior of a pronoun within a phrase that has not been displaced. Now consider examples (17) and (18). The examples are constructed on the basis of (15)–(16) by replacing ‘his mother’ by ‘which of his relatives’ and displacing the *wh*-phrase to the beginning of the clause. The *wh*-phrase appears in exactly the same sentence initial position in both of the examples. We are interested in the question of whether the possessive pronoun within the displaced phrase in examples (17) and (18) has the referentially dependent reading.

- (17) Which of his relatives did Joe say the headmistress thinks that no boy has found \_\_\_\_?
- (18) Which of his relatives did Joe say \_\_\_\_ thinks that no boy has found the headmistress?

As can be seen, the referentially dependent reading is available in example (17) but not (or only at a stretch) in example (18). Thus, the interpretation of the possessive pronoun is not determined by the position where the phrase is pronounced, which is the same position in both examples. Instead, the interpretation is determined by the position of the gap: The possessive pronoun in (17) has the same interpretive range as (15) and the possessive pronoun in (18) has the same interpretive range as (16). This is what we have been calling the low behavior of the displaced phrase.

In this subsection we have seen five ways in which a displaced constituent behaves as though it were *in situ*, that is, as though it occupied the position of the gap. This kind of evidence is strong motivation for structurally associating the displaced constituent with the position of the gap. It should be noted that not all types of displacement behave identically. While all kinds of displacement show low behavior for selection, some displacement operations show low and others high behavior when it comes to case and pronominal interpretation, see section 4.

## 2.2 High behavior of displaced constituents

The previous subsection looked at the low behavior of constituents displaced by *wh*-movement. We now turn to their high behavior.

As mentioned in the introduction, the Proper Binding Condition demands that dislocation target a *c*-commanding position. This leads to the straightforward prediction that we should be able to find processes that apply to constituents including the gap but excluding the filler. Such a prediction cannot be derived from a hypothetical theory (though see Blevins, 1990; Kathol, 2000) that explained the low behavior of displacement in terms of a low hierarchical position of the filler and its linear position in terms of discontinuous constituency: such a theory crucially would not make available any constituents including the gap but excluding the

filler. Prima facie evidence that the theory associating displaced constituents with two hierarchical position is correct comes from sluicing and other types of ellipsis. In sluicing, the meaning of a wh-question is expressed by a truncated expression consisting of just a wh-phrase. Example (19) is possible both with the material in angled brackets pronounced and with this material left out. When the material is left out, we are apparently dealing with ellipsis of a clausal constituent containing the gap but excluding the filler.<sup>1</sup>

(19) Fred liked some report. Guess which report <Fred liked \_\_\_\_ >!

The example shows that the expectations of a theory associating displaced constituents with a high hierarchical positions are borne out.<sup>2</sup>

Another piece of evidence for the assumption that displaced constituents occupy a position hierarchically higher than the gap comes from anti-reconstruction effects. The previous subsection introduced a number of reconstruction effects, that is, effects where where a displaced constituent behaves as though it occupied the position of the gap. There are also instances where this is not the case: anti-reconstruction effects.

Consider the examples in (20a) and (20b). In (20a) ‘him’ can refer to the same person as ‘Fred’, but in (20b) ‘he’ cannot refer to the same person; ‘he’ and ‘Fred’ must be different people.

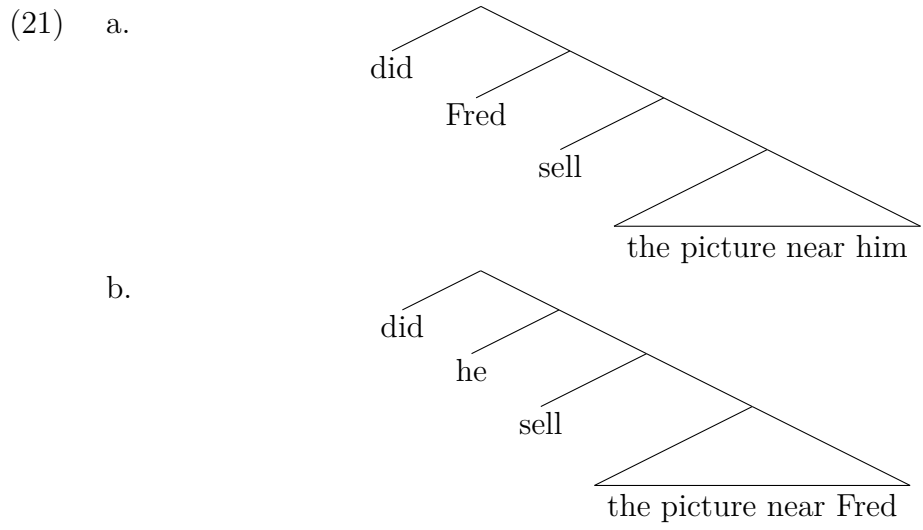
- (20) a. Did Fred sell the picture near him?  
b. Did he sell the picture near Fred?

The principle behind this observation is, as a first approximation, that an expression which can refer to an individual (like ‘Fred’) must not be c-commanded by a pronoun referring to the same person. As structure (21a) shows, ‘Fred’ in (20a) is not c-commanded by the pronoun and the two can refer to the same person. However, as structure (21b) shows, ‘Fred’ is c-commanded by ‘he’ in (20b) and co-reference is impossible. (Note that an alternative purely linear formulation of the principle, whereby a referential expression cannot come after a pronoun picking out the same referent, would work for examples (20a)–(20b) but would fail for (22a), immediately below.)

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<sup>1</sup>Ellipsis is but one constituency diagnostic that can be brought to bear on this question. Displacement of constituents containing a gap but not the corresponding filler, so-called remnant movement, provides converging evidence. The interested reader is referred to Müller 1998.

