Variation at the Syntax-Semantics Interface:

Evidence from Gapping*

Luis López                          Susanne Winkler
University of Illinois-Chicago       Universität Tübingen

Abstract:
Some languages move wh/focus-phrases to a clause internal position, which can be identified as Spec,v [Bade (Tuller 1992, Kidwai 1999), Aghem (Watters 1979), Hungarian (Horvath 1986)]. Interestingly, it may well be the case that English also allows for wh/focus-phrases in Spec,v. Johnson (1994 and subsequent work) has argued that the second conjunct of a gapping construction is a vP as in John bought books and [vp Mary CDs]. If this argument is on the right track, then it is not surprising that you can have wh/focus-phrases in English gapping examples, as in I wonder which books Mary gave to John and which CDs to Mary or in the topicalized construction The beans, Mary cooked, and the potatoes, Henry (examples by Johnson). The challenge is to explain why these sentences are grammatical while wh/focus-phrases in Spec,v are so categorically ungrammatical in any other context. We propose an analysis based on soft rules that can be ignored if the syntactic context is appropriate.

1. Introduction

The general topic of this paper is cross-linguistic variation. In particular, we want to investigate what role the interpretive systems play in what appears to be syntactic variation. This line of thinking has not been explored extensively in the generative tradition to date.

Two recent papers are our immediate predecessors. Pesetsky (1998) proposes that optimality principles at the syntax-phonology interface account for some variation concerning the structure of COMP, arguing, however, that core computational principles are not soft. Chomsky (1999) discusses the absence of Germanic scrambling/object shift in Romance and attributes it to a parameter at the syntax-semantics interface. The idea that we want to pursue is that interpretive rules at the syntax-semantics interface are universal but ranked, which

*Acknowledgments: We thank the audiences of a number of workshops for their comments, specifically the audience of the "Ellipsis and Information Structure" workshop at the ZAS in Berlin, the "Contrast"-workshop at the University of Leipzig, and the UPenn-Tübingen workshop "Linguistic Data Structure: Theoretical, Methodological, Descriptive Issues" at the University of Tübingen. We particularly thank Bernie Drubig, Remus Gergel, Winnie Lechner, Jason Merchant, David Pesetsky, Kerstin Schwabe and Nina Zhang for comments on this paper. The first author is also indebted to the ZAS for inviting him as a guest researcher in July 2000 and to the University of Tuebingen for inviting him in August 2000. Special thanks goes to Kirsten Brock for brushing
gives rise to variation. This paper is aimed at showing initial evidence that this research program is feasible.

It was not until Chomsky (1981) that syntacticians in the generative tradition had the kernel of a theory of syntactic cross-linguistic variation, the so-called Parameter Theory. The most interesting and influential development of parameter theory is Borer's (1984) proposal that all apparent syntactic variation is to be found in the lexicon: a consequence of specific properties of functional categories. The contrast between (1) and (2) is a celebrated example, from Emonds (1976): the adverb can stand between the verb and the direct object in French because the verb raises to INFL in French, while it cannot in English (where we could have either downwards affix-hopping or covert movement). This movement is triggered by the features of INFL, which under one version of the theory (Chomsky 1993) are “strong” in French but “weak” in English:

(1) Pierre joue doucement t(V) la guitare.

(2) Peter slowly plays the guitar.

Borer in effect proposes that syntax itself is invariant, a hypothesis that we wish to maintain. However, as we will argue, not all variation can be reduced to lexical variation. Take the examples in (3), from Tuller (1992:302, 305):

(3) a. gafa-n KE viiriidgwarxn?

caught who giant-rat

'WHO caught a giant rat?'

b. zaneeNaa, tlm t’a-g D<s>MAAN

up the English, and more than that, for being the best and most competent language consultant one could ever
In Western Bade, as well as in other Chadic languages, wh-phrases and focus-phrases appear immediately to the right of the verb (apparently raised to INFL).\(^1\)\(^2\) It is commonly assumed that wh-phrases and contrastive foci appear in Spec,C in English and many other languages, (see Drubig 1994 for arguments that apparent in situ contrastive focus in English actually involves covert movement to Spec,C). However, it seems that wh/focus-phrases in Western Bade must appear on the left edge of the verb phrase (Tuller 1992, Kidwai 1999).\(^3\) We argue that this cross-linguistic difference is the result of different cross-linguistic interpretive rules in section 3. In section 4, we discuss another argument aimed in the same direction taken from Chinese focus movement.

In sections 5-7, we change gears and look more closely into the structure of interpretive rules. The crucial piece of evidence that we use is English Gapping, exemplified in (4):

\[
(4) \quad \begin{align*}
\text{a.} & \quad \text{John bought many books and [? Peter many pencils]} \\
\text{b.} & \quad \text{Bill asked which books we gave to Mary and [? which CDs to Jane]}
\end{align*}
\]

\[^1\] A note of caution is in order here. Typically, syntax papers mention that a certain constituent is focused without explaining exactly what they mean by that. However, the term focus can refer to several different concepts. In the first place, we have the information focus/contrastive focus distinction (Rochemont 1986 and many others), relevant in all grammatical domains. Second, contrastive topic and contrastive focus are sometimes teased apart, but often they are not. Contrasts are all semantically similar. As argued for by Büring (1999) and Vallduví and Vilkuna (1998), both topics and contrastive foci evoke a set of alternatives. Additionally, in the grammars of many languages like English, foci and topics are generated by movement (but in others topics seem to be base-generated in the left periphery). For our purposes, we can put all contrasts together, following Büring and Vallduví and Vilkuna’s intuitions, while information focus should be considered a separate phenomenon. For simplicity, we use the term focus to refer to a contrast that evokes alternatives.

\[^2\] There is variation among the Chadic languages concerning the grammar of wh/focus. See Tuller (1992) for details.
The constituent has generally been considered a full clause (Ross 1967). However, Johnson (1994, 1997) has provided evidence that is actually a verb phrase. If so, then wh-phrases and focus-phrases in English can appear on the left edge of the verb phrase, making it look more like Western Bade than it seemed at first sight. This will be discussed in section 8 and a provisional hypothesis, based on ranked rules, will be presented. But first we need to lay out our main assumptions, which we undertake in the following section.

