

Givenness, Focus, and Prosody

by

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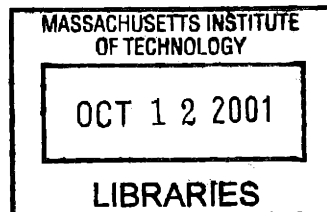
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Abstract

In this dissertation, I investigate the grammatical effects of focus and the inseparable phenomenon of *givenness*. As Schwarzschild (1999) has proposed, a proper understanding of givenness eliminates the need for a separate concept of focus, which is notoriously hard to define, either semantically, syntactically, or phonologically.

I propose a semantic constraint, the Givenness Interpretation Principle based on Rooth's (1992) Focus Interpretation Principle, that accounts, in part, for the semantic effects of givenness and focus. I also propose a phonological constraint, *GÍVEN, that accounts for the prosodic effects of givenness and focus in Chichewa, Japanese, Hungarian, and Italian.

Givenness and focus are represented in the syntax by a functional head G which takes a given constituent in its complement and a focussed constituent in its specifier. This is demonstrably the correct representation in Hungarian, and I propose that this is the representation of givenness and focus in Universal Grammar. A phrase may raise out of the complement of G to its specifier, either overtly as in Hungarian, or covertly at LF.

Givenness has demonstrable phonological effects that, as I show, cannot be ascribed to a FÓCUS constraint (Truckenbrodt 1995) requiring focussed constituents to be the most prominent in their domains of focus. The constraint *GÍVEN bars given constituents from being metrically prominent. Since the effects of FÓCUS and *GÍVEN are sometimes difficult to tease apart, I present an in-depth study of the phrasal phonology of Italian, showing how phonological and intonational phrases are formed in Italian, with the aid of the segmental phenomena of *raddoppiamento sintattico* and *gorgia toscana*. Once the constraints governing these phenomena are established, I present a rigorous, controlled comparison of the effects of *GÍVEN and FÓCUS in Italian, showing that it is *GÍVEN, not FÓCUS, that gives the correct results.

Thesis Advisor: Michael Kenstowicz, Professor of Linguistics

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My parents Bill and Gretta were immensely supportive, as was my sister Kathy, and my brothers John and Karl. My fiancée Deborah Beard made my last three years as a "gradual" student incredibly happy. That part is over. The rest is just beginning.

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1 Introduction

1.1 Overview

This Introduction gives an overview of the dissertation, and introduces the concepts of prosodic phonology, the syntactic framework adopted here, and Truckenbrodt's (1995) approach to the constraints that govern phonological phrasing.

Chapter Two discusses the representation of givenness and focus in Jackendoff (1972), Selkirk (1984, 1995), Rooth(1985, 1992) and Schwarzschild (1999), and proposes both a syntactic representation and an interpretation principle for givenness and focus.

Chapter Three looks at Truckenbrodt's proposed FOCUS constraint, and show how it works in Chichewa and Japanese. As I demonstrate, however, FOCUS does not give correct results in Hungarian. I will then propose a constraint *GIVEN that accounts for the focus and givenness effects in all three languages.

Chapter Four presents an Optimality Theoretic approach to the formation of phonological and intonational phrases in Italian. The segmental phenomena of *raddoppiamento sintattico* (RS) 'syntactic doubling' is frequently used to diagnose the location of phonological phrase boundaries. I will give the constraints that govern RS and those that govern phonological phrase formation in general, drawing on the work of Nespor and Vogel (1986), Chierchia (1986), Ghini (1993), and especially Frascarelli (2000). I will also briefly examine intonational phrase formation in Italian and the phenomenon of *gorgia toscana*, which is sometimes used to diagnose intonational phrase boundaries.

Chapter Five accounts in detail for the way givenness and focus affect Italian phrasing. The phenomena descriptively attributed to focus are complicated in Italian by the pervasive phenomenon of topicalization. I show how “focus restructuring” (Kenesei and Vogel 1993, Frascarelli 2000) works in Italian, both when topicalization accompanies focus and when it does not. In both cases, the resulting phrasing is the result of the constraints presented in Chapters Four, plus a single additional constraint, *GÍVEN. Finally, I show that these effects cannot be the result of a FÓCUS constraint.

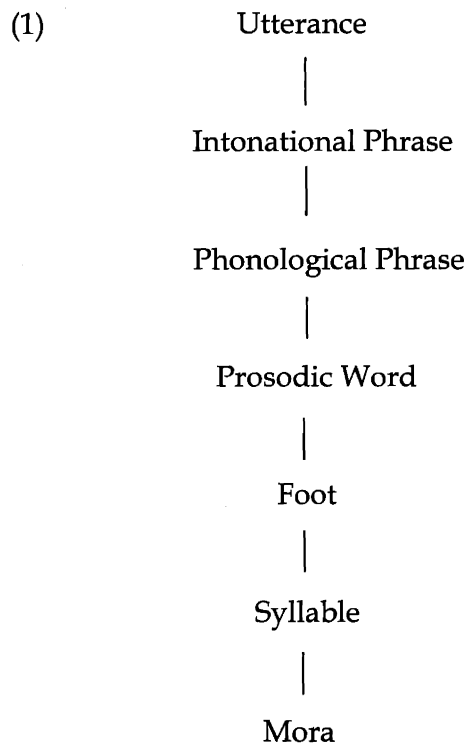
Chapter Six will present a brief conclusion.

1.2 Prosodic Phonology

Prosodic phonology has three aspects, namely phrasal, metrical, and tonal. These aspects are in principle orthogonal to each other and are represented in generative phonology as occurring on separate “tiers.” I will give a brief account of each.

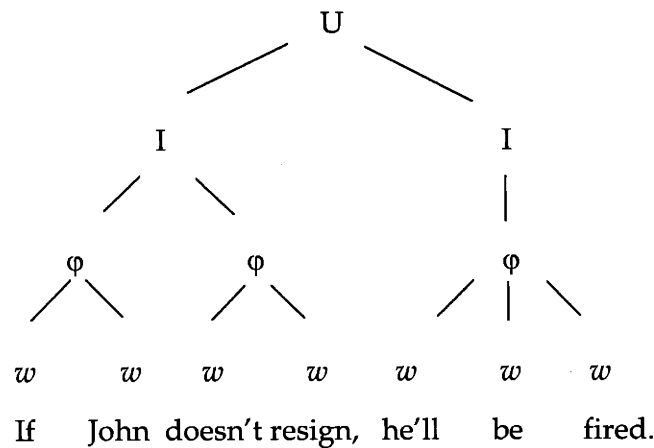
1.2.1 Phrasal Phonology

Following Selkirk (1995b), Truckenbrodt (1995), and many others, I will assume the prosodic hierarchy in (1).



