THE OXFORD HANDBOOK OF

INFORMATION

STRUCTURE

Edited by

CAROLINE FÉRY

and

SHINICHIRO ISHIHARA

OXFORD
UNIVERSITY PRESS

CONTENTS

The research reported by Nava and Zubizarreta (2010) and Zubizarreta and Nava (2011) on the production of L1 Spanish/L2 English speakers point to the same conclusion. It was shown in that study that it was significantly easier for L2 speakers to produce sentence-internal 'marked' NS (in both narrow-focus cases such as (23) and wide-focus cases such as (25)) than in sentence-internal 'unmarked' NS (i.e. NS on the subject in eventive *SV* structures in wide-focus contexts, discussed in Section 9.2.1). The authors conclude that the Spanish grammar is compatible with *A-deaccenting & NS-Shift* and that acquiring the L2 mechanisms of *A-deaccenting & NS-Shift* do not require 'outcompeting' any algorithm of the L1 grammar; therefore, Spanish speakers can readily incorporate this mechanism into their L2 English grammar. On the other hand, native Spanish speakers have a very hard time acquiring the 'unmarked' prosodic patterns with non-sentence final NS generated by the Germanic NSR. In the studies discussed in this chapter, few L2 speakers produced the Germanic stress pattern for eventive *SV* intransitives (and none to a native-extent). We also expect 'marked' stress patterns to be more easily affected by language contact.

The same reasoning would apply under the alternative view (Féry and Kügler 2008; Féry 2011), where the 'marked' patterns are generated by directly manipulating the scaling of pitch accents. For Spanish native speakers learning German or English as a second language, the latter (discourse-dependent) mechanism would be easier to acquire than the grammatically encapsulated phrasing rule in (10a).

9.5 SUMMARY

As mentioned at the beginning of this chapter, it is now well-established that prominence relations within a sentence are intimately connected to information structure. We have presented and compared some of the recent proposals in light of empirical data, in particular data pertaining to NS variability in Germanic. Whatever the ultimate status of NS in the grammar (whether it is a by-product of prosodic phrasing or has a privileged status in the computation of metrical structure), a successful system needs to account for variable NS placement in certain Germanic structures and for the rigid nature of NS placement in the Romance languages (of the Spanish variety). Recent research on dialectal variability in Spanish and on the speech of L1 Spanish/L2 English speakers supports the view that 'unmarked' (wide-focus) patterns are generated by a different rule from the one that generates the 'marked' (narrow-focus) patterns (e.g. the former by the NSR and the latter via *A-deaccenting & NS-Shift*). The further issue of whether narrow *informational*-focus and narrow *contrastive*-focus are prosodically distinct (the former identified by the NS and the latter by emphatic accent) is yet another question, touched upon very briefly in this chapter and still a topic of current debate.

FOCUS PROJECTION THEORIES

KARLOS ARREGI

10.1 INTRODUCTION

IN languages that mark focus via prosodic prominence, a sentence with a prosodic peak on a given word is often compatible with more than one focus reading.[1] For instance, the sentence *Mary killed Bill* with prosodic prominence on *Bill* over all other words in the sentence can be understood with focus on *Bill*, but this is also the prosodic profile corresponding to a sentence-wide focus reading. This, however, is not the case for *Mary* in this sentence: prosodic prominence on this constituent is only compatible with focus restricted to *Mary*. This phenomenon, and its constraints in different languages, is typically referred to in the literature as 'focus projection', and has received quite a bit of attention. In this chapter, I compare two types of accounts of focus projection, which I term *Default Prosody* and *F-projection* approaches. Under the former approach, constraints on focus projection are the consequence of default prosodic prominence rules that are independent of focus or any other IS-related concept. The only principle directly relating focus and prosody is Focus Prominence, a very general constraint requiring the focus to be prominent. On the other hand, the F-projection approach assumes a more direct relation between prosody and (syntactic) focus-marking, and default prosody rules (whether they exist or not) play no role in accounting for focus projection facts.

This chapter is organized as follows. Section 10.2 reviews the basic facts, and Sections 10.3 and 10.4 summarize specific implementations of the Default Prosody and F-projection approaches, respectively. The two approaches are further compared in Section 10.5, which provides crucial evidence from the literature in favor of the Default Prosody approach. The review of the literature concludes in Section 10.6, which provides a brief summary of other aspects of theories of focus projection not covered in

previous sections. Finally, Section 10.7 discusses potential counterevidence to Focus Prominence from focused unaccented words in Northern Biscayan Basque, and I propose a small modification of the principle in order to accommodate the facts.

Throughout this chapter, I give only very basic illustration of focus projection and related facts, concentrating on English, and to a lesser extent, on other West Germanic languages and Basque. The interested reader should consult the works cited in the chapter to obtain a more accurate and comprehensive picture of the empirical domain, as well as of the different analyses that have been proposed in the literature.

10.2 Focus projection: The basic facts

Focus projection[2] is the expression used to refer to the fact that, in several languages, phonological marking of focus (prosodic prominence) on a word is compatible with semantic focus on different constituents containing that word.[3] The phenomenon, which was described for English in Halliday (1967: 207–208) and was first brought to the attention of generative linguists in Chomsky (1971), can be illustrated by the following English sentence, where small capitals indicate prosodic prominence:[4]

(1)   Mary killed BILL.

Prominence on the direct object *Bill* in this sentence is compatible with focus on the direct object itself, but also on the containing VP *killed Bill*[5] as well as the whole sentence.[6] This ambiguity can be verified in several ways, for instance, by checking the felicity of uttering (1) as an answer to the following questions:

(2)   a. Who did Mary kill?
       b. What did Mary do?
       c. What happened?