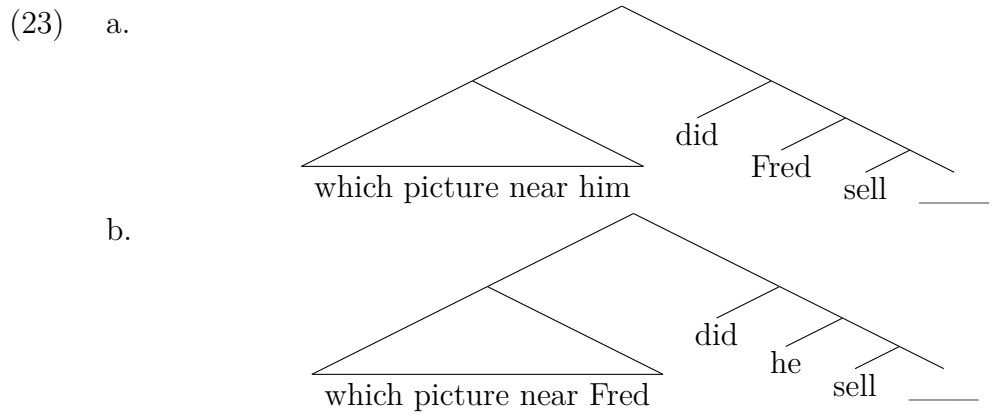
<sup>2</sup>It should be noted that the argument is not entirely uncontroversial, since the involvement of unpronounced syntactic structure in ellipsis has sometimes been disputed. As has the claim that ellipsis targets complete constituents. See Abe 2015; Abels to appear; P. W. Culicover and Jackendoff 2005 for relevant discussion.



The crucial observation is that when the object is displaced, the difference between the examples disappears. ‘Fred’ and ‘him’/‘he’ can refer to the same person both in (22a) and in (22b). Example (22a) is based on (20a) with ‘the’ replaced by ‘which’ and the entire object displaced to the beginning. Examples (22b) and (20b) are related in just the same way.

- (22) a. Which picture near him did Fred sell \_\_\_\_?  
 b. Which picture near Fred did he sell \_\_\_\_?

We can understand why the examples allow the interpretations they do, by inspecting their structures, (23). In (23a) ‘him’ does not c-command ‘Fred’ and therefore the two can refer to the same person. In (23b), ‘he’ does not c-command ‘Fred’ and therefore the two can refer to the same person.



To achieve this result, we have to apply the principle that blocks coreferential interpretation in (20b) (with the structure in (21b)) to the wh-phrase in the

displaced position in (22b) (with the structure in (23b)). In other words, the displaced constituent shows high behavior.<sup>3</sup>

A final illustration that displaced constituents behave unlike their non-displaced counterparts comes from the phenomenon of parasitic gaps (see P. W. Culicover and Postal, 2001; Engdahl, 1983). A basic example (Engdahl 1983, ex. 1) is given in (24).

(24) Which articles did John file \_\_\_\_\_ without reading \_\_\_\_\_.

There are two gaps in this sentence: one after ‘file’ and another after ‘reading’. The content of both gaps depends on the displaced constituent. The gap after ‘reading’ is parasitic on the regular gap after ‘file’ in the sense that the parasitic gap cannot exist without the regular gap, as (25b) shows. The regular gap on the other hand can exist without the parasitic gap, (25a).

(25) a. Which articles did John file \_\_\_\_\_ without reading Fred’s report?  
b. \*Which articles did John file Fred’s report without reading \_\_\_\_\_?

A second important property of parasitic gaps is that they are possible only when there is displacement. Example (26) has the same wh-phrase (‘which articles’) functioning as the object of the verb as in example (24). But while it is displaced in (24) and does license the parasitic gap, it is not displaced in (26) and does not license the parasitic gap.

(26) Who filed which articles without reading {\*\_\_\_\_\_\_ | them}?

This shows again that in-situ and displaced phrases have different syntactic properties. Crucially, the high position of the wh-phrase determines possible the structural positions for the parasitic gap, since the wh-phrase in the high position must c-command the parasitic gap. To see this, consider the following sentences.

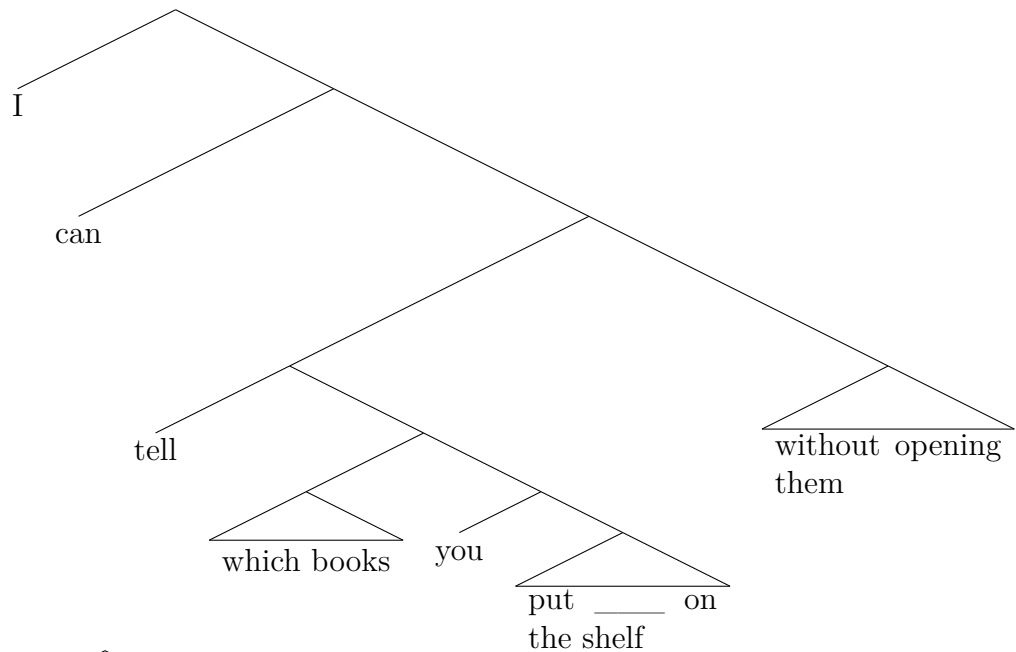
(27) a. I can tell which books you shelved \_\_\_\_\_ without opening them.  
b. I can tell which books you shelved \_\_\_\_\_ without opening \_\_\_\_\_.