In other words, an utterance U is divided into intonational phrases (noted I), which in turn are divided into phonological phrases (noted ϕ), which in turn are divided into prosodic words (noted w), etc. This is illustrated down to the level of the prosodic word in the example in (2).

(2)



Observations:

- Branching is not necessarily binary. It may be unary or ternary.
- Domination is strict. For example, intonational phrases may only dominate phonological phrases; they may not dominate prosodic words directly. This is formalized below.
- Prosodic constituents do not necessarily correspond to syntactic constituents. The prosodic word *he'll* is not a syntactic constituent, nor is the phonological phrase *if John*.

Selkirk (1995b) formalizes strict domination in the prosodic hierarchy with the constraints in (3) and the hypothesis in (4).

(3) *Constraints on Prosodic Domination*

(where C^n = some prosodic category)

- a. *Layeredness* No C^i dominates a C^j , $j > i$,
 e.g. "No syllable dominates a foot."
- b. *Headedness*¹ Any C^i must dominate a C^{i-1} ,
 e.g. "A prosodic word must dominate a foot."
- c. *Exhaustivity* No C^i immediately dominates a C^j , $j < i-1$,
 e.g. "No prosodic word immediately dominates a syllable."
- d. *Nonrecursivity*² No C^i dominates C^j , $j = i$.
 e.g. "No foot dominates a foot."

(4) *Strict Layer Hypothesis*

The Constraints on Prosodic Domination are inviolable.

Selkirk (1995b) suggests that the Strict Layer Hypothesis (4), which she had proposed in earlier work (Selkirk 1981, 1984), is in fact false, and that the individual constraints in (3) should be considered ranked and violable. See Truckenbrodt (1999) for evidence that Nonrecursivity (3d) is violable.

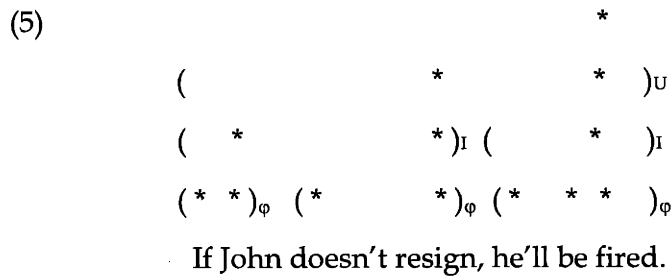
1.2.2 Metrical Grids

I have represented the prosodic structure of the sentence in (2) as a tree, but there is something absolutely crucial about the prosody of the sentence that the tree does not capture, namely the fact that in each phrase, one constituent, the

¹ For $i > 1$.

² Not nonreflexivity. It is not a question of e.g. a phonological phrase dominating itself, but of e.g. a larger phonological phrase dominating a smaller one.

head, is more prominent than the others. This is better depicted in a metrical grid, as shown in (5).



In (5), the rightmost constituent in each phrase is the head, which projects to the next level. This representation shows the relative prominence of each prosodic word in the utterance, as well as its division into intonational and phonological phrases.

The reader will perceive that, in the representation in (5), the metrical grid and the prosodic hierarchy are not orthogonal. On the contrary, the prosodic hierarchy is simply the bracketing of the grid, and conversely, the grid is simply a notation for showing the heads of prosodic constituents. This connection is formally stated by Truckenbrodt (1995) in (6).

(6) *Hypothesis about the Identity of Metrical and Prosodic Structure (HIMP)*

Metrical structure and prosodic structure are part of the same representation. The representation consists of constituents, with a grid mark representing the head of each constituent. It is hierarchically organized and subject to the constraints on domination of the Strict Layer Hypothesis.

I will assume that this hypothesis is correct.

1.2.3 The Tonal Tier

The tonal tier postulated by generative phonology consists of a sequence of high (H) and low (L) tones. Tones, in order to be pronounced, must “associate” with one or more syllables of a sentence (Goldsmith 1976). Pierrehumbert (1980) applied this system to English sentence intonation, and Pierrehumbert’s system has since been refined as the ToBI (tone and break index) standard (Beckman and Hirschberg 1994). ToBI postulates three types of tones: *pitch accents*, which must associate with a metrically prominent syllable, *phrase tones*, which mark the end of a phonological phrase, and *edge tones*, which mark the end of an intonational phrase. In the ToBI notation, pitch accents are indicated by a superscripted asterisk, e.g. H*, phrase tones by a superscripted minus sign, e.g. L⁻, and edge tones by a subscripted percent sign, e.g. L%. Pitch accents may be pure tones, i.e. H* or L*, or they may be contour tones, e.g. L+H* or L*+H. The position of the asterisk indicates which tone is most closely associated with the nucleus of the metrically prominent syllable that the pitch accent associates with.

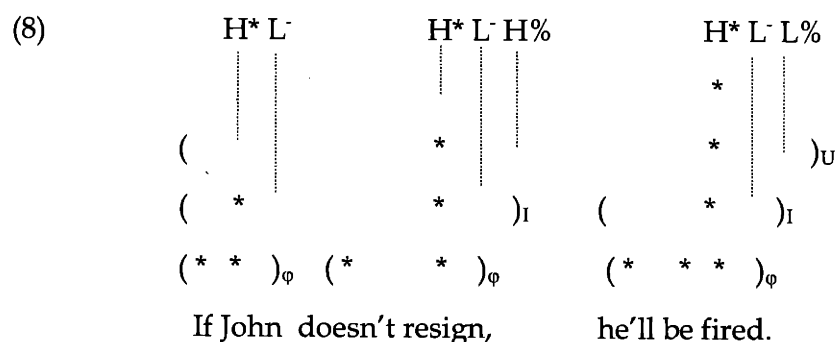
Recall from the previous section that the metrical grid for *If John doesn’t resign, he’ll be fired* is parsed into phonological and intonational phrases as (7).

(7)

				*						
(*		*) _U						
(*		*) _I	(*) _I				
(* *) _φ	(*		*) _φ	(* *	* *) _φ

If John doesn’t resign, he’ll be fired.

As is normally the case with neutral declarative sentences in English, each phonological phrase in (7) contains a high pitch accent (H*), which associates with the most prominent syllable in the phrase, and ends with a low phrase tone (L). The initial intonational phrase ends with a high edge tone (H%), as is often the case with an intonational phrase that is followed by another one, while the final intonational phrase ends with a low edge tone (L%). Thus, we get the tonal tier shown in (8).