2. Assumptions

We adopt the main assumptions of the Minimalist Program (MP), particularly those in Chomsky (1995, 2000). Within the MP, what is usually referred to as the module syntax is re-christened as the Computational System of Human Language (C\textsubscript{HL}). Two operations form part of C\textsubscript{HL}: Merge and Agree.

Merge involves selecting two items and and combining them to form a set. Additionally, either or is to be chosen to be the label for the set. Selection may take place from among items in a numeration – an indexed array of lexical items – or one of the selected items may be a structure.

The resulting basic clause structure for a transitive sentence is as follows, omitting items in specs, etc:

(5) \[
\begin{array}{c}
\text{CP} \\
\text{C} & \text{TP} \\
\text{T} & \text{vP} \\
\end{array}
\]

A third possibility, that we will not have space to discuss here, is to have wh/focus-phrases in Spec,T, as argued by Zubizarreta (1998) for Spanish, among others.
Agree is triggered by a functional category that has a [-interpretable] feature. This [-interpretable] feature needs to match and agree with a [+interpretable] version of the same feature in a lexical item. The lexical item itself has a [-interpretable] feature that signals its availability for agreement. Thus, the functional head can probe in its c-command domain until it finds a term with matching features. Displacement occurs if the functional category has an additional feature (strength in Chomsky 1995, EPP in Chomsky 2000) that can only be satisfied if the agreeing term is pied-piped to its spec.

Having set up the playing field in these sparse terms, we can ask the question originally posed at the beginning of this article: where does language variation come from? We can discard off the bat the possibility that the operations themselves can be subject to variation. In other words, Merge, Agree and Move/Pied-pipe will take place when they must and their specifications are universal. For instance, it would be highly unlikely that Merge in one language would involve two terms while in another it would involve three; or that movement in one language would be triggered by [-interpretable] features while in another language it would be triggered by some other mechanism. However, we can pursue Borer's proposal, and locate a source of language variation in the feature structure of a functional category: so a certain movement takes place in language A and not in language B because the relevant functional head in A has a certain feature but the equivalent in B does not. This provides an analysis of the English/French contrast in (1) and (2).

Consider now wh-movement as analyzed in Chomsky (2000). In his analysis, a head Hi must have a [-interpretable] feature, call it [f1], that matches a [+interpretable] feature in
Additionally, the wh-phrase must have another [-interpretable] feature, call it [wh], that makes the wh-phrase visible for agreement/attraction. For simplicity, we assume that [f1] triggers movement. For Chomsky, H1 is identified with C, but, as we have seen above, wh-phrases do not move to the left periphery in some languages: in Western Bade, wh/focus phrases clearly make a shorter movement. Therefore, it seems that other heads can have the attracting [f1] feature.

Let's see if we can extend this sketchy framework to focus movement. Presumably, there should be a head H2 which must have a [-interpretable] feature [f2] which matches a [+interpretable] version in the focus phrase. Additionally, the focus phrase must have a [-interpretable] feature that signals its receptivity to Agree, call it [foc].

Interestingly, it has been argued that at least in some languages the head that licenses focus-phrases is also the head that licenses wh-phrases, so that wh-phrases and focus-phrases may all end up competing for the same position, unless a language allows for multiple instances of Spec,C. For instance, that seems to be the case in Hungarian (Horvath 1986), Basque (Ortiz de Urbina 1987), Spanish (Zubizarreta 1998), Chamorro (Chung 1998) and many others. It also seems to be the case in Western Bade, since focus-phrases and wh-phrases can be found in the same spot. We will adopt then the working hypothesis that wh-phrases and focus-phrases are lifted to the checking domain of the same head, although the head itself may vary from language to language. In English, we assume that wh/focus-phrases move to Spec,C.

More crucially for our purposes, we would like to claim that one and the same feature triggers wh-movement and focus-movement. In other words, the [-interpretable] [f1] feature that agrees with a wh-phrase and the [-interpretable] [f2] feature that agrees with a focus-phrase are one and the same. This entails that the corresponding [+interpretable] features of

---

4 Chomsky calls [f1] Q, probably suggesting Question. However, not all wh-phrases are questions, so we prefer to use the more neutral [f1].
the goal must overlap to a considerable extent – not a surprising conclusion, we believe, if both are variants of the feature [Det]. We present two pieces of evidence in favor of the claim that \([f_1]= [f_2]\).

First, focus-phrases and wh-phrases create Relativized Minimality effects for each other (see Lasnik and Saito 1992:81, 96). This is exemplified in (6):

(6) a. *The BOOKS Peter said when he didn't buy t t .

   b. *When did Peter say that the CDs he didn't buy t t ?