The fact that (1) is a congruent answer to all three questions shows that it can be interpreted with focus on the direct object (as an answer to (2a)), the VP (2b), or the entire

---

[2] The use of this expression to refer to the phenomenon described below is due to Höhle (1982: 99).

[3] For the purposes of this chapter, 'focus' is understood as denotation focus in Krifka's (2008) sense.

[4] For the moment, I intentionally remain vague as to what exactly 'prosodic prominence' means, since theories of focus projection differ on this point. See Sections 10.3, 10.4 and 10.6 for details.

[5] The present discussion abstracts away from details of clause structure that seem ultimately not to be relevant to these descriptive remarks. For instance, the constituent referred to as 'VP' here may be larger, under the assumption that V moves out of VP. What is important is that there be a constituent whose only overt subconstituents are the verb and the direct object.

[6] Note that this description of (1) is compatible with the existence of phonetic differences correlating with the different focus readings, and, indeed, both Halliday (1967) and Chomsky (1971) note that those differences exist. See Gussenhoven (1983b), Breen et al. (2010), and references cited there, for relevant experimental literature showing that these phonetic differences are real.

---

sentence (2c).[7] We can thus say that focus can project from the minimal constituent containing prosodic prominence to other constituents dominating it.

Although much of the literature concentrates on the facts of English and other Germanic languages, the basic phenomenon is not restricted to this family. For example, the following sentence in Basque[8] can have different focus readings (see A. Elordieta 2001: 130–134 for relevant examples and discussion):

(3)   Basque
       Mirenek   JON   hil   zuen.
       Miren.ERG   Jon.ABS   kill.ABS   AUX:PST

       'Miren killed Jon.'

As in English, the claim that the sentence has several focus readings can be diagnosed by the fact that it can be an answer to the following questions:

(4)   Basque
       a.   Nor   hil   zuen   Mirenek?
              who.ABS   kill.PRF   AUX:PST   Miren.ERG

              'Who did Miren kill?'

       b.   Zer   egin   zuen   Mirenek?
              what.ABS   do.PRF   AUX:PST   Miren.ERG

              'What did Miren do?'

       c.   Zer   gertatu   zen?
              what.ABS   happen.PRF AUX:PST

              'What happened?'

Thus, (3) can be understood with focus on the prosodically prominent direct object *Jon*, but also on other constituents containing it, namely the VP *Jon hil* and the whole sentence.

Observations of this type have led to the following hypothesis (see Sections 10.3 and 10.4 for specific implementations):

(5)   *Focus Prominence*[9]
       The focused constituent in a certain domain (typically, the sentence), must contain some type of prosodic peak.

---

[7] See Krifka (2008) and Rooth (this volume), for discussion of the role that focus plays in determining question–answer congruency under the notion of focus assumed here.

[8] Unless otherwise noted, Basque examples are from Batua, the standard dialect.

[9] The first formulation of a principle along these lines in the generative literature is in Chomsky (1971: 201).

This derives the facts above. In the case of (1), since *Bill* is dominated by (at least) three different nodes (the direct object, the VP, and the sentence), prosodic prominence on this word is compatible with (at least) three different focus readings.

Several different theories of focus projection have been proposed in the literature. The main general observation that these theories attempt to account for is the fact that focus projection is not as unrestricted as suggested by the data discussed above. For instance, although focus can project from the direct object to the VP or the entire sentence in (1), focus projection from other constituents is severely limited. For instance, consider the following variation on (1) in which prosodic prominence is on *Mary* instead of *Bill*:

(6) MARY killed Bill.

Given Focus Prominence, this sentence is expected to not have an object-focus or VP-focus reading, since neither constituent contains *Mary*. Indeed, it cannot be an answer to (2a) or (2b). Similarly, (1) cannot be understood with focus on the subject (i.e. it cannot be an answer to the subject wh-question below), since this constituent does not contain *Bill*. Furthermore, the principle also correctly predicts the fact that (6) has a subject-focus reading (since the subject contains *Mary*) and can thus be an answer to *Who killed Bill?* However, a theory of focus projection that has no principle other than (5) wrongly predicts that (6) can be understood with focus on the entire sentence in an out of the blue context, since, trivially, the sentence contains *Mary*.

Two main approaches have been adopted in the literature with the objective of accounting for the observed facts of focus projection. Both types of analyses complement Focus Prominence with other principles and rules that further restrict the possible relation between prosodic peaks and focused constitutents. In the *Default Prosody* approach, constraints on focus projection are the result of default prosodic prominence rules that are independent of focus. Under this view, Focus Prominence is the only principle that directly relates focus and prosody. This contrasts with the *F-projection* approach, in which focus and prosodic prominence are related in a more direct way by a set of rules that can license focus on different constituents of a sentence given a specific distribution of prosodic peaks in the sentence (i.e. the rules license 'projection' of focus from a word with a prosodic peak to constituents containing that word). Note that in this chapter I make a terminological distinction between 'focus projection', namely, the fact that a particular sentence is compatible with several focus readings, and 'F-projection', a particular type of analysis of this fact. This important terminological distinction is often not made in the literature reviewed below.

These two approaches to focus projection are summarized and compared in the next three sections, where it is argued that the Default Prosody approach provides a more satisfactory account of the facts.

10.3 THE DEFAULT PROSODY APPROACH

In the Default Prosody approach, focus projection is accounted for in terms of Focus Prominence and default prominence rules. In this section, I discuss the analysis of focus projection in Jackendoff (1972: ch. 6), which provides the first explicit analysis of the facts under this approach. For reasons of space, I limit the main discussion to Jackendoff's account as a representative of the Default Prosody approach, and only briefly summarize the main alternatives in Section 10.6.