The association lines in (8) show how the tonal tier aligns with the metrical grid and the prosodic constituents. Note that the tonal tier, unlike the metrical grid, does not indicate the relative prominence of the pitch accents. We see in (8) that *John* is metrically less prominent than *resign*, but they both have H* pitch accents. Like the metrical grid, the intonational tier is arguably not orthogonal to the prosodic hierarchy. See Hayes and Lahiri (1991).

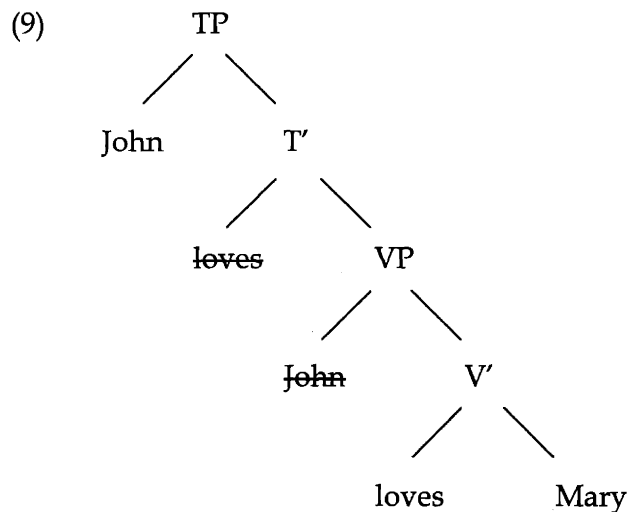
1.2.4 Phonological Notation

I will avoid the nearly universal and in my view unfortunate use of CAPITALS, **boldface**, and underlines to represent prominence, since these have

been used indiscriminately and in contradictory ways to represent either pitch accents, or metrical prominence, or focus, sometimes distinguishing contrastive from presentational focus, sometimes not. Instead, I will simply give a phonological representation of the sentence, showing no more detail than necessary.

1.3 Syntactic Representations

I will follow recent work on syntactic representation, e.g. Chomsky 1995, in assuming that a word or a phrase can be associated with more than one location in a syntactic tree. An example of this is shown in (9).



Observations:

- The lexical words *John* and *loves* are both associated with two locations in the tree.
- Only one of the positions associated with each lexical word is pronounced. This is indicated by the “strikethrough” notation used for nodes that are not pronounced.³

This type of representation is sometimes rather misleadingly referred to as the “copy theory of movement.” First of all, the question of “movement” and other computational issues are completely orthogonal to questions of representation.

³ This notation was suggested to me by Alec Marantz.

Secondly, multiple nodes in the tree may be associated with a single lexical item. They are not to be understood as copies.

To facilitate intuitive understanding of these representations, I may occasionally employ derivational terms such as “raising” or “covert” or “overt” movement. For example, I will use the term “covert movement” to describe a syntactic representation in which the highest node associated with a lexical item is not pronounced. These terms are to be understood as descriptions of representations only, with no commitment being made to a derivational theory of computation.

1.4 Phonological Phrase Formation

Truckenbrodt (1995, 1999) proposes an Optimality Theoretic (Prince and Smolensky 1993) approach to phonological phrase formation. Recall from §1.2.1.1 that phonological phrases are the constituents in the prosodic hierarchy immediately above the prosodic word and immediately below the intonational phrase. Truckenbrodt proposes that phonological phrase formation is governed by the constraints in (10).

- (10) WRAPXP Each lexically headed XP must be contained inside a \emptyset [i.e. inside a single phonological phrase].
- STRESSXP Each lexically headed XP must contain a phrasal stress x_{\emptyset} [i.e. the head of a phonological phrase].

Consider the sentences in (11) from Truckenbrodt (1995), showing their phonological phrasing with neutral intonation, i.e. with no focus.

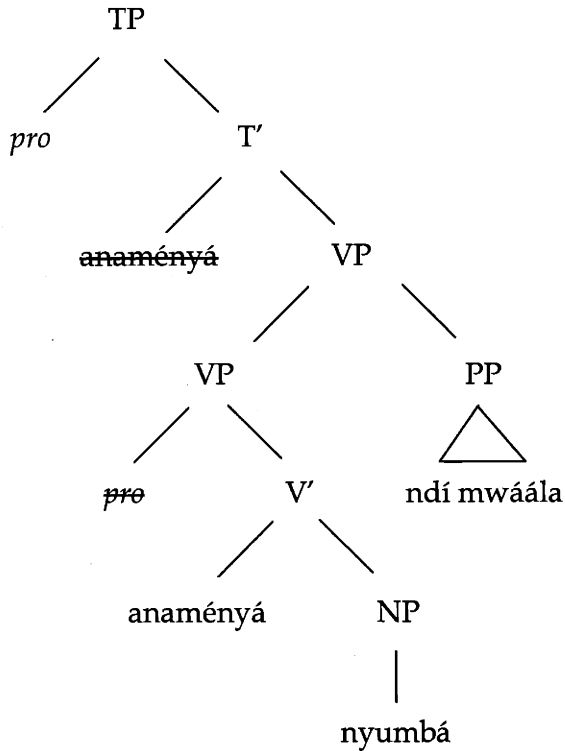
- (11) a. *Chichewa*
 (Anaményá nyumbá ndí mwáála)_φ
 hit.pres.3.sg. house with rock
 'He hit the house with a rock.'
- b. *Japanese*
 (Nágoya de)_φ (Mári ní átta)_φ
 Nagoya in Mary with met
 'I met with Mary in Nagoya.'

The difference in the way the sentences in (11) are phrased is due, not to their syntax, which *mutatis mutandis* is essentially the same, but to the difference in the ranking of WRAPXP and STRESSXP in Chichewa and Japanese, as shown in (12).

- (12) Chichewa: WRAPXP >> STRESSXP
 Japanese: STRESSXP >> WRAPXP

The syntax for (11a) is given in (13).

(13) *Anaményá nyumbá ndí mwáála.* 'He hit the house with a rock.'



Observations:

- I have shown *anaményá* 'he threw' as raising only covertly to T. The fact that it groups prosodically with the object suggests that it remains overtly in VP.
- To satisfy STRESSXP, the maximal projections of all three lexical words must contain the heads of phonological phrases. Since the NP and the PP are both inside the VP, stressing either of them will also stress VP. Therefore only NP and PP need to be stressed.
- To satisfy WRAPXP, the maximal projections of all three words must each be contained in a single phonological phrase. The NP and PP are both inside VP. Wrapping VP will therefore satisfy WRAPXP.