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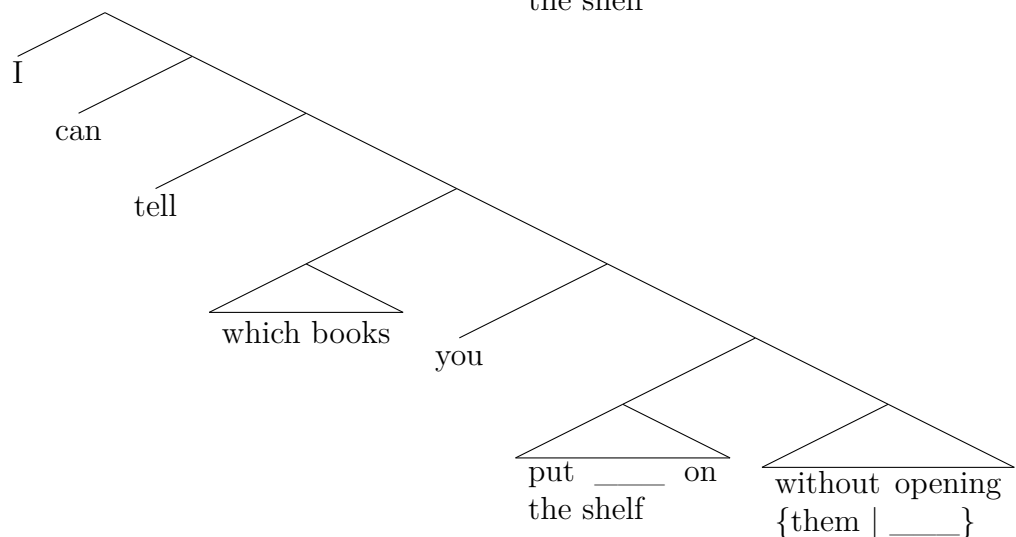
<sup>3</sup>There is an interesting theoretical tension created by the observation that the interpretive properties of the possessive pronoun in (17) are computed in terms of the low position of the displaced phrase while the interpretive properties of the referential expression in (22b) are computed in terms of the high position of the displaced phrase. The literature on reconstruction effects contains a lively debate about a deeper theoretical understanding of the relevant phenomena (see Barss 1986; Chomsky 1993; Fox 1999, 2000; Lebeaux 2009; Postal 1971 and for treatment of the issues in handbooks and textbooks Barss 2001, Bresnan 2001, part IV, Büring 2005, chapter 12, Haegeman 1994, chapter 9, Pollard and Sag 1994, chapter 6). This literature also shows that the conclusion drawn in the text is overly simplistic: A more careful formulation would have said that the displaced constituent behaves as though it was higher in the structure than the gap while not necessarily as high as the filler.

The difference between the two examples is that while example (27a) contains a pronoun as the object of ‘opening’, example (27b) contains a parasitic gap. Example (27a) is ambiguous. One reading can be paraphrased as follows: I can tell which books were shelved by you without me having to open them. The other reading can be paraphrased thus: I can tell which books you shelved without you having read them. Example (27b) on the other hand is unambiguous; it only has the latter type of reading. The ambiguity of example (27a) is a structural attachment ambiguity. The first reading corresponds to the structure in (28a), while the second reading corresponds to that in (28b).

(28) a.



b.



Just like the real gap, the parasitic gap must be c-commanded by the displaced phrase in its high position. This explains why the parasitic gap is impossible in the structure in (28a) and why, therefore, (27b) is unambiguous. As we have seen, the theory of parasitic gaps makes crucial reference both to the fact of displacement and to the high structural position of the displaced phrase and therefore furnishes another example of the high behavior of the displaced phrase.

In this section we have briefly surveyed some evidence showing that in certain respects displaced constituents behave as though they occupied the position of the gap (their low behavior) and that in other respects they behave as though they occupied a different hierarchical position (their high behavior). In the simple cases discussed so far, displacement was always characterized by the presence of a pronounced filler and an unpronounced gap. Things are not necessarily this simple. It is often necessary to postulate abstract, unpronounced fillers (syntactic operators, null pronouns, etc.) and sometimes even pronounced gaps (Alexandre 2012b; Muysken 1980). (The question of whether resumptive pronouns are the residue of displacement is a vexing one and I shall not discuss it here.) In such cases, other properties of displacement, especially those relating to reconstruction and path effects, to be discussed in the next section, are used to diagnose displacement.

### 3 Displacement paths

This section discusses the notion of displacement path and illustrates three types of interaction between a displaced element and the displacement path: morphological reflexes of displacement along the path, binding and scope effects, and constraints on displacement.

#### 3.1 Modeling paths

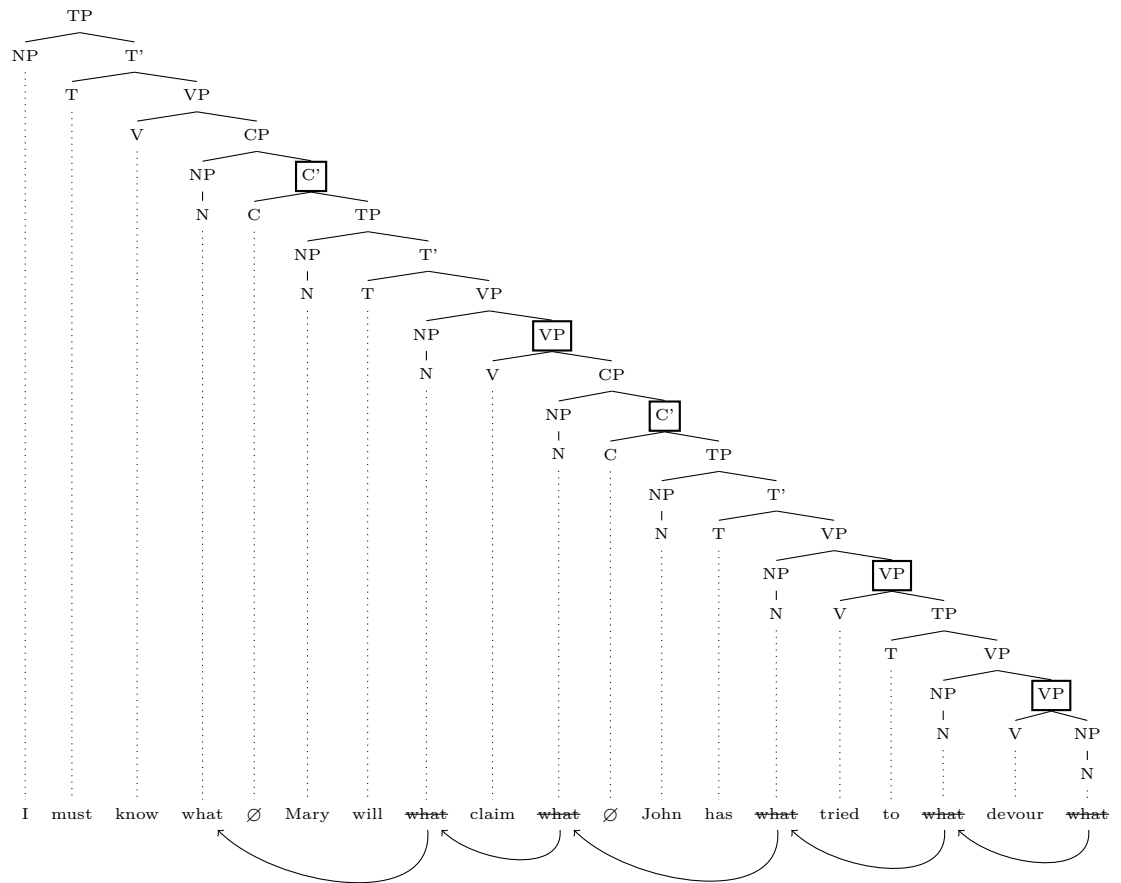
The discovery of unbounded filler-gap dependencies gives rise to the question of how unbounded dependencies are implemented in the grammar. Their unbounded nature is somewhat unusual within the grammar and syntacticians have sought to understand the unboundedness in terms of the iterated application of local operations. We saw in the previous section that the displaced constituent is located in a structurally high position, c-commanding the gap, while at the same time retaining morphological, syntactic and semantic properties of the gap site. how do the grammatical properties associated with the gap end up being expressed on the filler?