Jackendoff's analysis is based on Focus Prominence, as defined in (7), and the Default Prominence hypothesis shown in (8):[10]

(7) *Focus Prominence*
  The focused constituent in a sentence is the prosodically most prominent element in that sentence.

(8) *Default Prominence*
  Within a focused constituent, prosodic prominence is determined by default principles of prosody that are independent of focus.

Under this approach, other than by (7), focus does not determine the prosodic shape of a sentence. Specifically, once the effects of Focus Prominence are taken into account, the relative prosodic prominence of any two constituents in a sentence is determined by principles of default prominence that are independent of focus.

The analysis is also based on two further assumptions:

(9) The notion of prosodic prominence relevant to focus is stress, that is, Focus Prominence and Default Prominence are stated in terms of levels of stress.

(10) Default prominence in English is determined by the cyclic Nuclear Stress Rule in Chomsky and Halle (1968), according to which the prosodically most prominent daughter of a constituent is the rightmost one.

Consider again the sentence *Mary killed Bill*. Recall that the basic facts of focus projection are that, while prominence on the direct object *Bill* is compatible with focus on the direct object, the VP, or the entire sentence, prominence on the subject *Mary* is only compatible with focus on the subject. In Jackendoff's analysis, the sentence can have

---

[10] Jackendoff (1972: 237) states these two hypotheses in terms of a single condition that also subsumes (9) below: 'If a phrase P is chosen as the focus of a sentence S, the highest stress in S will be on the syllable of P that is assigned highest stress by the regular stress rules.' For his formal implementation, see Jackendoff (1972: 241–242).

all of the following syntactic representations, each of which corresponds to a different focus reading:

(11)   a.   [$_s$ Mary$_F$ [$_{VP}$ killed Bill]]
       b.   [$_s$ Mary [$_{VP}$ killed Bill$_F$]]
       c.   [$_s$ Mary [$_{VP}$ killed Bill]]$_F$
       d.   [$_s$ Mary [$_{VP}$ killed Bill]$_F$]

In each of these structures, a constituent is *F-marked* (i.e. it is assigned a feature F). Semantically, this means that the F-marked constituent is focused (Jackendoff 1972: 245–247; see Rooth 1992 for a widely assumed formalization of the relation between F and the semantics of focus). The principles in (7)–(10) ensure that the correct word in the sentence is assigned prosodic prominence. If the subject is focused (i.e. F-marked as in (11a)), Focus Prominence (7) ensures that prominence (nuclear stress) is on *Mary*, whereas if the object is focused (11b), this principle ensures that prominence is on *Bill*. The role played by the principles determining default prominence (8)–(10) in these cases is trivial, since the F-marked constituents in these cases only contain one (overt) word.

The adoption of (8)–(10) (especially Default Prominence) is crucial for accounting for what we can informally refer to as the projection examples, namely those in which the F-marked constituent contains more than one word. In particular, sentence-wide focus (11c) results on prominence on the direct object *Bill*: Focus Prominence would trivially be satisfied by assigning prominence to any word, but Default Prominence and (10) determine that prominence is on the rightmost word, that is *Bill*. The role of Default Prominence can also be observed in the derivation of the VP-focus reading: Focus Prominence ensures that the VP is more prominent that the subject, but within the VP, the object is assigned prominence because it contains the last word in the VP. Focus Prominence alone cannot derive this, since no particular constituent within the VP is F-marked (i.e. informationally more salient than any other constituent within VP). Therefore, Default Prosody (together with the other elements in the analysis) correctly predicts that prominence on the object, but not the subject (or the verb), is compatible with a focus on VP and the entire sentence.

This analysis can easily be extended to account for focus projection facts in other languages, with the caveat that other languages might differ from English in their rules of default prominence. For instance, default prominence in sentences in Basque is not on the last word of the sentence, but on the constituent immediately preceding the main verb.[11] Thus, F-marking on the direct object, the VP, or the entire sentence in (3) above will result in prominence on the direct object, since the latter immediately precedes the main verb in all the former constituents.[12]

---

[11] See Hualde et al. (1994), A. Elordieta (2001: 130–143, 2002), Arregi (2002: ch. 4, 2006), and G. Elordieta (2003) for more detailed description and analysis of the facts in different dialects.
[12] This also correctly predicts that F-marking on the subject in (3) is not possible, since the subject is not immediately preverbal in this sentence (Basque is an SOV language), and unlike English and

Importantly, this theory accounts for focus projection facts without rules or principles that directly determine focus projection: the fact that (transitive) VP focus in English requires prominence on the object is not derived by 'projecting' the focus from the object to the VP, but is a consequence of default prominence rules (which in English assign prominence to the rightmost constituent, i.e. the object in a transitive VP).

Subsequent literature has challenged most of the components of Jackendoff's analysis, and the following sections provide a critical overview of this literature. Focus Prominence remains essentially unchallenged (with important modifications due to cases where the domain of focus is not an entire sentence, as in Rooth 1992 and Truckenbrodt 1995: ch. 4), but all the other components of the theory have been argued against. In the next two sections, I concentrate on the F-projection approach, whose most interesting feature is that it provides an account of focus projection that is not based on Default Prominence. Section 10.6 provides a brief summary of alternatives to Jackendoff's analysis that differ mostly on the principles that determine default prominence.

10.4 THE F-PROJECTION APPROACH

As mentioned above, the defining feature of the F-projection approach is that it accounts for focus projection facts in terms of principles and/or rules that license focus on different constituents in a sentence given a specific distribution of prosodic peaks in the sentence (Selkirk 1984, 1995; von Stechow and Uhmann 1986; Rochemont 1986). Under this approach, default (i.e. IS-independent) rules of prominence play no role in accounting for focus projection. In this section, I provide an overview of Selkirk (1995) as representative of this type of approach.