(14) *Chichewa*. Heads are assumed to be right.

[VP [VP anaményá [NP nyumbá]] [PP ndí mwáála]] 'He hit the house with a rock.'	WRAPXP	STRESSXP
☞ a. (anaményá nyumbá ndí mwáála) _φ		*
b. (anaményá nyuúmba) _φ (ndí mwáála) _φ	* !	

Observations:

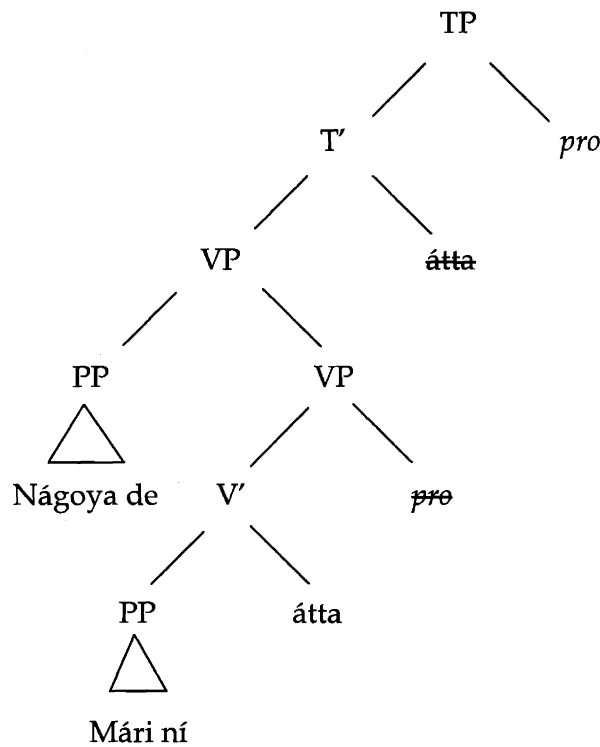
- The two phrasings affect both the vowel length and tonal pattern of *nyumbá* (14a) vs. *nyuúmba* (14b) 'house'. (Kanerva 1990)
- In (14a), the maximal VP is contained in a single phonological phrase. WRAPXP is therefore satisfied.
- In (14b), the maximal VP is split between two phonological phrases. WRAPXP is therefore violated.
- Heads are assumed to be right. *Mwáála* 'rock' is therefore the head of the single phonological phrase in (14a). *Nyumbá* is therefore *not* the head of a phonological phrase. This creates a violation of STRESSXP.
- *Nyuúmba* and *mwáála* are heads of phonological phrases in (14b), thus STRESSXP is satisfied. (Recall from the observations on the tree in (13) that *anaményá* does not need to be the head of a phonological phrase.)
- Since WRAPXP is the most highly ranked constraint here, the violation in (14b) is fatal, as shown by the exclamation point. (14a) is therefore the winner, as shown by the little hand.
- Since the winner is determined solely on the basis of WRAPXP, the violations of STRESSXP are irrelevant. This is indicated by shading.
- The identity of the winner is confirmed by the vowel length and tonal pattern of *nyumbá*.

Now consider the Japanese sentence in (11b), repeated here as (15).

- (15) (Nágoya de)_φ (Mári ní átta)_φ
Nagoya in Mary with met
'I met with Mary in Nagoya.'

The syntax of this sentence is the mirror image of (13), as shown in (16).

(16)



Observations:

- As in (13), I have shown the verb raising only covertly to T, and for the same reason: the verb groups prosodically with the object.
- The sentence contains three lexical heads: *Nágoya*, *Mári*, and *áttá*. The maximal projections of all three must contain the heads of phonological phrases to satisfy STRESSXP. However, *Nágoya* and *Mári* are inside the maximal projection of VP. Stressing *Nágoya* or *Mári* will therefore stress VP. Therefore only *Nágoya* and *Mári* need to be stressed.
- To satisfy WRAPXP, the maximal projections of all three lexical words must be inside a single phonological phrase. Since *Nágoya* and *Mári* are inside VP, only the VP needs to be wrapped.

(17) *Japanese*. Heads are assumed to be left.

[_{VP} [_{PP} <i>Nágoya de</i>] [_{VP} [_{PP} <i>Mári ní</i>] <i>átta</i>]]]	STRESSXP	WRAPXP
'I met with Mary in Nagoya.'		
a. (<i>Nágoya de Mári ní átta</i>) _φ	*!	
☞ b. (<i>Nágoya de</i>) _φ (<i>Mári ní átta</i>) _φ		*

Observations:

- Heads are assumed to be left. *Nágoya* is therefore the head of the single phonological phrase in (17a). *Mári* is therefore *not* the head of a phonological phrase. This creates a violation of STRESSXP.
- *Nágoya* and *Mári* are both heads of phonological phrases in (17b). STRESSXP is therefore satisfied. (Recall from the observations on the tree in (16) that *átta* 'met' does not need to be the head of a phonological phrase.)
- In (17a), the maximal VP and the NP's it contains are all contained in a single phonological phrase. WRAPXP is therefore satisfied.
- In (17b), the maximal VP is split between two phonological phrases. WRAPXP is therefore violated.
- Since STRESSXP is the highest ranked constraint here, the violation in (17a) is fatal. (17b) is therefore the winner.

Comparison of the tableaux in (14) and (17) shows that the difference in phrasing of the sentences in (11) is indeed due to the difference in ranking in (12), repeated here as (18).

(18) Chichewa: WRAPXP >> STRESSXP
Japanese: STRESSXP >> WRAPXP

2 The Representation of Givenness and Focus

2.1 Jackendoff (1972)

Like the use of capitals to represent prominence that is in some sense focus-related, another nearly universal convention in the study of focus and givenness is the practice of “F-marking” constituents that are in some sense focussed. The notation was introduced by Jackendoff (1972).

How can [focus] be incorporated into the grammar? I suggest the following way, which does minimal violence to the theory as a whole. One artificial construct is required: a syntactic marker F which can be associated with any node in the surface structure. Since F is of relevance only in the surface structure and phonology, it can be introduced either by an attachment transformation like the *Syntactic Structures* rule for introducing negation...or by an extension of the phrase structure rules...The semantic material associated with surface structure nodes dominated by F is the Focus of the sentence. To derive the Presupposition, substitute appropriate semantic variables for the focussed material. Since a well-formed semantic interpretation of the sentence must be divided into a Focus and a Presupposition, well-formedness conditions will indirectly ensure that F occurs somewhere in the surface structure. (pp. 240-1)

The process, for Jackendoff either a transformation or a rule, that inserts the syntactic marker F into the syntactic representation is called focus assignment or F-marking. F-marking a constituent evokes a set of alternatives to that constituent in the context of the portion of the sentence that is not F-marked. Jackendoff uses F-marking to account for the relation that he proposes between sentential stress and focus, which he gives informally in (19a) and formally in (19b).