Two main metaphors have guided theorizing about the question of how filler-gap dependencies are mediated: The first metaphor is movement, the second metaphor is percolation.

The movement metaphor says that, as part of the process that derives sentences with filler-gap dependencies, the filler moves from the position of the gap to the position of the filler, occupying each at distinct points of a syntactic derivation. In such models unbounded displacement is implemented as an arbitrarily long sequence of short, bounded steps. With the ancillary assumption that movement targets the edge of VP and the edge of CP (Chomsky, 1986, 2000, 2001), example (29) would roughly have the representation in (30). It is important to note how the filler leapfrogs through the structure, entering very local relations with some nodes along the path, those boxed in the diagram, but not with others, particularly the TP nodes in the structure in (30). This metaphor underlies the majority of studies of displacement (see Chomsky 1973, 1977, 1986, 2001; Lasnik and Saito 1992; McCloskey 2002; Ross 1967a

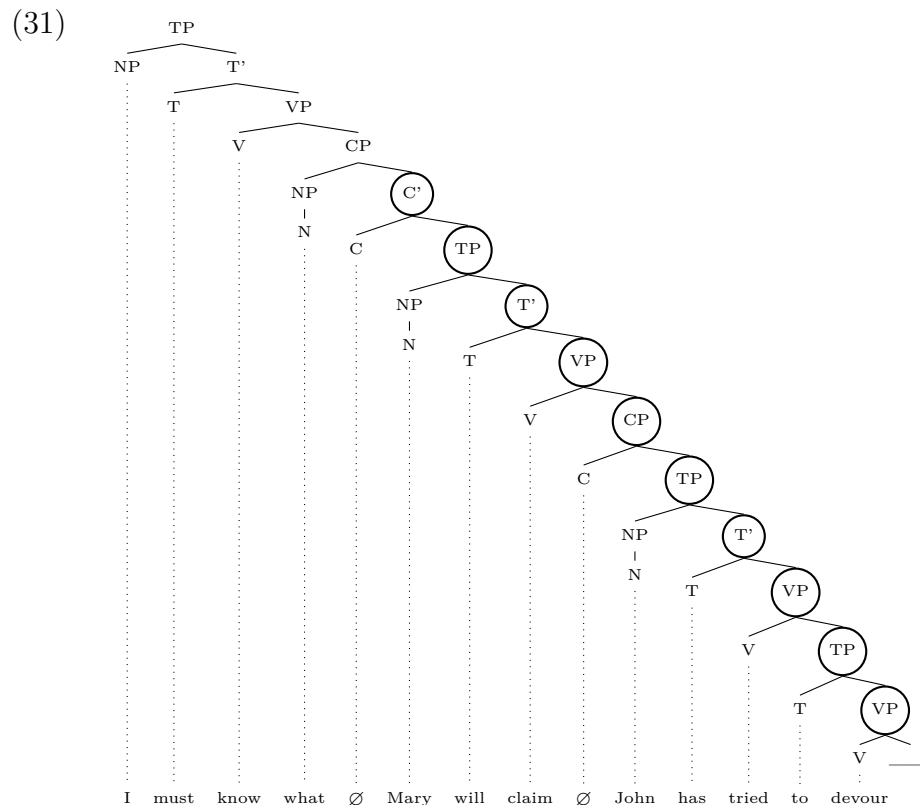
(29) I must know what Mary will claim John has tried to devour \_\_\_\_.

(30)



Under the percolation metaphor, the filler never occupies the site of the gap. Instead, the information that there is a gap, what its category and interpretation are,

and what restrictions are placed on it, percolates through the syntactic structure locally, from node to immediately dominating node (see Bach 1984; Cinque 1990; Kayne 1983; Neeleman and van de Koot 2002; Pesetsky 1982; Pollard 1984; Pollard and Sag 1994; Steedman 1996 among others). This percolation of information is depicted by circling the nodes through which the information percolates in (31).



The distinctions between the two ways of thinking about syntactic displacement are somewhat subtle and need not concern us here.

### 3.2 Path effects

We find that movement along a path can exert an influence on the material crossed, as both types of model straightforwardly predict. The most famous illustration of this type of effect comes from the complementizer alternation in Irish along the path of movement (see McCloskey 1979, 1990, 2002; Noonan 1997). The basic fact is illustrated in (32). In example (32a) no relevant displacement has taken place and features the complementizer ‘go’, while in (32b) the most deeply embedded object, a wh-phrase, has been displaced across three clauses forcing the complementizers along the path to show up in the alternative form ‘a’ instead.



The subscripts N and L on the complementizers indicate that the form has either a nasalizing or leniting effect on the following word, which accounts for the observed additional alternations.

- (32) a. Deir siad go<sub>N</sub> síleann an t-athair go<sub>N</sub> bpósfaidh Síle é.  
 say they C thinks the father C will marry Sheila him  
 They say that the father thinks that Sheila will marry him. McCloskey, 1979, ex. 45 p. 17
- b. cén fear a<sub>L</sub> deir siad a<sub>L</sub> shíleann an t-athair a<sub>L</sub> phósfaidh Síle  
 which man C say they C thinks the father C will marry Sheila  
 \_\_\_\_?