Part of the motivation for Selkirk's analysis (and more generally, for the F-projection approach) comes from cases of so-called default accent, first discussed at length in Ladd (1980: ch. 4). Consider the following congruent question–answer pair, in which the focus in the answer is a VP containing an element that is co-referent with an element in the question (*Bill*):

(12)   a.   What did Bill's mother do?
       b.   She KILLED Bill/him.

---

other Germanic languages, sentence prominence cannot be shifted to a different constituent. As a result, a focused argument or modifier must surface to the immediate left of the verb, which may result in deviations from the default SOV order (Etxepare and Ortiz de Urbina 2003). In addition, these alternative orders impose tighter restrictions on focus projection. See A. Elordieta (2001: 138–142) and Arregi (2002: 189–199) for specific analyses of these facts within the Default Prosody approach.

As an answer to (12a), the prominence in (12b) must be on the verb, not the object. In Jackendoff's theory, this is predicted to be possible only if the context requires a focus on the verb. However, the context in this case (i.e. the wh-question) determines that the focus in (12b) is the entire VP, not just its head. This contrasts with the following question–answer pair (assuming that no mention of *Bill* has been made in the conversation up to this point):

(13) a. What did Mary do?
      b. She killed Bill.

In this case, the prominence in the answer is on the object, as expected for VP focus. The crucial difference is that, by mentioning Bill, the question in (12a) makes the object in (12b) *given*,[13] which is not the case in (13).

Selkirk uses examples of this type to justify a theory that has the following components. Relying on the fact that a prosodically prominent word has a pitch accent, Selkirk takes the latter (and not stress) to be the primary exponent of focus.[14] Pitch accents are freely assigned to words in the syntactic structure, and the rest of the analysis ensures that placement of a pitch accent on a given word is paired with the correct semantic interpretation. More specifically, a set of *F-assignment rules* regulates which constituents can be F-marked, given a specific distribution of pitch accents. Unlike the Default Prosody approach, focus projection is directly encoded in the representation of the sentence in terms of the licensing of F-marking, and default prominence plays no role in the analysis. The F-assignment rules are the following (Selkirk 1995: 555):

(14) *Basic F-rule*
      An accented word is F-marked.

(15) *F-projection rules*
      a. Head Projection
         F-marking of the head of a phrase licenses the F-marking of the phrase.

      b. Argument Projection
         F-marking of an internal argument of a head licenses the F-marking of the head.

Note that (15b) makes argument structure an important factor in determining focus projection. This represents another important departure from Jackendoff's analysis (Section 10.3 above), in which focus projection (as encoded by rules determining

default prominence) is not related to argument structure (see Section 10.6 for a brief discussion of this aspect of Selkirk's and others' views on the role of argument structure in focus projection). The implicit asymmetry in (15) between arguments and modifiers (which are not mentioned by the F-projection rules) is due to observations made in Gussenhoven (1983a; see Section 10.5 below for relevant discussion).

A different set of principles relates F-marking to the semantics (and pragmatics) of focus and givenness (Selkirk 1995: 555–556):

(16) a. The focus of a sentence is an unembedded F-marked constituent (i.e. an F-marked constituent not dominated by any other F-marked constituent).
      b. An embedded F-marked constituent is new (i.e. not given).
      c. A non-F-marked constituent is given.

Statement (16a) is the equivalent of the Focus Prominence principle: it requires the focused constituent to be F-marked, and given the F-assignment rules, this consituent must contain a pitch accent. Note that the rules in (16) treat F-marking and non-F-marking in a different way: while the latter always entails givenness, the former only entails newness in F-marked constituents dominated by other F-marked constituents. As discussed below, this asymmetry is crucial in accounting for sentences in which the focused constituent is given.

Consider first (1), in which the direct object has an accent. Given the F-assignment rules, it can have all of the following representations:

(17) a. [$_S$ Mary [$_{VP}$ killed Bill$_F$]]
      b. [$_S$ Mary [$_{VP}$ killed$_F$ Bill$_F$]$_F$]
      c. [$_S$ Mary [$_{VP}$ killed$_F$ Bill$_F$]$_F$]$_F$

In all these representations, accent on the direct object *Bill* licenses F-marking on this constituent (by the Basic F-rule). In the absence of any other F-mark, as in (17a), the interpretive rule (16a) determines that the focus of the sentence is the direct object, as desired. F-marking on the direct object can license F-marking on the verb (by Argument Projection), which in turn licenses F-marking on the VP (by Head Projection), resulting in (17b), in which the VP is the focus (by (16a)) and both the verb and the direct object are new. Head Projection can also license F-marking on the entire sentence,[15] as in (17c), in which case the entire sentence is the focus.

The F-marking on (17b) and (17c) is also compatible with an accented verb, which accounts for the optional presence of an accent on the verb in all-new F-marked transtivie

---

[13] See Rochemont (this volume) for discussion of the notion of givenness. The definition of 'given' and 'givenness' assumed here is from Krifka (2008).

[14] On the relation between pitch accent and stress (including default phrasal stress) in this analysis, see Selkirk (1995: section 2).

[15] This can be derived under the assumption that the verb is the head of the sentence. With respect to this, Selkirk (1995: 556) states that F-marking of the VP licenses F-marking of the entire sentence 'via licensing of the various intervening inflectional heads'. What seems to be implicit here is a principle to the effect that F-marking of the complement of a functional head *h* licenses F-marking of *h*, which may be considered a subcase of Argument Projection.