(19) Focal Stress Rule⁴

- a. 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.
- b. [1 stress] → [emphatic stress] / [X__Y]_F

Jackendoff thus proposes that two distinct processes must occur in all sentences: focus assignment and stress assignment. The relation between these two processes is given in the Focal Stress Rule (19). Stress within the F-marked phrase is assigned by the Nuclear Stress Rule, which is given in Selkirk's (1995a) formulation in (20).

(20) Nuclear Stress Rule

The most prominent syllable of the rightmost constituent in a phrase P is the most prominent syllable of P.

An example of Jackendoff's approach, based on an example from Selkirk (1995a), is shown in (21).

(21) A: What did Mary do?

[emphatic stress]

|

B: Mary [bought a book about bats]_F

⁴ This name is mine, not Jackendoff's.

The question *What did Mary do?* (21A) evokes a set of alternatives of the form *Mary _____*. Thus Jackendoff would F-mark *Mary bought a book about bats* as *Mary [bought a book about bats]_F* (21B). The Nuclear Stress Rule (20) tells us that the most prominent word in the phrase *bought a book about bats* will be *bats*. The Focal Stress Rule (19) in turn tells us that *bats*, the most prominent word in the F-marked phrase, will get emphatic, i.e. sentential, stress.

2.2 Selkirk (1984, 1995a)

Selkirk (1984) notes that there are two fundamental problems with Jackendoff's approach to focus assignment and its relation to stress assignment. First, there are many languages, e.g. German, in which the Nuclear Stress Rule does not hold, and this in turn casts doubt on whether it is the right generalization even for English. Second, claiming that focus assignment and stress assignment are distinct processes seems to be missing an important generalization, since they are both about relative prominence. Selkirk proposes that these two problems have the same solution: focus and stress are in fact assigned in the same process, and this process eliminates the need for the Nuclear Stress Rule.

To begin with, she observes that the phonological reflex of focus is not stress, but pitch accent, that is, a high or a low tone that must associate with a metrically prominent syllable. Maximal metrical prominence must fall on syllables that have pitch accents, according to the Pitch Accent Prominence Rule.

(22) Pitch Accent Prominence Rule

A syllable associated to a pitch accent has greater stress prominence than a syllable which is not associated to a pitch accent.

Selkirk proposes that both of the problems noted above are solved if we see that focus and accent are initially assigned *at the same time*. This is the Basic Focus Rule (23).

(23) Basic Focus Rule

An accented word is F-marked.

Focus then *projects* from the accented, F-marked word to constituents containing the word according to the rules given in (24).

(24) Focus Projection Rules

- a. F-marking of the *head* of a phrase licenses the F-marking of the phrase.
- b. F-marking of an *internal argument* of a head licenses the F-marking of the head.

Focus Projection is a classic example of a recursive definition. As an example, consider the sentence in (25), from Selkirk (1995a), with the word *bats* F-marked and accented.

(25) A: What did Mary do?

H*
|

B: Mary bought a book about bats_F

Since *bats* is F-marked, F-marking of the head of the PP *about* is also licensed, and the PP itself can be F-marked. If the PP *about bats* is an argument of the noun *book*, F-marking of *book* is licensed, which in turn licenses F-marking of the phrase *a book about bats*. Finally, F-marking of the argument *a book about bats* licenses F-marking of *bought*, which in turn licenses F-marking of the phrase *bought a book about bats*. The end result is shown in (26), where the top level of F-marking is distinguished as FOC, which corresponds to Jackendoff's F-marking (cf. (21)). The FOC-marked phrase is what Selkirk calls "focus," which evokes a set of alternatives⁵ in the same sense as Jackendoff (1972). Embedded F-marking, on the other hand, represents "new information." Lack of F-marking, finally, represents "old information."⁶

(26) A: What did Mary do?

H*
|

B: Mary [bought_F [a book_F [about_F bats_F]_F]_F]_{FOC}

Another problem that Selkirk (1984) points out with Jackendoff's approach arises with examples like the one in (27).

⁵ Selkirk does not state this formally, but it is clear from her examples.

⁶ Formally, we may take "old information" to represent givenness in the sense of Schwarzschild (1999), and "new information" to represent lack of givenness. See §2.4

(27) A: Do you like the *William Tell Overture*, by Rossini?

[Hums it. It's familiar as TV theme music...]

$$\begin{array}{c}
 * \\
 (\quad * \quad * \quad)_U \\
 (* \quad *)_I (* \quad *)_I \\
 (* *)_\phi (* *)_\phi (* *)_\phi (* *)_\phi
 \end{array}$$

B: I didn't even know it was by_F Rossini.⁷

Jackendoff's Focal Stress Rule (19) states that maximal prominence must fall on the syllable of the Focus that is assigned stress by the Nuclear Stress Rule. In the case of (27) this can only be true if the Focus of (27) is the single word *by*. If we apply Jackendoff's approach to get the meaning of (27), we predict the evocation of a set of alternatives of the form *I didn't even know it was {about, for, etc.} Rossini*. This is clearly the wrong meaning; no such set of alternatives is evoked.

Selkirk's focus projection approach, on the other hand, evokes the right alternatives in (27). Focus in (27) projects from the head *by* to the maximal projection *by Rossini*, as shown in (28).

(28) I didn't even know it was [by_F Rossini]_{FOC}.

Recall that for Selkirk, embedded and unembedded F-marking have different meanings. Embedded F-marking corresponds to "new information". On the other hand, unembedded, i.e. top-level, F-marking evokes a set of alternatives in the sense of Jackendoff (1972). Selkirk distinguishes the top level of F-marking as FOC, as shown in (28). Thus we predict that (28) should evoke a set of

⁷ Most but not all native speakers I consulted accept this pattern of prominence.

alternatives of the form *I didn't even know it was {an overture, part of an opera, etc.}*. This prediction seems right. The meaning of the F-marking of *by* is more problematic, however. The preposition *by* is repeated verbatim from the question. It is clearly not "new information."

The same problems arise, both for Jackendoff and for Selkirk, with a well-known example from Ladd (1980), which I have modified slightly in (29).