Which man do they say the father thinks Sheila will marry? McCloskey, 1979, ex. 11 p. 55

The alternating complementizers here lie along the path of movement. Complementizers that do not lie along the movement path in the sense of the previous subsection do not participate in the alternation.

We also find that the displaced element can behave for purposes of binding and scope as though it occupied a position along the movement path which is neither the site at which it surfaces nor the gap site. This is illustrated by the examples in (33) (from Barss 2001, p. 676). Example (33a) features an object with a referentially dependent item in the embedded clause: ‘these portraits of {themselves | each other}’. The referentially dependent items are ‘themselves’ and ‘each other’. The example illustrates the requirement that these items have a local (c-commanding) antecedent (though see Pollard and Sag, 1992). The matrix subject ‘the men’ is too far away to serve as the antecedent for ‘themselves’ or ‘each other’.

- (33) a. The men<sub>m</sub> believed that the women<sub>w</sub> had placed (these) portraits of {themselves | each other}<sub>w/\*m</sub> in a scrapbook.
- b. I wonder which portraits of {themselves | each other}<sub>w/m</sub> the men believed that the women had placed \_\_\_\_ in a scrapbook.

When the object is displaced to the beginning of the sentence, the referential dependency of ‘themselves’ and ‘each other’ on ‘the men’ becomes possible, (33b). Curiously, neither the high nor the low position for the displaced element will serve to establish the dependency: the low position is the position of the object in (33a), which, as we saw, is too far away from ‘the men’ to establish the dependency; in its high position, the wh-phrase is not c-commanded by ‘the men’ making it again impossible to establish a referential dependency. The correct prediction can be made only if we assume that the displaced constituent can behave as though it is

located along the displacement path.

The third and most famous type of interaction between displacement and displacement path are constraints on displacement, known in the trade as island effects. Recall that the distance between filler and gap can be unbounded. This does not entail by any means that displacement is entirely unconstrained. Ross 1967b was the first to systematically catalogue constraints on displacement. The discovery of the existence of systematic structural constraints on filler-gap dependencies is among the most important empirical discoveries of modern syntactic theory. Ross 1967b called a particular structural configuration an island if the gap cannot grammatically be situated inside of the configuration while the displaced element is outside. (For excellent introductions to the topic, see Richards, 2014; Szabolcsi, 2006.)

Among the island constraints operative in English I illustrate three that have played a particularly important role in the history of the theory of syntax. The Subject Condition (see Ross (1967b, p. 243) for clausal and Chomsky (1973, pp. 249–250) for DP subjects) bans extraction from subjects. The Subject Condition is illustrated in (34). In each case, the grammatical subject is enclosed in square brackets. The grammatical and ungrammatical examples differ in what constituent acts as the subject. The grammatical controls show that extraction from those constituents is possible in principle, the ungrammatical version show that the sentence becomes degraded when the constituent in question acts as the subject. There are two examples of DP subjects, (34b) and (34d), and one of a clausal subject, (34f).

- (34) a. Which of the Marx brothers will [they] publish a biography of \_\_\_\_ later this year?  
b. \*Which of the Marx brothers will [ a biography of \_\_\_\_ ] be published later this year?  
c. Who is [ there ] a picture of \_\_\_\_ on the wall?  
d. \*Who does [ a picture of \_\_\_\_ ] hang on the wall?  
e. What is [ it ] illegal to chain to the fence?  
f. \*What is [ to chain \_\_\_\_ to the fence ] illegal?

The Complex NP Constraint (going back to Ross 1967b, p. 127) bans movement of elements contained in a clause dominated by a noun phrase (DP) out of that noun phrase. The Complex NP Constraint is illustrated in (35a), the remaining examples in (35) serve as controls.

- (35) Complex NP constraint  
a. \*Which language does Abby want to hire [<sub>DP</sub> someone [<sub>CP</sub> who speaks \_\_\_\_ ] ]?

- b. Abby wants to hire [<sub>DP</sub> someone [<sub>CP</sub> who speaks Greek ]].
- c. Which language is Abby looking for [<sub>DP</sub> a speaker of \_\_\_\_ ]?

Finally, the *wh*-island condition, which varies substantially in the severity of the degradation along several dimensions, bans displacement from an indirect question. It is illustrated in (36) with the only mildly deviant displacement of an object from a non-finite indirect question, (36a), and the very severely degraded displacement of a manner adverb from a finite indirect question, (36b).

- (36) a. ?Which car do you know how to repair \_\_\_\_?  
 b. \*How do you know who \_\_\_\_<sub>who</sub> behaved \_\_\_\_?

We have seen that displacement of *wh*-phrases in English is characterized simultaneously by its unbounded nature and its sensitivity to island configurations, i.e., to specific properties of the displacement path. This is the third illustration of the structure dependence of displacement mentioned in section 1. The same simultaneous characterization of unboundedness with island sensitivity also describes a substantial number of other constructions in English involving gaps but not always overt fillers. Their unbounded nature and sensitivity to islands has led to their classification not only as displacement phenomena but as displacement phenomena of the same type as *wh*-movement (see Chomsky 1977). Significantly, this characterization also describes long-distance dependencies in many other languages (see already Ross 1967a).

While there can be no doubt about the importance of island effects to linguistic theory, the question of the ultimate cause of island effects remains disputed (see Boeckx, 2008a, 2012). Theoreticians hold a broad range of views on how to characterize islands. There are processing accounts (Hofmeister and Sag 2010; Hofmeister, Staum Casasanto, and Sag 2013; Kluender 1998; Kluender and Gieselman 2013; Pritchett 1991; Sag, Hofmeister, and Snider 2007 among others), semantic accounts (e.g., Abrusán 2014; Szabolcsi and Zwarts 1992 among others), accounts that locate island effects at the interface of syntax with semantics (Chomsky and Lasnik 1993; Lasnik and Saito 1992 among others), the interface of syntax with information structure (e.g., Erteschik-Shir 1998, 2007; Erteschik-Shir and Lappin 1979; A. E. Goldberg 2013; Van Valin and LaPolla 1997), or the interface of syntax with phonology (e.g., Abe and Hornstein 2012; Chomsky 1973; Hornstein, Lasnik, and Uriagereka (2003) 2007; Uriagereka 1999). Finally, there are many accounts that locate island effects in the syntax proper (Chomsky 1977, 1986; Cinque 1990; Huang 1982; Manzini 1992; Müller 2011; Pesetsky 1987; Rizzi 1990; Starke 2001; Stepanov 2007 among others).