VPs. This contrasts with the behaviour of the subject *Mary*, for which the absence of F-marking in these cases is correctly predicted to entail that this constituent is given (by (16c)). This contrasts with a sentence in which both the subject and direct object are accented:

(18) $[_s \text{MARY}_F [_{VP} \text{killed}_F \text{BILL}_F]_F]_F$

In this case, the subject is new, since it has an embedded F-mark. The analysis thus correctly predicts that all-new sentences must have an accent on the subject (as well as the direct object).

As shown above, Argument Projection (15b) accounts for the fact that focus can be projected from the direct object to the dominating VP (via the V head). In Selkirk's (1984) original formulation of this rule, F-marking on *any* argument of a head could license F-marking of the head. The observation that Argument Projection must be restricted to *internal* arguments is due to von Stechow and Uhmann (1986: 308), and accounts, for instance, for the fact that prosodic prominence on a transitive subject, as in (6), does not seem to license sentence-wide focus (see Section 10.5 for relevant discussion on this fact).

Importantly, default prominence plays no role in this theory. The fact that under both a VP-focus and a sentence-focus reading, prominence is on the object in a transitive sentence has nothing to do with default prominence rules in English, but with rules that constrain the distribution of F-marks in a sentence. One of the main advantages of this approach over Jackendoff's Default Prosody approach is that it makes more nuanced (and correct) predictions about the relation between the prosodic shape of a sentence and the discourse status of its subconstituents. This is due to its reliance on the distribution of accents (as opposed to nuclear stress), and a more fine-grained theory of the information-theoretic interpretation of F-marking (which takes givenness in addition to focus into account).

A further advantage of the F-projection analysis is that it provides a straightforward account for sentences of the type discussed at the beginning of this section, in which givenness within the focused constituent results in 'shift' of the accent to the head of the constituent. Consider (12), repeated here:

(19)   a. What did Bill's mother do?
       b. She KILLED Bill/him.

The analysis licenses the following F-marking on the answer:[16]

(20) $[_s \text{She} [_{VP} \text{KILLED}_F \text{Bill/him}]_F]$

In this case, the accent on the verb directly licenses F-marking on VP (by Head Projection), which can thus be interpreted as the focus. This shows that no accent on the object is necessary to license focus on the VP. In fact, in this particular context in which

---

[16] Example (19b) is also compatible with F-marking on just the verb, which must therefore be the focus. Thus, (19b) can also be an answer to *What did Bill's mother do to Bill/him?*.

Bill/him is given, accenting the object is not possible, since that would entail F-marking on the object, which by (16b), would have to be interpreted as new.

The analysis also accounts for sentences in which the focus is given, as in the following question–answer pair:

(21)   a. Who did Bill's mother kill?
       b. She killed BILL/HIM.

Given the question, the focus of the answer must be the direct object, which limits F-marking to just this constituent:

(22) $[_s \text{She} [_{VP} \text{killed BILL/HIM}_F]]$

Since (16b) only requires *embedded* F-marked constituents to be new, the focus (i.e. an unembedded F-marked constituent) can be given, as shown by this example.

In summary, Selkirk's analysis differs from Jackendoff's in a number of ways, including the central role played by argument structure in determining focus projection, and the adoption of a more articulated theory of the relation between F-marking and semantic/pragmantic interpretation. In addition, Selkirk's analysis of focus projection does not rely on principles of default prosody. As discussed in the next section, this latter aspect of the theory leads to certain predictions about the interpretation and prosodic prominence of parts of the focused constituent of a sentence that have been shown to be wrong in the later literature. This work thus provides crucial evidence that default prominence plays a central role in accounting for focus projection.

10.5 EVIDENCE FOR THE DEFAULT PROSODY APPROACH

The F-projection approach makes the following strong predictions about focus projection:

(23)   *a. Limited Projection*
           Focus on a phrase can only project from its head or the internal argument(s) of its head.

       b. No All-Given Focus
           At least one subconstituent in a nonterminal focused node must be new.

Jacobs (1988, 1991), Schwarzschild (1999), and Büring (1996, 2006) argue that these predictions are wrong and conclude that focus projection is primarily determined by

principles of default prominence.[17] As discussed below, counterexamples to Limited Projection are relatively simple to produce, but it is not completely clear that No All-Given Focus can be shown to be false. Nevertheless, the argument against Limited Projection is strong enough to justify abandonment of the F-projection approach.

Limited Projection follows straightforwardly from the F-assignment rules in (14)–(15). F-marking of a phrase is only licensed by Head or Argument Projection. Since the Basic F-rule ultimately grounds F-marking on accent, it follows that either the head or an internal argument of the head must contain an accent. In other words, focus pojection cannot proceed from any subconstituent that is not a head or an internal argument. The following question–answer pair provides the first counterexample to Limited Projection (from Büring 2006: (13), attributed to Büring 1996):

(24) a. I know that John drove Mary's red convertible. But what did Bill drive?
      b. He drove her BLUE convertible.