In the MP, Relativized Minimality has been reconceptualized as the Minimal Link Condition (MLC), which became part of the operation Attract in Chomsky (1995:267). The import of the MLC is that if a head \(H\) probes in its c-command domain for a feature \([f]\), then it will agree and attract the first instance of \([f]\). A probe cannot skip a term with matching features in order to look for a lower term. The MLC is schematized in (7):

(7) * \([f] > [g] > t[f]\)

where \(a > b\) means \(a\) c-commands \(b\) and \([f]\) and \([g]\) are features of the same type.

If the MLC is to be adopted, then it is clear that the ungrammaticality of (7) can only be explained if we assume that the feature that triggers movement of wh-phrases and the feature that triggers movement of focus-phrases are one and the same.

The second piece of evidence comes from the analysis of Chamorro wh-movement and focus-movement developed by Chung (1998, and earlier work). Chung shows that wh-movement triggers agreement on C and on the lexical verb; interestingly, she shows that focus movement triggers exactly the same sort of agreement (a phenomenon that is not unique to Chamorro, see the references in her book). This we take to be evidence that the feature that
triggers focus-movement is the same one that triggers wh-movement. In (8), we show two examples indicating nominative wh-agreement on the verb with italics:

(8) a. Haywe \textit{fuma'gaswe} we kareta.

\begin{flushright}
\textit{who agr-wash the car}
\end{flushright}

'Who washed the car?'

(Chung 1998:236)

b. Mañ-odd\textit{a balutan ya PATGUN humuyung}.

\begin{flushright}
\textit{find bundle and.then child agr-go.out}
\end{flushright}

'They had found a bundle and A CHILD came out of it'

(Chung 1998:268)

The last issue to be discussed in this section is interpretation. We adopt the simplest possible model: syntax interfaces with various interpretation modules which, quite naturally, are sensitive to syntax. In other words, the interpretation modules have rules, call them INT, that assign certain interpretations to terms located in certain syntactic positions. For instance, in English, the interpretation module can read that there is a constituent in Spec,C which bears a wh-morphology; depending on the structure, the wh-phrase may get a question, relative or pseudo-question interpretation. Likewise, a constituent in Spec,C can also be interpreted as focus by the relevant module. As we will argue, if the constituent is not in “the right place” at the end of the derivation, the interpretive modules can't read it. So, if an English wh-phrase is not in Spec,C, it cannot be interpreted. What “the right place” is is what is subject to language variation.

The model of grammar that we have can be schematised in the following manner:

---

5 Lechner (p.c.) points out that the phenomenon of participle agreement in French might be relevant in the present discussion. Consider the examples (i) and (ii), from Kayne (1989):

(i) \textit{La table a été repaiente.}

(ii) \textit{La table que j'ai repaiente.}

In (i), participle agreement is triggered in a passive sentence, in (ii) in a relative clause. Could this be taken as evidence that different types of movement can trigger the same type of agreement? No. It could be argued (it has
We have a vocabulary of lexical and functional items that combine forming complex structures that must then be interpreted by a number of performance modules: a phonetic module (PF), a logico-semantic module (LF), possibly more. Where is linguistic variation to be found? The combinatory mechanism is invariant. We know that at least some syntactic variation can be traced to the lexicon, but, as we will argue, not all. Instead, we argue that some syntactic variation is to be traced to the performance modules.

The structure of the ensuing argument is as follows: we identify a syntactic difference between two languages and show that it can't be due to properties of a functional category. By *Modus Tollens*, the culprit must be an interpretive module.

3. **Wh/focus-movement in Western Bade**

As we mentioned in the introduction, wh-phrases and foci appear to the immediate right of the verb in Western Bade. Here we repeat the relevant examples for the reader's convenience:

\begin{align*}
\text{(3) a. } & \text{gafa-n KE } \text{viiriidgwar}\text{n?} \\
& \text{caught who giant-rat} \\
& \text{`WHO caught a giant rat?'} \\
\text{b. } & \text{zaneelNaas, } \text{tl`mp`ta-g } \text{D}\text{MAAN} \\
& \text{gown-my tore wood}
\end{align*}

been argued) that in either case movement to the final position goes in two steps, the first one displacing the constituent to Spec,Agr or Spec,Part. This first movement would be triggered by the same feature in both cases.
Tuller argues that the main verb raises to INFL. Further, she argues that there is an A'-position in the VP area where wh-phrases and foci are licensed. We assume that wh-phrases and foci in Western Bade are in Spec,v (see also Kidwai 1999:234):\(^6\)

Thus, in English wh-phrases and foci move to Spec,C and in Western Bade they move to Spec,v. We can consider two hypotheses to account for this difference. The first one is a traditional Principles and Parameters formulation:

(11) Hypothesis 1: the difference involves a syntactic parameter.
   a. Feature [f] that triggers movement of wh/focus is in v in Western Bade.
   b. Feature [f] that triggers movement of wh/focus is in C in English.

\(^6\) This is also the structure proposed by Kennelly (1999) for the grammar of wh/focus in Turkish, minus the directionality of the specifier. Horvath (1986) also proposes that wh/focus-phrases are in Spec,V in Hungarian, but the matter is disputed (see Brody 1990, among others).
In other words, (11) postulates that the morpho-syntactic properties of \( v \) and \( C \) can vary. \( v \) is set up in such a way in Western Bade that it includes \([f] \) in its feature matrix while in English \([f] \) is in the feature matrix of \( C \).

The second hypothesis suggests that the difference lies not in the lexicon but in how structures are interpreted:

\[
(12) \quad v \text{ can have } [f] \text{ in English and Western Bade.}
\]

Hypothesis 2: the difference involves interpretive rules.

a. Spec,\( v \) receives INT in Western Bade.

b. Spec,\( C \) receives INT in English.