(29) A: Did Bill read *Monica's Story*?

$$\begin{array}{cccc}
 H^* L^- & & H^* & L^- L\% \\
 & & * & \\
 (* & & * &)_{\pi} \\
 (*)_{\phi} & (* & * & *)_{\phi}
 \end{array}$$

B: Bill doesn't read_F books.

Again, Jackendoff's theory would predict that (29B) would evoke a set of alternatives of the form *{write, burn, review, ...} books*. But the clear intuition of native speakers of English is that no such alternatives are evoked. On the other hand, Selkirk's theory would account for (29B) as an example of focus projection. But this would require that the accented word *read* represent "new information", which it doesn't in this context. On the contrary, *read* is repeated verbatim from (29A). It is the word *doesn't* that contains the "new information" in (29B). Yet this word is unaccented.

2.3 Rooth (1985, 1992)

2.3.1 Alternative Semantics

Rooth (1985) introduced a formal semantic analysis of focus called *alternative semantics*. According to alternative semantics, every syntactic constituent α has two meanings, its *ordinary* semantic value, denoted $[[\alpha]]^\circ$, and its *focus* semantic value, denoted $[[\alpha]]^f$. The focus semantic value is the set of meanings of the same type as the ordinary semantic value, but with the substitution of variables of the correct type in place of any F-marked constituents. An example from Rooth (1992) is shown in (30), where E is the domain of individuals.

- (30) a. $[[\text{Mary}_F \text{ likes Sue}]]^\circ = [[\text{Mary likes Sue}_F]]^\circ$
 $= [[\text{Mary likes Sue}]]^\circ$
 $= \text{like}(\mathbf{m}, \mathbf{s})$
- b. i. $[[\text{Mary}_F \text{ likes Sue}]]^f = \{ \text{like}(x, \mathbf{s}) \mid x \in E \}$
 ii. $[[\text{Mary likes Sue}_F]]^f = \{ \text{like}(\mathbf{m}, y) \mid y \in E \}$

The focus semantic value of α can be thought of as a set of alternatives to the ordinary semantic value of α . Note that $[[\text{Mary}_F \text{ likes Sue}]]^\circ \in [[\text{Mary}_F \text{ likes Sue}]]^f$, and in general $\forall \alpha, [[\alpha]]^\circ \in [[\alpha]]^f$.

All syntactic constituents have ordinary and focus semantic values, not just sentences. Another example from Rooth (1992) is shown in (31).

- (31) $[[\text{American}_F \text{ farmer}]]^\circ = \lambda x [\text{American}(x) \wedge \text{farmer}(x)]$
 $[[\text{American}_F \text{ farmer}]]^f = \{ \lambda x [P(x) \wedge \text{farmer}(x)] \mid P: E \rightarrow \text{propositions} \}$

Rooth (1992) shows that the distinction between focus and ordinary semantic values sheds light on the phenomenon of *contrastive focus* in an example like (32), “which is to be thought of as the beginning of a joke.”

(32) An American_F farmer was talking to a Canadian_F farmer.

Rooth proposes the interpretation rule in (33).

(33) Construe a phrase α as *contrasting* with a phrase β if $[[\beta]]^o \in [[\alpha]]^f$.

The relation of contrast defined in (33) is symmetric, that is, α contrasts with β iff β contrasts with α . Somewhat counter-intuitively, it is also reflexive, that is, any α contrasts with itself.

The reader can verify that, defining $[[\text{Canadian}_F \text{ farmer}]]^o$ on the model of (31), *American_F farmer* does indeed contrast with *Canadian_F farmer*, since $[[\text{Canadian}_F \text{ farmer}]]^o \in [[\text{American}_F \text{ farmer}]]^f$.

2.3.2 Focus Interpretation

Rooth (1992) hypothesizes that the only operator that has access to focus semantic values is the *focus interpretation operator*, noted with a tilde (\sim). The focus interpretation operator \sim takes a syntactic constituent α and an anaphoric variable γ such that that $\alpha \sim \gamma$ introduces the following constraint, which I give in

Rooth's "first version" of the "individual" case (34).⁸ For a reformulation of (34) in terms of presupposition, see Rooth (1992).

(34) *Focus Interpretation Principle*

In interpreting focus at the level of a phrase α , add a constraint that:

$$\gamma \in [[\alpha]]^f$$

[such that] γ is a variable matching α in type.

In the case of the example in (32), interpreting *An American_F farmer was talking to a Canadian_F farmer* introduces two variables γ_1 and γ_2 such that the F-marking in *American_F farmer* is interpreted by the focus interpretation operator as $[\text{American}_F \text{ farmer}] \sim \gamma_1$, while the F-marking in *Canadian_F farmer* is interpreted as $[\text{Canadian}_F \text{ farmer}] \sim \gamma_2$. These interpretations introduce the constraints in (35).

- (35) a. $\gamma_1 \in [[\text{American}_F \text{ farmer}]]^f$
 b. $\gamma_2 \in [[\text{Canadian}_F \text{ farmer}]]^f$

These constraints are satisfied if $\gamma_1 = [[\text{Canadian}_F \text{ farmer}]]^\circ$ and $\gamma_2 = [[\text{American}_F \text{ farmer}]]^\circ$, that is, if γ_1 is anaphoric to *Canadian farmer* and γ_2 is anaphoric to *American farmer*. The constraint on γ_1 requires that forward anaphora be possible within a sentence, at least in the case of focus variables. This perhaps accounts for the slight strangeness of (32).

⁸ I give the first version since it is more comparable to the approach in Schwarzschild (1999), which I discuss below. The "set" case is a trivial generalization of the "individual" case.

Rooth refers to the constituent which is interpreted by the focus interpretation operator as the *scope* of the focus. Thus the NP *American_F farmer* is the scope of the focus on *American_F*. Rooth comments:

It is convenient to use the term “scope” for this dimension, in agreement with those who actually contemplate scoping focused phrases as a prerequisite to interpretation (Chomsky 1976, von Stechow 1982). To the extent that there is a correlation between the scope of the ~ operator and the phonological domain of prominence for a focus, as there surely is, a theory of focus realization should enforce the correlation. If the ~ operator were present only at LF, it could not serve the purpose of delimiting a phonological domain of prominence. Perhaps the solution is simply that it is present at other levels also, including the input to phonological interpretation. (1992: 114)

2.4 Schwarzschild (1999)

Schwarzschild (1999) notes that there is very little agreement about what focus means. He quotes Halliday (1967) as giving no less than three definitions⁹, which are listed in (36).