The adjective is the only accented word, which is therefore F-marked by the Basic F-rule. Since it is a modifier (not an argument) of the NP object it is contained in, no F-projection is allowed to any other constituent, including the dominating NP. The F-assignment rules can thus only license the following:

(25) He drove [NP her [AP BLUE]F convertible]

However, the question requires focus on the NP, which wrongly predicts the answer to be unacceptable. What seems to be the required F-marking on the answer given the question is the following:

(26) He drove [NP her [AP BLUE]F convertible]F

This requires projection from a modifier, which is not allowed by the F-projection rules. The following is a another counterexample to Limited Projection (from Büring 2006: (17)):

(27) a. Why did Helen buy bananas?
      b. Because JOHN bought bananas.
      c. [S because [NP JOHN]F bought bananas]

The F-assignment rules do not allow projection from the transitive subject to the sentence in (27b), as shown in (27c). Since the question requires focus on the entire sentence,

---

[17] Due to space limitations, I cannot offer an overview of all the arguments in the literature against the F-projection approach, and limit myself to those related to the predictions in (23). Other arguments can be found in Wagner (2005: 285–303), Büring (2006: section 4), and Breen et al. (2010: 1092).

the answer is wrongly predicted to be infelicitous.[18] See Schwarzschild (1999: 167–169) and Büring (2006: section 3) for related counterexamples.

The prediction No All-Given Focus (23b) is a bit more involved. First, a focused element is an F-marked constituent not dominated by any other F-marked constituent, by (16a). Second, according to the F-assignment rules (14)–(15), this F-marked constituent must contain at least one F-marked subconstituent (unless the F-marked constituent is a terminal node, in which case F is licensed directly by the Basic F-rule (14)). Since this subconstituent is an embedded F-marked node (i.e. it is dominated by the focused node), it must be new, by (16b). Thus, a (nonterminal) focused node must contain at least one part that is new.

Counterevidence to No All-Given Focus is discussed by both Schwarzschild (1999: 171–173) and Büring (2006). The following is a relevant question–answer pair from Büring (2006: section 6):

(28) a. What did Sue do when you called Bill's sister?
      b. Sue called BILL.

The question requires focus on the VP in the answer, but both elements (the verb and the direct object) in this VP are given:

(29) Sue [VP called BILL]F

Although the direct object is accented, it cannot be F-marked: that would make it an embedded F-marked constituent, hence new. However, for reasons given in Büring (2006: section 6), it is not completely clear that the context in (28a) does not require F-marking on *Bill* in (28b) (despite its being given), due to the fact that *called Bill's sister* in (28a) contrasts with *called Bill* in (28b). Hence, the argument against F-projection based on No All-Given Focus is not conclusive.

To summarize so far, it looks like F-assignment to phrasal nodes is unconstrained: it can be licensed by any F-marked subconstituent, and, in fact, if conclusive arguments against No-All Given Focus can be found, it might even be possible to license it directly, without any embedded F-marking. Although the predictions are stated in terms of Selkirk's (1995) specific implementation of F-projection, this criticism of the approach is more general, and independent, for instance, of the central role that argument structure plays in Selkirk's analysis, since the counterexamples discussed above provide evidence that there need not be any special relation between F-marking in a phrase and a constituent in it, however that relation is defined.

As a consequence, Schwarzschild and Büring argue for a Default Prosody approach, namely one that assumes both Focus Prominence, which requires the focus to be prominent, and Default Prosody, which assigns prosodic prominence in a phrase

---

[18] The observation that focus can project from a transitive subject (in German) is due to Jacobs (1988: 132; see also Jacobs 1991: 20–21).

independently of focus. This is, of course, not to say that these and other authors adopt the same analysis as Jackendoff (summarized in Section 10.3). In particular, one of the main insights of F-projection approaches is that givenness is an important factor in determining the relation between prosody and semantic/pragmatic interpretation, and current Default Prosody approaches to focus projection take givenness into account in some way or another (i.a. Neeleman and Reinhart 1998; Zubizarreta 1998; Schwarzschild 1999; Samek-Lodovici 2005; Wagner 2005; Büring 2006; Féry and Samek-Lodovici 2006; Reinhart 2006). Another aspect in which versions of Default Prosody differ from Jackendoff's (and from each other) is what exactly constrains default prominence (hence, indirectly, focus projection), which is the main topic of the next section.

10.6 OTHER ASPECTS OF THE THEORY OF FOCUS PROJECTION

As summarized in the previous section, the literature has reached a consensus with respect to what kinds of principles govern focus projection. Specifically, it seems that both Focus Prominence and Default Prominence are necessary components of any successful account. Where the authors disagree is on the specifics of Default Prominence, that is, on the question of what syntactic and/or semantic aspects of an expression determine the patterns of default prosodic prominence within that expression. This section summarizes and compares the different approaches to Default Prominence present in the literature. Since the questions addressed here are mostly not about focus projection per se, but about patterns of default prominence, the discussion is brief, and the interested reader is referred to the work cited in this section, as well as Zubizarreta (this volume).

One of the core cases of focus projection and default prominence discussed throughout this chapter has to do with transitive sentences in which both the verb and the object are included in the focus, for instance, in VP-focus cases, as in the following question–answer pair:

(30) a. What did Mary do?
      b. Mary/she killed BILL.

The relevant generalization that needs to be captured is that the direct object is more prominent than the verb. As was shown in Section 10.3, Jackendoff's Default Prosody analysis accounts for this in terms of Chomsky and Halle's (1968) cyclic Nuclear Stress Rule, which is based on linear order: the object is more prominent than the verb because the former follows the latter. This word-order-based approach to default prominence was adopted in a number of works, including Liberman and Prince (1977), Ladd (1980), Culicover and Rochemont (1983), and Halle and Vergnaud (1987).