INT should be understood not as a single rule but as a family of rules which take care of wh-phrases and foci and assign them an interpretation. Application of INT can be triggered by the checking of the \([f] \) feature.

In the following, we present an argument that hypothesis 1 is false and that English \( v \) does have \([f] \). Since we do not see any alternatives, we will conclude that hypothesis 2 must be right. The argument can be summarized as follows: there is evidence that in English wh/focus-phrases do move to Spec,\( v \). Consequently, the difference between English and Western Bade does not involve availability of \([f] \).

Chomsky (1986) already hypothesized that wh-phrases adjoin to VP on their way to Spec,\( C \) (see also Chomsky 1995:302 and 2000:fn 49). More recently, Fox (2000: chapter 5) has confirmed Chomsky's intuition. Consider the sentence in (13):

\[\text{(13)}\]
(13) [Which of the papers that he wrote for Mrs. Brown] did every student get her to grade t?

In (13), the wh-phrase must reconstruct so that the variable, here the pronoun he, is c-commanded by its binder, the quantifier every student. The question is to which position should the wh-phrase reconstruct? Reconstruction to the original position t causes a violation of Binding Theory: the pronoun her would c-command Mrs Brown, in violation of Condition C. However, the wh-phrase must reconstruct somewhere, so that the quantifier can bind the pronoun. It follows that the wh-phrase must reconstruct to an intermediate position, higher than the object and lower than the subject. Notice that the same result obtains for focus topicalization in (14):

(14) At least ONE of the papers that he wrote for Mrs. Brown did every student get her to grade.

Let's assume, essentially following Fox (2000) and Chomsky (1999), that the wh-phrase has stopped at the edge of the vP. Thus, we have an A'-position in the vP edge for wh-phrases and focus-phrases. This position can't be the final landing site for A'-movement. Notice that since the focus/wh-phrase must reconstruct in Spec,v, we can't simply maintain the idea that intermediate traces are deletable and irrelevant at the interfaces.

But, how did the wh-phrase or focus-phrase get to stop at Spec,v? The inevitable conclusion is that v must have [f] to trigger movement of wh-phrases and foci to Spec,v in English. Consequently, the difference between English and Western Bade does not concern the morpho-syntactic properties of v. Therefore, it must involve the module that interprets
structures (hypothesis 2). In other words, wh- phrases and focus-phrases in English can't be interpreted in Spec,v.\(^9,10\)

4. **Focus in Chinese**

In this section, we use a different data base to provide another piece of evidence that interpretive requirements give rise to surface syntactic structures. The structure of this argument is the following: recall that we concluded that movement of wh-phrases and focus-phrases is triggered by the same feature \([f]\). If a head -say v- has \([f]\) in a certain language, then we should be able to find both foci and wh-phrases in Spec,v. If we find one sort of phrase but not the other, we must conclude that this state of affairs can't arise because of presence or absence of \([f]\), which would affect both wh and focus-movement. Again, given our paucity of choices, INT should be guilty (and therefore, INT is probably a cover term for two different interpretation rules, as suggested above).

As a matter of fact, focus and wh-movement are dissociated in a number of languages. Take Mandarin Chinese. In this language, a position between the subject and the verb is the landing site of focus constituents (Tsai 1994, Gasde 1998):

\[(15) \quad \text{Wo ZHE ben shu bu yao.} \quad \text{I \ this \ CL \ book \ not \ want \ CL=classifier} \]

'It is this book that I don't want' \quad \text{(Gasde 1998:59)}

---

\(^9\) Additionally, in Kikuyu (Clements 1984) and Chamorro (Chung 1998) wh/focus-phrases agree with every verb along the way, although they surface in Spec,C. This can be taken as additional evidence that even if movement of wh/focus-phrases ends in Spec,C, v is also endowed with the feature \([f]\) and wh/focus phrases must stop at every Spec,v. The analysis, however, is somewhat complex and beyond the limits of this paper.

\(^{10}\) For the argument to be complete, we should show that in Western Bade long wh/focus-movement also ends in Spec,v. Additionally, our argument would be strengthened if we could show that C in Western Bade also has \([f]\). We have not yet been able to check whether this is the case or not with a native speaker.
Following the standard assumption that the Chinese verb does not move to I overtly (Tsai 1994), this focus position must be Spec,v. Interestingly for our purposes, wh-phrases can't occupy this same position; instead, as is well known, they must remain in situ:

(16)  a. Akiu mai-le shenme?
      Akiu  buy-prf  what

       b. *Akiu shenme mai-le?
         'What did Akiu buy?' Niina Zhang, p.c.

The sentence in (15) shows that Chinese v has [f]. So, the ungrammaticality of (16b) can't be caused by unavailability of [f]. Where does this ungrammaticality come from? The explanation again must come from the interpretive modules. Let's assume that in Chinese wh-phrases can't be interpreted in Spec,v but are interpreted in Spec,C, as in English (further assuming covert raising of wh-phrases as in Huang 1982, Pesetsky 2000:92, among many others). Moreover, we need to build on a well known generalization: in-situ constituents are ambiguous, since they can be interpreted in any appropriate position that c-commands them; on the other hand, constituents that have moved overtly must be interpreted where they are found. Take for instance the examples in (17):

(17)  a. Who remembers what John bought?

       b. Who remembers where John bought what?