- (36) a. Textually and situationally non-derivable information, or
b. Contrary to some predicted or stated alternative, or
c. Replacing the WH-element in a presupposed question.

English examples of each of these are shown in (37), where I have adopted Schwarzschild’s notation, with F-marking to show foci and capitalization to show pitch accents. Each example is to be thought of as an imaginary conversation between A and B.

- (37) a. A: Gore's mother is a Democrat.
 B: [She [VOTED_F for him]_F]_F
- b. A: Who did Gore's mother vote for?
 B: She voted for HIM_F
- c. A: Bush's mother is a Democrat.
 B: [She [voted_F for GORE_F]_F]_F
- d. A: Gore's mother voted for Bush.
 B: She voted for GORE_F

"Textually or situationally non-derived information" (36a) is often simply called "new information." Clearly this definition of focus is inapplicable to the presumed foci of (37b) and (37d). Likewise, "contrary to some predicted or stated alternative" (36b) will not work for (37a), (37b) and (37c), nor will "replacing the WH-element in a presupposed question" (36c) work for (37a), (37c) or (37d).

Schwarzschild (1999) notes that in contrast to the three definitions of focus in (36), Halliday (1967) proposed only a single definition for givenness: "anaphorically recoverable." Schwarzschild comments:

Halliday's difficulties arise from a redundancy in his system. 'Given' and 'new' [i.e. focus] are originally introduced as concepts that are complementary both in their definition as well as in their reflex in the phonology. The correct theory should therefore only make reference to one of them. Since, as noted above, 'given' receives a straightforward interpretation, I suggest that its complement, 'new', be eliminated from

⁹ Halliday gives these as definitions of the term "new". Given the definitions, I think it is clear that he means is what is usually, at least in the generative literature, called "focus."

the theory. The correlation with phonology argues in this direction as well.”

Schwarzschild’s proposal is that the accentual pattern of English arises from the interaction of the semantics of givenness and the phonology and syntax of F-marking. The semantics of focus *per se* have no role whatsoever. Givenness, however, has a semantic definition, which I will give in Schwarzschild’s “final informal version” (38). For the formal version, see Schwarzschild (1999).

- (38) An utterance [or other constituent¹⁰] U counts as GIVEN iff it has a salient antecedent A and:
- a. if U is of type e, then A and U co-refer.
 - b. otherwise: modulo \exists -type shifting, A entails the Existential-F-Closure of U.

I will explain this definition with the help of an example from Schwarzschild (1999) in (39).

- (39) A: John ate a green apple.
B: No, he ate a [RED¹¹]_F apple.

In the context of a brief conversation like the one in (39), the sentence uttered in A counts as a “salient antecedent” for B. We would like the noun *apple* in B to count as given by virtue of the fact that *apple* was mentioned in A. Givenness is defined in terms of entailment, and $\lambda x \text{ apple}(x)$ is of the wrong type to entail $\lambda x \text{ apple}(x)$. This is where \exists -type shifting comes in, since $\exists x \text{ apple}(x)$ does entail

¹⁰ Schwarzschild clearly intends this definition to apply to any syntactic constituent, not just a whole utterance.

$\exists x$ *apple(x)*. Finally, the Existential-F-Closure is the result of replacing F-marked words with existentially bound variables. If we replace the F-marked word *red* in B with an existentially bound variable, we get $\exists Y$ [*John ate a Y apple*], which is entailed by *John ate a green apple*.

Drawing on the semantic criterion of givenness (38), Schwarzschild proposes the constraints in (40), with the ranking in (41).

- (40) GIVENness A constituent that is not F-marked is GIVEN.
AvoidF Do not F-mark.
FOC A FOC-marked phrase is accented.¹²
HeadArg A head is less prominent than its internal argument.¹³

- (41) GIVENness, FOC >> AvoidF >> HeadArg

To these must be added Selkirk's Basic Focus Rule (23), repeated here as (42).

- (42) Basic Focus Rule
An accented word is F-marked.

I see no reason the rule in (42) cannot be thought of as a highly ranked *constraint* BFC, giving us the overall ranking in (43).

- (43) BFC, GIVENness, FOC >> AvoidF >> HeadArg

¹¹ Capitalization here denotes the presence of a pitch accent.

¹² Recall that in Selkirk's theory, FOC designates the top level of F-marking. See §2.2.

¹³ E.g. a verb is less prominent than its object.

For examples of how Schwarzschild's constraints work, let us return to the examples in (37), repeated here as (44). I will follow Schwarzschild's convention of capitalizing words with pitch accents.

- (44) a. A: Gore's mother is a Democrat.
 B: [She [VOTED_F for him]_F]_F
- b. A: Who did Gore's mother vote for?
 B: She voted for HIM_F
- c. A: Bush's mother is a Democrat.
 B: [She [voted_F for GORE_F]_F]_F
- d. A: Gore's mother voted for Bush.
 B: She voted for GORE_F

Observations:

- In (44d(B)), *Gore* is semantically given (it refers to an antecedent in (44d(A))), and yet it is F-marked.
- In (44c(B)), *Gore* is **not** given, and it is F-marked.
- (44c(B)) and (44d(B)) have different F-marking, yet they are pronounced the same.
- In (44b(B)), *him* is given, as it always is, and yet it is F-marked and accented.
- In (44a(B)), *him* is not F-marked and not accented.
- In (44a(B)), *voted* is F-marked and accented.
- In (44c(B)), *voted* is F-marked and **not** accented.
- In (44b(B) and (44d(B))), *voted* is not F-marked and not accented.
- There is no one-to-one connection between givenness and F-marking.
- There is no one-to-one connection between F-marking and accent.

Schwarzschild (1999) gives no tableaux illustrating the interaction of the constraints in (43), but I think it would be useful here to construct one. A tableau for (44d) is given in (45). Note that in example (44d), *Gore* and *voted* are both given according to the definition of givenness in (38), but if there were no F-marking on *Gore* the VP *voted for Gore* would not be, since nothing in (44d(A)) implies that anyone voted for Gore, much less his mother.

(45) Capitalization indicates a pitch accent.