## 4 The scope of displacement

The preceding sections briefly illustrated properties of displaced wh-phrases, mostly in English. Wh-displacement is a standard example of syntactic displacement: There is clear evidence for two distinct positions (filler and gap); they are distinct both linearly and hierarchically; the filler strongly exhibits properties associated with both positions; there are non-trivial path effects. Wh-displacement belongs to a larger family of structures that have very similar properties. The constructions that are part of this empirical cluster include topicalization, (37a), relative clause formation, (37b)–(37c), and comparative clauses, (37d).

- (37) a. This letter I have read \_\_\_\_ (but not that one).  
b. The letter which I have read \_\_\_\_ is on the table.  
c. The letter I have read \_\_\_\_ is on the table.  
d. I have written more letters than you have read \_\_\_\_.

In each case above, the gap is the object of ‘read’. In (37a)–(37b) there is a clear filler: ‘this book’ and ‘which’, respectively.<sup>4</sup> In (37c) and (37d), there is no obvious filler. Nevertheless, the clustering of properties mentioned in the next paragraph strongly suggests a unified treatment of all four types of structures. A unified analysis is often implemented by assuming that, despite superficial appearances, there is a filler present in (37c) and (37d) after all: the inaudible element referred to as Op (for operator).

The family of structures that behave much like wh-displacement belongs to a larger class of displacement phenomena dubbed non-A movement in Postal, 1971. Postal’s work classified operations on the basis of how they interact with pronominal reference. Section 2 illustrated that wh-displacement shows low behavior when it comes to pronominal reference but high behavior when it comes to disjoint reference effects. Postal’s classification is based on similar facts and, for English, classifies displacement operations into two non-overlapping classes, which Postal called, for lack of a better term, A-operations and non-A-operations.<sup>5</sup> In his semi-

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<sup>4</sup>Note that ‘the book’ in (37b) should not be treated as the filler, since, in languages where there is visible case morphology, the relative pronoun bears the case associated with the gap while the head of the relative clause bears the case associated with it in the superordinate clause. This is illustrated with the German example (i), where ‘den’-*which*<sub>ACC</sub> is the relative pronoun showing the accusative case associated with the gap.

- (i) Der Brief, den ich \_\_\_\_ gelesen habe, liegt auf dem Tisch.  
the.NOM letter which.ACC I read have lies on the table  
The letter I read is lying on the table.

<sup>5</sup>For notation, Postal wrote non-A as  $\bar{A}$ , borrowing set theoretic complement notation. Because of the bar indicating the set theoretic complement, this class of operations is also called

nal paper “On wh-movement,” Chomsky, 1977 demonstrated that there is a subset of Postal’s A-operations including wh-displacement that behave essentially identically when it comes to the position of the filler in the clause and to path effects: the filler is always at the edge of the clause; the path is unbounded; and it can span multiple finite clauses but is sensitive to island effects. McCloskey, 1979 showed that all and only the operations studied by Chomsky give rise to identical morphological path effects in Irish. The operations include wh-displacement, relative clause formation, and comparative clause formation (as well as a range of further structures that cannot be discussed here for reasons of space). These form in many ways the core case of displacement in syntax.

The remainder of this section will mention some other constructions that are more or less similar to these canonical cases of displacement and mention some of their core properties. There is no agreement on the extent to which the analyses of all of these cases should be assimilated to each other. We discuss what is at stake briefly in the concluding section. We will content ourselves with simply illustrating the range of potential further cases of syntactic displacement here without, however, any attempt at comprehensive coverage.

As mentioned above, Postal, 1971 identified two classes of movement operations. We have looked at some examples of non-A-movement above and now turn to A-movement. Examples of A-movement include the passive and raising-to-subject. In the passive, the thematic object appears preverbally in the canonical subject position. In raising-to-subject, the thematic subject of one verb precedes a different verb and agrees with it.

(38) Passive

- a. Newton discovered the calculus.
- b. The calculus was discovered \_\_\_\_.

(39) Subject-to-subject raising

- a. It seems that Leibniz discovered the calculus.
- b. Leibniz seems \_\_\_\_ to have discovered the calculus.

The above examples show an active-passive alternation and the alternation between a canonical structure and a subject-to-subject raising structure. Underscores indicate the position of the gap. A-operations have some important properties of displacement: There is a filler and a gap; just like in wh-displacement, the filler c-commands the gap; the operation is sensitive to constituent structure. These properties are familiar from section 1. Furthermore, there are path effects: The filler can be an unbounded distance away from the gap but may not be separated from it by an island or a finite clause boundary; we often find agreement

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A-bar operations. It is sometimes written as A’.

(for example in gender and number) along the path. These are variations on the properties we illustrated in 3. Clearly low behavior is seen in the fact that the filler must obey selectional requirements imposed on the gap. In stark contrast to wh-displacement, other low behavior is difficult to induce (for discussion see Boeckx 2001; Chomsky 1993, 1995; Fox 1999; Lasnik 1999; Postal 1971). By contrast, high behavior of A-movement is easy to demonstrate using constituency diagnostics, semantic properties like scope, variable binding, and disjoint reference effects. A-operations also display high behavior when it comes to case properties of the filler and person-number agreement: The filler bears the case associated with the high position and enters agreement relations there. This is probably connected with the nature of the high positions targeted by A-movement. The relative paucity of evidence for low behavior of A-movement has led some researchers to propose fundamentally different mechanisms for the analysis of A-movement on the one hand and wh-displacement on the other. Other researchers consider the existing similarities as compelling evidence for a unifying treatment.

A third class of displacement phenomena is head movement. The difference in word order between (40a) and (40b) illustrates head movement. The position of the gap in (40b) corresponds to the position of the verb in (40a). What is being displaced here is a syntactic head. In this example, the finite verb of the clause is displaced from the final position to the initial position.

- (40) a. ...dass {er | der Mann, den ich in Jena kennengelernt habe} den  
 ...that he the man that I in Jena know learned have  
 Brief gelesen hat  
 the letter read has  
 ...that {er | der Mann, den ich in Jena kennengelernt habe} has read  
 the letter
- b. Hat er den Brief gelesen \_\_\_\_?  
 Has he the man that I in Jena know learned have the  
 letter read  
 Has {he | the man I got to know in Jena} read the letter?