Let's focus on 'what'. In (17a), 'what' must be interpreted where it is, whereas in (17b), it can be interpreted as if it were in the matrix CP, giving rise to pair-list readings (a point originally
made by Baker 1970). Additionally, notice that 'where' can't give rise to pair-list readings. One (sketchy) way of analyzing this could go along the following lines: movement is either entirely overt or entirely covert, but a constituent cannot take an overt step and then a covert one.\footnote{This should be relativized to type of movement, so, e.g., one can have overt A-movement followed by covert A'-movement, but not overt A'-movement followed by covert A-movement (thanks to Winnie Lechner for pointing this out to us). We also abstract away from the wh-expletive phenomenon in German and other languages.}

Let's go back to Chinese. If the Chinese wh-phrase stays in situ, it raises covertly to Spec,C via Spec,v. However, if the Chinese wh-phrase moves overtly to Spec,v, it cannot move covertly to Spec,C. Consequently, the wh-phrase is not in a position where it can be interpreted at LF, and the sentence is ungrammatical.

To conclude, the possibility of overt movement of focus-phrases but not of wh-phrases in Chinese provides evidence that some cross-linguistic variation must be traced to the interpretive modules.

5. Midway conclusions

Let's recapitulate what we have so far. Our starting point is a model of grammar as in (9), and the original question is what the sources of cross-linguistic syntactic variation are. We immediately discarded $C_{HL}$ as a possible locus of variation. $C_{HL}$ consists of the operations Merge and Agree (possibly with Pied-piping) and its properties should be fixed. One possible source of variation is the lexicon and, in particular, features of functional categories that may or may not trigger movement. This line of research has been fruitfully explored since Borer (1984). We have proposed here that we should also explore the possibility that the rules of interpretation can be subject to variation. In particular, we have argued that the difference concerning wh/focus-movement between Western Bade and English cannot be traced to a property of a functional category and that, therefore, it could plausibly be attributed to
interpretation. Likewise, we have proposed that if a language has different surface positions for focus-phrases and wh-phrases, this could be traced to a property of the interpretive module that interprets them.

The parameter that distinguishes Western Bade from English has been provisionally summarized as in hypothesis 2 (12). Soon we are going to revisit (12) and find that it needs refinement. What we are going to find is that in gapping constructions, Spec,v can be a place where foci and wh-phrases can be interpreted, in English. This will lead us to reconceptualize (12) in terms of soft, ranked rules. But first we have to clarify what gapping is.

6. Gapping

A sentence contains a “gap” if the main verb (and possibly other material) is missing, while two other constituents are left overt. One of the overt constituents is typically (but not necessarily) the subject of the clause (missing material appears in strike-thru):

(18) John reads War and Peace and Peter reads The New York Trilogy.
(19) John does not read War and Peace or Peter reads The New York Trilogy.

We refer to the overt constituents in the second clause as remnants. A remnant must be in a contrastive relation with a constituent in the first clause, which we call the correspondent (more on this in section 7).

It is customary to start a discussion of this phenomenon by referring to Ross’ (1970) seminal article. According to him, the gapped clause is derived from a complete sentence, from which the elements in strike-thru have been deleted. This approach has been adopted in a number of later works (Pesetsky 1982, Kim 1997, Tran 1999, among many others).
However, the work of Oehrle (1987), Siegel (1987) and Johnson (1994, 1997) shows that the Rossian approach has serious problems. Let's look at Oehrle’s evidence. Consider the sentences in (20)

(20)  
   a. Mrs. J. can't live in Boston and Mr. J. in L.A.  
   b. Mrs. J. can't live in Boston and Mr. J. can't live in L.A.  
   c. Mrs. J. can't live in Boston or Mr. J. can't live in L.A.  

As Oehrle explains, if (20a) were derived from (20b), we would expect it to mean [not p & not q]. Instead, it means [not (p & q)], which is equivalent to [not p or not q], that is, (20c). Consider now (21):

(21)  
   a. Mrs. J. can't live in Boston or Mr. J. in L.A.  
   b. Mrs. J. can't live in Boston or Mr. J. can't live in L.A.  
   c. Mrs. J. can't live in Boston and Mr. J. can't live in L.A.  

If (21a) were derived from (21b), it would mean [not p or not q]. Instead, what it means is [not (p or q)], which is equivalent to [not p & not q], that is, (21c).

The moral of the story is that in (20a) and (21a), it is clear that the negative word in the first conjunct takes scope over the second conjunct. Assuming that semantic scope is syntactically determined, it follows that negation in the first conjunct c-commands the second conjunct – a configuration that does not follow from Ross’s approach.

On the basis of this evidence (as well as some constituency data that we skip for space constraints) Johnson has elaborated a theory of gapping in which there is no sentential
coordination + deletion. Instead, we have VP coordination + Across The Board raising of the verb to T. The resulting structure of a gapping construction looks in essence like (22):\(^{12}\)

\begin{figure}[h]
\begin{center}
\begin{tikzpicture}
\begin{scope}[level distance=1cm, level 1/.style={sibling distance=3.5cm}, level 2/.style={sibling distance=2.5cm}, level 3/.style={sibling distance=3cm}]
\node (TP) {TP}
    child {node {John} edge from parent[draw=none]}
    child {node {T'} edge from parent[draw=none]}
    child {node {vP}
        child {node {reads} edge from parent[draw=none]}
        child {node {vP}
            edge from parent[draw=none]}
            child {node {v' Peter} edge from parent[draw=none]}
            child {node {v' the NYT} edge from parent[draw=none]}
            child {node {t} edge from parent[draw=none]}
            child {node {t} edge from parent[draw=none]}
            child {node {W&P} edge from parent[draw=none]}
            child {node {t} edge from parent[draw=none]}
            child {node {t} edge from parent[draw=none]}
        }
        child {node {conj} edge from parent[draw=none]}
    }
\end{scope}
\end{tikzpicture}
\end{center}
\end{figure}