Starting with Schmerling (1976), a number of authors have criticized this approach to default prominence, based on both English and other languages. For instance, it cannot

account for unaccusative sentences, where the subject is typically more prominent than the verb:

(31) JOHN died.   (Schmerling 1976: 81)

Moreover, in Germanic OV languages, the object is more prominent than the verb, even though the latter is rightmost in the VP:

(32) German
      weil   ich   HANS   sah
      because   I   Hans   saw

      'because I saw Hans'   (Schmerling 1976: 84)

Based on this and related evidence, a number of accounts have been proposed in which principles of default prominence make direct reference to argument structure, including Schmerling (1976), Gussenhoven (1983a), Jacobs (1988, 1991), Zubizarreta (1998), Schwarzschild (1999), Büring and Gutiérrez-Bravo (2001), and Büring (2006, 2012). The basic idea in this approach is that the overarching generalization in these cases is that the internal argument of a head (e.g. the subject of an unaccusative verb, or the direct object of a transitive verb) is more prominent than the head.[19]

With a similar objective of accounting for cross-linguistic generalizations involving default prominence, Cinque (1993) proposes that the crucial notion involved is syntactic depth of embedding, not argument structure. More specifically, Cinque proposes a very minimal Nuclear Stress Rule that, by applying cyclically to successively larger constituents, derives prosodic prominence (stress) on the most deeply embedded constituent in the sentence. In the Germanic transitive VP examples discussed above, relying on the fact that direct objects (more generally, complements) are phrasal, some word in the direct object is more deeply embedded than the verb within the VP, and thus is assigned prominence over the verb. Other syntax-centred accounts based on similar ideas include Zubizarreta (1998, whose analysis also takes argument structure into account) and Arregi (2002). A somewhat different type of syntax-centred approach to default prominence, based on cyclic phase-by-phase computation, can be found in Legate (2003), Kahnemuyipour (2004, 2009), Adger (2007), and Kratzer and Selkirk (2007), who develop ideas originally due to Bresnan (1971).

An important variant of the Default Prosody approach is defended in Neeleman and Reinhart (1998), Szendrői (2001, 2003), and Reinhart (2006: ch. 3).[20] In this version of the

---

[19] Selkirk (1984, 1995), von Stechow and Uhmann (1986), and Rochemont (1986) can also be considered to be accounts along these lines, but, as discussed in Section 10.4 above, these works adopt an F-projection approach in which argument structure is relevant in determining F-projection, rather than default prominence.

[20] The approach to focus projection adopted in Chomsky (1971) also falls within this variant of the Default Prosody approach.

approach, the main factor determining focus projection is Default Prominence, but the relation between prosodic prominence and focus is not mediated by syntactic F-marking. Rather, the Focus Prominence principle assumed in this analysis directly relates semantic focus to prosodic prominence in the sentence. For instance, the principle in Neeleman and Reinhart (1998) states that the focus set of a sentence consists of the constituents containing the main stress in the sentence. This means that several constituents can be the focus in a given sentence, but focus is not itself directly encoded in the syntax. Rather, discourse conditions determine which is the actual focus in the context the sentence is uttered.

Finally, another aspect in which analyses of default prominence can differ has to do with the type of structure over which prominence is determined. In most of the works cited above, in addition to Truckenbrodt (1995), Samek-Lodovici (2005), and Féry (2011), prominence is determined on the basis of prosodic structure, a structural representation of sentences that is built on—but which is independent of—their syntactic structure. This follows a long-standing tradition in phonology according to which the relation between syntax and phonology is mediated by prosodic structure. On the other hand, the syntax-centred accounts in Cinque (1993), Zubizarreta (1998), Arregi (2002), and Kahnemuyipour (2004, 2009) make direct reference to syntax, without the mediating role of prosodic structure.

10.7 Unaccentable elements and the status of the Focus Prominence principle

Despite the variety of approaches to focus projection discussed above, the principle of Focus Prominence, which requires the focused constituent to be prosodically prominent, remains essentially unchallenged. Data from Northern Biscayan Basque (NBB)[21] prove to be problematic for this principle. The basic facts are discussed for the variety of Lekeitio in Hualde et al. (1994) (see also A. Elordieta 2002, G. Elordieta 2003, 2007, as well as Arregi 2002, 2006 for the variety of Ondarru). As illustrated below, many words in NBB are unaccentable in certain syntactic positions, even when interpreted as focused. This provides prima facie counterevidence to Focus Prominence, as these words can be (semantically) focused even if they are not prosodically prominent. In this final part of this chapter, I give a brief description of the relevant NBB facts, and propose a modification of Focus Prominence that can account for the data.

In NBB, some words are lexically accented and others are not. The former always surface with a pitch accent (H*+L) on some syllable,[22] and the latter only surface with a pitch accent (also H*+L) assigned at the phrase level in a specific syntactic position described below. For instance, ergative plural definite *lagúnak* 'friends' is lexically accented and thus always carries an accent on its penultimate syllable. On the other hand, its singular counterpart *lagunak* is not lexically accented, but can contain a phrasal accent when it surfaces in a specific syntactic position, namely when it is contained in a phrase immediately preceding the verb, which, as discussed more generally for Basque in Sections 10.2 and 10.3 above, is the prosodically most prominent phrase in the sentence. Within this phrase, the accent surfaces on the last syllable (in some varieties the phrasal accent is on the penultimate syllable). A lexically unaccented word can thus have an accent and carry prosodic prominence in a very limited set of contexts: it has to be the word containing the last (penultimate in some varieties) syllable in a phrase immediately preceding the verb. This is illustrated in the following sentence:

(33) Lekeitio Basque
      Neure   lagunák   ekarri   dau.
      my   friend.SG.ERG brought   AUX:PRS

      'My friend brought it.'   (Hualde et al. 1994: 62)

The immediately preverbal subject *neure lagunák* has a syntactically determined phrasal accent that falls on the last syllable of the phrase. Both *neure* 'my' and ergative singular *lagunak* 'friend' are lexically unaccented, hence the only accent that is possible in this phrase is the phrasal accent on *lagunak*, which happens to contain the last syllable in this phrase.