Head movement again is sensitive to syntactic structure and can cross linearly arbitrarily long distances. The deliberate complexity of the example above with a complex subject hints at this. We find strong path effects with head movement, which not only obeys island constraints, but obeys the very stringent condition that no intervening heads can be crossed (see Travis 1984 and Koopman 1984; Rivero 1991 for potential counterexamples). For head movement, it is easy to demonstrate low behavior since heads always select, assign case, etc. in the low position and, arguably (see Hall 2015; Lechner 2005 and references cited there

for discussion) also takes scope in the low position. Evidence for high behavior comes mainly from word order, though Baker’s (1988) Government Transparency Corollary and certain analysis of verb-stranding VP ellipsis (L. M. Goldberg 2005) provide additional arguments for a high syntactic position of displaced heads. A further property that has attracted much attention (see Matushansky 2006 and references cited there) is that, at least under the standard analysis, the filler does not, strictly speaking, c-command the gap, being instead adjoined to an element that does c-command the gap. This last property together with the notable lack of semantic evidence for the high syntactic position of displaced heads has given rise to a strand of analyses that sharply divide head movement from syntactic displacement phenomena in terms of analytical approach and, indeed, deny there is a high position involved in head movement at all (Adger 2013; Boeckx and Stjepanović 2001; Brody 2000; Bye and Svenonius 2012; Hall 2015 among others).

The three types of displacement discussed so far (A-movement,  $\bar{A}$ -movement, and head movement) differ vastly in their properties. They differ so much that some theories deny either A-movement or head movement of both the status of displacement in syntax. Nevertheless, all three are considered syntactic displacement by many theoreticians working within the Principles & Parameters and Minimalist frameworks. As discovered by Rizzi, 1990 (see also Chomsky 1995; Cinque 1990; Rizzi 2001; Starke 2001), all three types obey the same shape conservation constraint known as Relativized Minimality. Relativized Minimality says that a filler in a structural position of type  $\alpha$  cannot be separated<sup>6</sup> from its gap by another element  $\beta$ , which is of the same structural type as  $\alpha$ . Rizzi recognized three structural types: A-positions,  $\bar{A}$ -positions, and head positions. Relativized Minimality can be expressed as the following slogan: Likes do not cross likes. The fact that this shape conservation principle governs all three types of structures suggests that they are all instances of the same general kind: syntactic displacement.

In the displacement phenomena mentioned so far, the filler always precedes the gap. This is not necessarily the case, though. The standard analysis of example (41), where the object uncharacteristically for English, is separated from the verb by a prepositional phrase involves the gap preceding the filler.<sup>7</sup>

- (41) He read \_\_\_\_\_ with great interest all the letters that he had found in the sealed box on his aunt’s attic.

Ross first noticed that, at least in English, gap and filler are never separated by a finite clause boundary when the gap precedes the filler. This makes (41), which exemplifies a structure called heavy NP shift, similar to A-movement. However,

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<sup>6</sup> $\beta$  separates  $\alpha$  from  $\alpha$ ’s gap iff  $\alpha$  c-commands  $\beta$  and  $\beta$  c-commands  $\alpha$ ’s gap.

<sup>7</sup>See Beerman, LeBlanc, and Riemsdijk 1997; *Rightward Movement in a Comparative Perspective* 2013 for further examples of gap-filler structures and a sampling of syntactic analyses.

in most other respects, heavy NP shift patterns with wh-dislocation, a case of  $\bar{A}$ -movement. Again, the similarities to syntactic displacement have inspired unifying analysis and the differences have been used to motivate substantially different approaches.

Another word order phenomenon raising intricate classificatory and analytical problems is A-scrambling, a process characteristic of OV languages. It is exemplified here by the alternation in (42). The order in (42a) arguably represents the canonical order (Frey, 1993, 2015; Frey and Pittner, 1998; Lenerz, 1977) while in (42b) the indirect object has scrambled across the locative prepositional phrase and in (42c) the direct object has scrambled across the indirect object.<sup>8</sup>

- (42) a. Ich denke, dass er in einem Park einer Frau ein Buch gegeben  
 I think that he in a park a woman a book given  
 hat.  
 has  
 I think that he gave a book to a woman in a park.
- b. Ich denke, dass er einer Frau in einem Park \_\_\_\_\_ ein Buch  
 I think that he a woman in a park a book  
 gegeben hat.  
 given has
- c. Ich denke, dass er in einem Park ein Buch einer Frau \_\_\_\_\_  
 I think that he in a park a book a woman  
 gegeben hat.  
 given has

A-scrambling, like the other displacement phenomena we have seen, is sensitive to structure, the filler c-commands the gap, etc. (for an overview see Abels 2015; Frey 2015). Like in wh-displacement, the fillers in (42b) and (42c) bear the case associated with the gap. Like A-movement and heavy NP shift, A-scrambling cannot cross finite clause boundaries. When we look at the interaction of A-scrambling with referential properties, a mixed A/ $\bar{A}$  pattern emerges. Indeed, any attempt to classify scrambling as either A- or  $\bar{A}$ -displacement is doomed to fail. This is known as Webelhuth's paradox (Webelhuth 1992), which was widely discussed in the literature starting in the 1990's (Corver and Riemsdijk 1994; Karimi 2003; Mahajan 1990 and references cited there). Again, while some researchers have found the similarities between scrambling and core syntactic displacement compelling and have brought the same tools to bear on the analysis of both, others have emphasized the differences and used substantially different theoretical tools in the

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<sup>8</sup>All OV languages appear to have scrambling across adverbials (Haider 2005) while inversion of this type of objects and subjects with respect to each other is more restricted and is virtually absent in Dutch, for example.



analysis of both (Haider 2006; Haider and Rosengren 1998; Kuthy and Meurers 2001; Neeleman 1994; Reape 1994 among others).