We think this sort of analysis can provide an answer to a very puzzling question that has so far not been addressed. Consider the following Japanese sentence with a gap (taken from Abe and Hoshi 1999):

\(^{12}\) For the time being, we adopt a “naïve” analysis of coordination for simplicity. In section 7 we make our assumptions explicit.
(23) John-ga Bill sosite Mary-ga Susan-nituite hanasita.
   John-NOM Bill and Mary-NOM Susan-about talked
   'Mary talked about Susan and John about Bill'

Abe and Hoshi (1999) take this to be an instance of gapping (and not Right Node Raising), and we follow them in this. Now the question is why the gapped verb is the one in the first conjunct and not the second. Notice that the directionality of anaphoric relations in Japanese discourse is left to right. As we can see in (24), a subject pronoun in the second conjunct can be coreferential with a DP in the first conjunct, but a subject pronoun in the first conjunct can't be coreferential with a DP in the second conjunct:

    John-NOM early left-and he-TOP station-to ran-and went
    'John left early and he went to the station'

b. *Kare-ga hayaku de-te John-wa eki-ni hasit-te itta.
   he-NOM early left-and John-TOP station-to ran-and went
   (Kunio Nishiyama, p.c.)

If gapping is the result of CP-coordination and subsequent deletion, as in the classic Rossian analysis, this difference between Japanese and English is unaccounted for. But if it is the result of VP coordination + ATB movement of the verb to T, the result is exactly what we would expect in a language in which complements are located to the left of heads.\footnote{13}{Obviously, (25) can be suitably translated into Kayne’s (1994) antisymmetry framework, without altering the argument.}

(25) TP
However, Johnson's approach has some problems which he discusses. The first one is case assignment to the second conjunct subject in the absence of an inflectional node. Here, he follows Zoerner (1995) in assuming that the conjunction can be a case assigner. A second problem is how or under what conditions the subject of the first conjunct can raise to T without violating the Coordinate Structure Constraint (CSC) (Ross 1967). To this, Johnson replies that A-movement is not subject to the CSC. Thus, assuming an analysis of ECM constructions in which the subject of the subordinate clause raises to an A-position in the main clause (Chomsky 1993, Postal 1974), it can be seen that the ECM subject in (26) must have raised out of a coordination:

(26) Julie has believed Liz for some time [t to be honest] and [Scott to be entertaining].

We will not try to make further contributions to Johnson's approach here. Instead, we simply retain the idea that Gapping involves vP coordination and not CP coordination.

7. Wh-phrases and focus-phrases in gapping contexts

It has frequently been observed in the literature on gapping that the deleted constituents must be contextually given and that the remnants must occur in a contrastive relation to their correspondents (Kuno 1976:309, Sag 1976:280f, Pesetsky 1982:640ff, Johnson 1994, Kim 1997, Winkler 1997, Hartmann 2000). This contrastivity requirement on gapping is given in (27):
In Gapping the absent elements must be given. The remnants must occur in a contrastive relation to their correspondents.

Evidence of this contrastivity is that gapping sentences are very natural responses to multiple wh-questions:

(28) A: Who bought what?
   B1: JOHN bought APPLES, and MARY bought BANANAS.
   B2: JOHN bought APPLES, and /MARY bought BANANAS.
   B3: John bought APPLES.

In (28B1, B2), the DPs Mary and bananas contrast with John and apples. In (28B3), the simple answer does not require a contrastive reading. If, however, a coordinating conjunction is present, as in the gapped (pair-list) answers, contrastivity results. Thus, we conclude that the remnants of gapping are or can be foci (see fn 1).

Alternatively, the remnants can also be wh-phrases:

(29) a. Bill asked which books we gave to Mary and [VP which records to John].
   b. Bill asked which books we gave to which students and [VP which bones to which dogs].

Prima facie, (29) looks like evidence that gapping does involve CP coordination (Pesetsky 1982). However, appearances are misleading. In the negated version of (29a), negation takes
scope over both conjuncts, as shown in (30a), providing the reading paraphrased in (30b) (see our discussion above of Oehrle's examples):

(30)  

a. Bill asked which books we didn't give to Mary or which records to John.

b. Bill asked which books we didn't give to Mary and which records we didn't give to John.

So now we are confronted with a paradox: wh-phrases in English must go to Spec,C, but in (30) the wh-phrase is trapped within the vP, so the sentence should be ungrammatical, but it is not. The solution to this paradox is to assume that in gapping contexts English is more like Western Bade, in as much as Spec,v can be the final landing site of a wh-phrase because it can be interpreted in that position:

(31)

Let's go back now to the other type of remnant, the one that we have defined as focus. The question now is whether these foci are in situ or have raised vP-internally. Evidence suggests the latter. It has been repeatedly observed in literature that topicalization is possible in

(32)  a. At our house we play poker, at Betsy's house, bridge.
     b. The beans, Harry cooked, and the potatoes, Henry.
     c. During dinner, my father talked to his colleagues from Stuttgart and at lunch time to his boss.