Furthermore, the phrase containing that accent must also contain the focus of the sentence, which follows from Focus Prominence, under the natural assumption that the phrasal accent makes the accented phrase prosodically prominent (see the discussion of Basque in Sections 10.2 and 10.3). However, the process that assigns this accent to the preverbal phrase treats this phrase as unanalysable prosodically,[23] and can only place the accent on the last syllable of the phrase, which leads to clear violations of Focus Prominence. For instance, (33) can be uttered felicitously in a context requiring a focus on *neure* 'my' (e.g. with the continuation *es seuriak* 'not yours'; see Hualde et al. 1994: 62). Even in this case, the phrasal accent must be on the last syllable of the phrase immediately preceding the verb, and must thus be assigned to the last word in this phrase. Under no circumstance can the phrasal accent be shifted to the first word (*neuré lagunak*). This, however, does not prevent the first word *neure* from being interpreted as focused (contexts forcing focus on the last word *lagunák* or the entire phrase are of course also

---

[21] The label 'Northern Biscayan Basque' is used in the literature on Basque accentuation (e.g. Hualde 1999, 2003) to refer to the group of varieties of Basque that have pitch-accent systems. This accent-based grouping does not correspond to standard dialectal groupings based on other criteria (i.a. Zuazo 2013).

[22] The specific placement of the accent within the word is subject to some variation. See references cited above.

[23] The phrasal domain the accent is assigned to can be quite large, e.g. embedded adjunct clauses, or DPs containing relative clauses. See Arregi (2006) for an analysis of these facts.

possible). Thus, (33) has a reading in which *neure* is focused, even though this word does not contain an accent, in clear violation of Focus Prominence.[24]

Note, however, that some version of Focus Prominence must be in play in NBB. If a word is focused, it must be contained in the phrase that contains a phrasal accent, even if the word itself is not assigned the accent. In (33), a focus on *neure* is only possible if it is contained in the phrase immediately preceding the verb; for instance, placing an overt direct object between the subject *neure lagunak* and the verb in (33) makes a focus on *neure* (or any other element in the subject) impossible. Although Focus Prominence as standardly understood is violated, something like this principle ensures that the focused constituent is in the correct syntactic position.

Let us assume, following the discussion above, that the preverbal phrase is unanalysable prosodically, so that any of its subconstituents are in effect prosodically invisible. Then, the following modification to Focus Prominence, adapted from Arregi (2002: 172–175), accounts for the NBB facts:

(34) The minimal prosodically visible constituent containing the focused constituent in the sentence must contain a prosodic peak.

By restricting prosodic peaks to prosodically visible constituents, this reformulation of Focus Prominence takes into account the fact that, even though focus can affect the prosody of a sentence, there are certain (language-particular) prosodic principles and constraints that cannot be violated, even under focus. In (33), *neure lagunák* 'my friend' is prosodically visible, but its subconstituents are not, even if they are focused. The revised Focus Prominence principle thus determines that *neure lagunák*, not *neure*, has a prosodic peak (i.e. the phrasal accent on the last syllable of *lagunák*), even if the focus is just *neure*.

10.8 CONCLUSION

The current literature on focus projection is largely based on a consensus on two basic principles: Focus Prominence, which requires a focus to be phonologically prominent, and Default Prominence, which determines prosodic prominence independently of focus. In effect, focus projection is an epiphenomenon, derived from these principles, and no mechanisms of actual focus projection are needed. Although the NBB facts reviewed in the last section show that more research is needed on the relation between prosody and focus, especially in languages outside Germanic, it seems that they do not warrant straying too far from this consensus.

---

[24] As expected, lexically accented words contrast with lexically unaccented words precisely in this respect. When focused, lexically accented words are prosodically prominent, even when not immediately preverbal. See references cited above for relevant examples.

CHAPTER 11

··

CONSTRAINT CONFLICT AND INFORMATION STRUCTURE

··

VIERI SAMEK-LODOVICI

WHETHER the universal constraints of grammar conflict with each other or not is an empirical question. If they do, analyses that take this into account will provide better models of the underlying linguistic reality. The study of information structure (IS) is of particular interest in this respect, as constraint conflict approaches have proved particularly apt at modelling the conflicting constraints affecting constituents carrying discourse functions and showing how the associated empirical data reflect the different ways these conflicts are resolved. Complex patterns can then be explained in terms of simple and independently necessary constraints, while handling exceptions in a principled way and deriving cross-linguistic variation with minimal appeal to language specific provisos.

This chapter provides a survey of conflict-based analyses of IS in the last fifteen years (for a different approach see Aboh, this volume). Most analyses concern the effects of prosody on the syntax of focus, but purely syntactic analyses are mentioned too. Purely phonological studies on IS and prosodic phrasing are instead absent except for aspects of Truckenbrodt (1995) which fed many subsequent syntactic and prosodic analyses (but see Truckenbrodt, Zubizarreta, and Myrberg and Riad, in this volume). Conflict-based analyses not involving IS are also ignored except for Harford and Demuth (1999) which first considered how syntactic variation could emerge from the conflict between prosodic and syntactic constraints under an optimality-theoretic perspective.

For reasons of space, I concentrate on what I consider particularly significant claims, inevitably simplifying the original analyses and keeping the references there cited to a minimum. To convey the relations holding across different analyses, I also use invariant names for constraints with identical or similar definitions (similar in that the differences are irrelevant for the patterns discussed here), often departing from the original names. Readers interested in specific analyses are strongly invited to consult the original papers.

All analyses are cast in terms of Optimality Theory (Prince and Smolensky 1993, 2004). OT provides a formal definition of grammaticality under constraint conflict and