While the phenomena mentioned so far all share the property of having a silent gap, not all analyses agree that this is a necessary property of syntactic displacement. Thus (Alexandre 2012a; Muysken 1982) suggest that in some languages gaps may receive an invariant but audible pronunciation. More vexing problems are raised by resumptive pronouns. We mentioned above that relative clauses in English are a typical example of syntactic displacement. However, in many languages the position of the gap in relative clauses is occupied by a pronoun, a so-called ‘resumptive’ pronoun. While such structures are still sensitive to structures and the filler *c*-commands the resumptive pronoun, they can behave substantially differently from canonical syntactic displacement structures. For example, the case of filler and resumptive pronoun may mismatch (Boeckx 2003), the filler can relate to a resumptive pronoun inside of a syntactic island (Ross 1967a see also Boeckx 2003 and references cited there), and referential and semantic effects can be substantially different from those found with *wh*-displacement (see Aoun, Choueiri, and Hornstein 2001; Doron 1982; Sells 1984; Sharvit 1999 among many others). Such observational differences are often, though by no means always, taken to speak against a unified account of syntactic displacement and pronominal resumption.

A case that may look even more exotic at first blush is provided by cases like (43) (and other so-called ‘covert movement’ constructions, Huang 1982; May 1977, 1985), where there is no gap and no visible displacement at all.

(43) A guard is posted in front of every building.

However, it should be noted that the scope of the quantifier (‘every building’) includes the subject. It has been observed that by default, one element takes another in its scope only if the first *c*-commands the second. In order to achieve this here, we need to invoke displacement of ‘every building’ to a position *c*-commanding the subject (‘a guard’). Support for an analysis assimilating the grammar of scope taking to the grammar of displacement comes from the observation that covert scope shifting is sensitive to structure, targets a *c*-commanding position, is subject to syntactic islands and is unbounded according to recent experimental work (Syrett and Lidz 2009, 2011; Tanaka 2015). Again, analyses differ.

This section has provided a brief and superficial sampling of the different types of constructions that have been analyzed by one theory or other a syntactic displacement along with *wh*-displacement discussed in the first three sections. The list is by no means exhaustive. It is intended merely to give a sense of the range of properties that these constructions have and to convey a sense of the theoretical challenges posed by these structures: How to explain the commonalities? How to

explain the differences?

## 5 Theoretical outlook

The first three sections of the present article introduce the phenomenon of displacement in syntax on the basis of wh-displacement in English. Displacement is a diagnostic for constituent structure in the sense that it affects only (but not all) constituents. In the simplest and clearest cases, displacement phenomena involve a single constituent that shows properties associated with two distinct linear and hierarchical positions. Typically, one of these two positions c-commands the other and the displaced phrase is pronounced in the (high) c-commanding position. Displacement also shows strong accompanying path effects: morphological changes along the path, evidence for structural placement of the displaced constituent along the path, as well as island effects and other constraints on displacement.

Section 4 surveyed a number of constructions and construction types with properties that can be vastly different from those of wh-displacement but which, nevertheless, have been analyzed as displacement, that is, the analysis uses the same theoretical tools as the analysis of wh-displacement. The question whether such unifying analyses are truly explanatory remains open at present. An analysis counts as explanatory to the extent that properties of the particular structure follow from simple, general principles. For example, all structures we have surveyed (except for head movement) relate two positions, one of which strictly c-commands the other. Minimalist analyses claim that the c-command property can be explained by the assumption that we are dealing with displacement implemented uniformly as ‘internal merge’. This is so, because internal merge obeys the c-command property for principled reasons (Chomsky 1995, 2008). However, according to Koster, 1986; Neeleman and van de Koot, 2002, the c-command property characterizes not only syntactic displacement but all syntactic dependencies. This undermines the argument for a unification in terms of displacement substantially. As another example of an explanation made available by a unifying account (of at least some of the processes studied here), we can mention Relativized Minimality. This was Rizzi’s (1990) principle according to which likes do not cross likes. The principle explains a large number of facts on the assumption that A-movement,  $\bar{A}$ -movement, and head movement are all modeled as syntactic displacement.

Another important issue that a theory of syntactic displacement will have to deal with is the way various operations interact. For example, can one and the same element undergo two separate displacement operations? And if so, in what order? In other words, can the expected filler site of one dependency act as the gap for another? Similarly, can a displaced element host a gap and, if so, under what circumstances? Syntactic theory is only beginning to address these ques-

tions. Some facts have been uncovered but at the time of this writing there is no consensus on what the main generalizations are, let alone how to explain them. For some conflicting views see Abels 2007; Grewendorf 2003; May 1979; Müller 1998, 2010; Rizzi 2006; Takano 2000; Wexler and P. Culicover 1980; Williams 2002 and references cited there. The touchstone of an explanatory theory will be the extent to which the varied properties of the constructions surveyed in section 4 and the interactions between them can be predicted. In this sense, Williams 2002 (despite the empirical shortcomings noted in Abels, 2007) stands out as the most explanatory of the existing approaches: Under Williams' theory all properties of a displacement operation can be deduced on the basis of the relative structural height of the high position alone.

Displacement phenomena have been and will continue to be extensively studied by syntacticians. Their enduring interest derives from the fact that the complex interactions between displacement and other aspects of syntax offer a powerful probe into the inner workings and architecture of the human syntactic faculty.

## Further reading

An understanding of the more technical literature cited throughout this paper will require previous knowledge of the relevant syntactic framework at a level equivalent to at least a graduate level textbook.

Richards, 2014 provides an overview of  $\bar{A}$ -movement, that is, the kind of displacement structures that the first three sections are based on.

Background to the various diagnostics for high and low behavior of displaced wh-phrases can be found in the following sources. Truswell, 2014 is an introduction to the generalizations about variable binding and disjoint reference and theories thereof. Barss, 2001; Sportiche, 2006 discuss the interaction displacement with variable binding and reference. Polinsky and Preminger, 2014 provide background for the understanding of the case effect discussed in section 2.1, Merchant, 2006 discusses the elliptical construction used to illustrate high behavior in section 2.2.

Background on the various theories mentioned in section 3 can be found in Alexiadou and Kiss, 2015, Volume 2 Section IV or Carnie, Sato, and Siddiqi, 2014, Part V. A good introduction to island effects can be found in Roberts, 1997, chapter 4, and Boeckx, 2008b, chapter 2 provides a useful introduction to morphological path effects.

Handbook level introductions to some of the main phenomena mentioned in section 4 are provided in Baltin and Collins, 2001 for A-movement, Roberts, 2001 for Head Movement, Szabolcsi, 2001 for quantifier raising, and Abels, 2015 for scrambling.

Rizzi, 2001 and Corver, 2006 discuss two issues mentioned in section 5: the

issue of Relativized Minimality and one type of interaction between different displacement phenomena ('freezing effects'), respectively.

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