Example (33) shows that topicalization is also possible in negated gapping constructions. Under the observation that gapping of negation is not possible in disjunctions, the parse of (33a) is (33b) and not (33c):

(33)  A: When didn't your father address whom?
     a. During dinner he didn't address his colleagues from Stuttgart or at lunch time his boss.
     b. or at lunch time he addressed his boss, for that matter.
     c. *or at lunch time he didn't address his boss, for that matter.

Notice that the word order in (33a) can't be obtained if the remnant constituents are in situ. This can be seen in sentence (34) (pronounced with unmarked intonation).

(34)  *He didn't address at lunch time his boss.
(34) shows that at least the first remnant in (33a) must have raised. Let's look at another example. An NPI is possible in first position in the second conjunct. This is exemplified in (35A2).

(35) A1: Was your father in a bad mood last night?
    B: Why? Did he do anything strange?
    A2: During dinner he didn't address his colleagues from Stuttgart
        or at any time his boss, for that matter.

Again, word order confirms that the NPI must be topicalized:

(36) *He didn't address at any time his boss.

Incidentally, notice that (35A2) shows again that the negative word of the first conjunct has scope over the second conjunct. Example (37) shows that the NPI "at any time" cannot occur sentence initially in non-gapped sentences.

(37) *At any time my father didn't address his boss. (also bad with inversion)

Thus, (37) can only be grammatical if the NPI has been topicalized within the vP. The NPI in Spec,v can be c-commanded by negation in the first conjunct, but if the NPI had been topicalized to Spec,C, no negative word could c-command it. We conclude that in English Spec,v is a landing site for wh--phrases and foci. Consequently, it must also be a position where INT can be assigned. But only in gapping contexts:
8. Discussion

In section 3, we provisionally concluded that what distinguished English from Western Bade was the following interpretation rule:

\[(38)\]

- \text{conj} \quad \text{vP} \quad \text{wh/focus} \quad \text{v'}
- \text{Su} \quad \text{v'}

\[(39)\] Hypothesis 2: the difference involves interpretive rules.

\begin{itemize}
  \item[a.] Spec,v receives INT in Western Bade.
  \item[b.] Spec,C receives INT in English.
\end{itemize}

However, what we saw in the previous section showed that this conclusion is not entirely correct, since Spec,v can also receive INT in English. The difference between Western Bade and English cannot be a categorical rule like the one in (39), but must be something more nuanced. Apparently, the interpretive component is free to assign INT to the edges of certain projections, but one position is arbitrarily chosen as the unmarked one, and this choice is what is subject to parametric variation. We suggest the following hypothesis:

\[(40)\] UG: (i) Spec,v may receive INT.
(ii) Spec,C may receive INT.

Parameters: a. Spec,v > Spec,C (Western Bade)
             b. Spec,C > Spec,v (English)
Rules (i) and (ii) are both part of UG. In a structure with both a vP and a CP, they are clearly in conflict. So we need a parameter that makes one position preferable. The symbol ‘>’ can mean “is ranked higher than” or “is less marked than”. Notice that this parameter only kicks in if the structure to be evaluated contains both a vP and a CP: if we have a structure with only a vP or CP, rules (i) and (ii) of (40) do not conflict.

Let's suggest a way in which (40) could be developed technically. In order to accomplish this, we need to make some assumptions explicit. First, we need to update our coordinate structures. Let's follow Munn (1993) and take a coordination to be an adjunction structure, as represented in (41):

(41)  XP
    /   \
   /     \ 
XP        ConjP
    |       |
   Conj    YP

Second, we adopt Chomsky's (2000) idea of deriving syntactic representations by phase. According to him, a subnumeration including a transitive v or a C constitutes a phase, a structure that can interface with the interpretive modules. Moreover, a phase is evaluated at the next phase level (except for the root node that exhausts the numeration). It seems plausible that adjunct structures, including ConjP, form phases; arguments in favor of this assumption are that they are opaque to extraction and they can be merged counter-cyclically. An additional assumption of Chomsky (2000) that we adopt is that a [-interpretable] feature is licensed only if it has an effect on output.

14 Uriagereka (1999) has adjunction structures spell-out before merging with the main clause. This seems to us to be an instantiation of the same idea.
Now take wh-movement or focus-movement in English, in an ordinary sentence that includes a vP and a CP. We want v to have [f] so it can attract the wh/focus-phrase to Spec,v. With the wh/focus-phrase in Spec,v, INT may or may not apply. Let's assume it does not apply. The derivation proceeds and now we have a CP. We need the CP to have [f] to attract the wh/focus-phrase to Spec,C. With the wh/focus-phrase in Spec,C, INT may or may not apply. Assume it does. The wh/focus-phrase is interpreted at Spec,C, parameter (40b) is respected and the sentence is acceptable. This is represented in (42). If INT does not apply at C, then the wh/focus-phrase will have to keep moving into the next phase.

(42)  
\[
\begin{align*}
\text{CP} \quad \overset{\approx}{\text{structure conforms to parameter (40b)}}
\end{align*}
\]

\[
\begin{align*}
\text{Spec} \quad \overset{\text{(INT applies here)}}{\text{C'}} \\
\text{C[f]} \quad \text{TP} \\
\text{T} \quad \text{vP} \\
\text{Spec} \quad \text{v'} \\
\text{v[f]}
\end{align*}
\]

Alternatively, let's assume that the wh/focus-phrase is interpreted in Spec,v. This is represented in (43). INT is evaluated at the C phase. In English, assignment of INT to v conflicts with parameter (40b) and the sentence is ungrammatical.

(43)  
\[
\begin{align*}
\text{CP} \quad \overset{\approx}{\text{application of INT to Spec,v is evaluated here. If parameter (40a) then \overset{\approx}{(WB)}. If parameter (40b) then * (English).}}
\end{align*}
\]

\[
\begin{align*}
\text{Spec} \quad \text{C'} \\
\text{C[f]} \quad \text{TP}
\end{align*}
\]
Let's now take Western Bade. v has \([f]\), so it attracts a wh/focus-phrase. INT may or may not apply. Let's assume it applies, as in (43). This is evaluated at the next phase, with C in the structure. Assignment of INT to Spec,v passes parameter (40a). C could also have \([f]\), but this would violate the “have an effect on output” condition because the wh/focus-phrase has already been interpreted; so \([f]\) is not licensed in C.

If INT does not apply at the v phase level in Western Bade, the derivation may proceed and construct a new phase with a C with \([f]\) that attracts a wh/focus-phrase. If INT applies at the C phase, we have a conflict with parameter (40a), and the result is deviant. So INT can't apply at the C phase and the wh/focus-phrase must keep raising.

Let's now take a gapping example in English. Recall that the empirical issue here is that wh/focus-phrases can be interpreted in Spec,v.

We can plausibly assume INT does not apply to the edge of Conj, since we never find sentences like (44):\(^{15}\)

(44) *Bill asked which books I gave to Mary \([\text{Spec,Conj}] \text{ which records } [\text{Conj'} \text{ and to John}]\)

With this in mind, the derivation may proceed as follows: the wh/focus-phrase raises to Spec,v, attracted by \([f]\) in v. INT may or may not apply; let's assume it does. The next phase is closed at the ConjP level. Parameters (40a,b) do not apply because there is no C. Either of the

---

\(^{15}\) On the other hand, Conj may have \([f]\), given ATB extraction. Obviously, this goes beyond the limits of this project, but see Nunes and Uriagereka (2000) for relevant discussion in the context of parasitic gaps.
UG rules (40i) and (40ii) may apply without conflict. In this case, since ConjP dominates a vP, rule (40i) can apply. Thus the expression is grammatical, as shown in (45). Assume INT does not apply to the wh/focus-phrase in Spec,v. Since the next phase does not include a C – indeed, it does not include an element that allows for INT to apply – ungrammaticality results.

\[
(45) \quad \text{ConjP} \quad \xrightarrow{\text{application of INT to Spec,v is evaluated here. Parameters (40a,b) are inapplicable. (40i) can apply without conflict.}}
\]

\[
\begin{array}{c}
\text{Spec} \\
\text{v'} \\
\text{v[f]}
\end{array}
\]

David Pesetsky (p.c.) points out a potential problem for our approach. Assume a structure like that in (46), both vPs being strong phases:

\[
(46) \quad \text{vP} \\
\begin{array}{c}
\text{v} \\
\text{VP} \\
\text{V} \\
\text{vP}
\end{array}
\]

In this structure, if both vPs are strong phases, then it should be possible to have a wh/focus phrase in the lower Spec,v, according to the logic of our analysis. The question is whether structures like that of (46) do exist. As a matter of fact, López (2001 a,b) has argued that this is precisely the structure of Romance causatives, like the one in (47):

\[
(47) \quad \text{Le hizo a Juan jugar al fútbol.} \\
\text{Cl.DAT made DAT Juan play to.the soccer} \\
\text{‘She made Juan play soccer’}
\]
According to López’s proposals, *a Juan jugar al fútbol* would be a vP small clause directly selected by the causative verb.

A wh/focus-word in the spec of the lower v is indeed ungrammatical:

\[(48) \quad \text{*Le hizo a Juan qué jugar.}\]

\[\text{Cl.DAT made DAT Juan what play}\]

However, causative verbs in Spanish do not accept a wh/focus-phrase in the complement even when the latter is clearly a CP:

\[(49) \begin{align*}
\text{a.}& \quad \text{Le hizo que trajera dos botellas de vino.} \\
\text{DAT.CL made that bring.SUBJ two bottles of wine} \\
\text{‘She made him bring two bottles of wine’}
\end{align*}\]

\[\text{b. *Le hizo que cuándo trajera dos botellas de vino}\]

\[\text{DAT.CL made that when bring.SUBJ two bottles of wine}\]

Therefore, the ungrammaticality of both (48) and (49b) can be accounted for in terms of selection: causative verbs do not select for interrogative complements. It would be interesting to see what would happen with a verb that could select for a vP and could also have interrogative complements. For the time being, our analysis remains unfalsified by structures like (46).

9. Conclusion

In this paper, we have made two claims: (i) syntactic variation across languages may involve the interpretive modules, (ii) the interpretive rules are universal but ranked; variation comes from the alternative rankings of those rules.

(40) has the flavor of an optimality type of approach (Prince and Smolensky 1993). Following Pesetsky (1998), we claim that ranked constraints play a role in the mapping from $C_{HL}$ to the interpretive systems, while $C_{HL}$ itself is invariant.
Bibliography


Hartmann, K. 2001. "Background Matching in Elliptical Coordination". In this volume.


Johnson, K. 1997. *In search of the English middle field*. [Ms.] University of Massachusetts, Amherst.


Ross, J. R. 1970. "Gapping and the order of constituents". In *Progress in linguistics*, M.
Bierwisch and K. Heidolph (eds), 249-259. The Hague: Mouton
[Arbeitspapiere des Sonderforschungsbereichs 340: Sprachtheoretische Grundlagen für die Computerlinguistik, Bericht Nr. 121]. Universität Tübingen.