A: Gore's mother voted for Bush. B: She voted for GORE _F	BFC	GIVEN- ness	FOC	AvoidF	HeadArg
a. She VOTED _F for GORE _F				**!	
b. She VOTED for GORE _F	*!			*	
c. She VOTED _F for GORE	*!	*		*	
d. She VOTED for GORE	*!*	*			
e. She voted _F for GORE _F			*!	**	
f. She voted for GORE _F				*	
g. She voted _F for GORE	*!	*	*	*	
h. She voted for GORE	*!	*			
i. She VOTED _F for Gore _F			*!	**	*
j. She VOTED for Gore _F	*!		*	*	*
k. She VOTED _F for Gore		*!		*	*
l. She VOTED for Gore	*!	*			*
m. She voted _F for Gore _F			*!	**	
n. She voted for Gore _F			*!	*	
o. She voted _F for Gore		*!	*	*	
p. She voted for Gore		*!			
q. She [VOTED _F for GORE _F] _F				**!*	
r. She [VOTED for GORE _F] _F	*!			**	
s. She [VOTED _F for GORE] _F	*!			**	
t. She [VOTED for GORE] _F	*!*			*	
u. She [voted _F for GORE _F] _F				**!*	
v. She [voted for GORE _F] _F			*!	**	
w. She [voted _F for GORE] _F	*!			**	
x. She [voted for GORE] _F	*!			*	
y. She [VOTED _F for Gore _F] _F				**!*	*
z. She [VOTED for Gore _F] _F	*!		*	**	*
aa. She [VOTED _F for Gore] _F				**!	*
bb. She [VOTED for Gore] _F	*!			*	*
cc. She [voted _F for Gore _F] _F			*!	***	
dd. She [voted for Gore _F] _F			*!	**	
ee. She [voted _F for Gore] _F			*!	**	
ff. She [voted for Gore] _F			*!	*	

Observations:

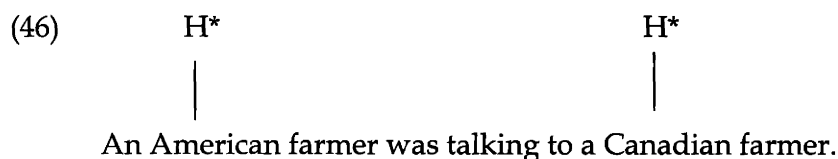
- The candidates range over the possible combinations of F-marking and accent for *voted* and *Gore*, and the VP *voted for Gore*.
- (45b) violates BFC, the Basic Focus Constraint (42), since *voted* is accented but not F-marked.
- (45d) violates GIVENness, since nothing is F-marked, but *voted for Gore* is not given.
- (45e) violates FOC, since the F-marking on *voted* is undominated, yet *voted* is not accented. (45e) may be contrasted with (45u), in which *voted* is F-marked and unaccented, but this is OK because *voted* is immediately dominated by an F-marked VP.
- (45f), the winning candidate, has one violation of AVOIDF, since *Gore* is F-marked.
- (45i) violates HEADARG, since the accented head *voted* is more prominent than its unaccented internal argument *Gore*.
- (45f) vs. (45h) shows the ranking BFC >> AVOIDF, that is, it is worse for an accented word not to be F-marked than to F-mark a word.
- (45f) vs. (45h) also shows the ranking GIVENness >> AVOIDF, that is it is worse not to F-mark a constituent that is not given than to F-mark a word.

The crucial thing to note about these constraints and their interactions is that for Schwarzschild, F-marking is a purely abstract notation, which is given no semantic or phonological meaning whatsoever. No use is made of Selkirk's Focus Projection Rules (24), so that in addition to being semantically and phonological undefined, F-marking is syntactically unconstrained. As

Schwarzschild observes, this is not a desirable situation theoretically, and he conjectures that F-marking can be eliminated entirely.

2.5 The Givenness Interpretation Principle

Let us compare Rooth's and Schwarzschild's approaches by returning to the example from Rooth (1992) in (46).



Rooth and Schwarzschild would F-mark this as shown in (47a) and (47b), respectively. I have indexed the two occurrences of *farmer* to facilitate the discussion below.

- (47)
- a. An American_F farmer₁ was talking to a Canadian_F farmer₂
 - b. [An American_F farmer₁ [was talking_F to a Canadian_F farmer₂]_F]_F

Schwarzschild would F-mark the verb *talking*, the verb phrase, and the sentence as a whole because they are not "given" in the sense that he defines.¹⁴ Recall Schwarzschild's GIVENness constraint (40), repeated here as (48).

- (48) *GIVENness* A constituent that is not F-marked is GIVEN.

¹⁴ I am assuming that, under Schwarzschild's approach, the two instances of *farmer* can act as antecedents for each other. If they could not, the first would have to be accented.

The given constituents in (47b) are *farmer₁*, *farmer₂*, *American_F farmer₁*, and *Canadian_F farmer₂*. Let us show this formally, since I will be using this fact below. Recall Schwarzschild's definition of givenness (38), repeated here as (49).

- (49) An utterance [or other constituent] U counts as GIVEN iff it has a salient antecedent A and:
- a. if U is of type e, then A and U co-refer.
 - b. otherwise: modulo \exists -type shifting, A entails the Existential-F-Closure of U.

- *farmer₁*:
 - The salient antecedent is *farmer₂*.
 - Since *farmer₁* has no F-marked constituents, its existential F-closure is λx **farmer**(x), i.e. its ordinary meaning.¹⁵
 - $[[farmer_2]] = \lambda x$ **farmer**(x)
 - $\exists x$ **farmer**(x) entails $\exists x$ **farmer**(x)
 - Therefore, modulo \exists -type shifting, $[[farmer_2]]$ entails the existential F-closure of $[[farmer_1]]$
 - Therefore, *farmer₁* is given.
- *farmer₂*: same as *farmer₁*
- *American_F farmer₁*:
 - The salient antecedent is *Canadian_F farmer₂*.
 - The ordinary meaning of *American_F farmer₁* is λx [**American**(x) \wedge **farmer**(x)]

¹⁵ The ordinary meaning is the only meaning relevant for Schwarzschild. The semantic focus meaning is distinguished from the ordinary meaning by taking the existential F-closure.

- The existential F-closure of *American_F farmer₁* is therefore $\lambda x \exists P [P(x) \wedge \mathbf{farmer}(x)]$
- The ordinary meaning of *Canadian_F farmer₂* is $\lambda x [\mathbf{Canadian}(x) \wedge \mathbf{farmer}(x)]$
- $\exists x [\mathbf{Canadian}(x) \wedge \mathbf{farmer}(x)]$ entails $\exists x \exists P [P(x) \wedge \mathbf{farmer}(x)]$
- Therefore, modulo \exists -type shifting, $[[\mathbf{Canadian}_F \mathbf{farmer}_2]]$ entails the existential F-closure of $[[\mathbf{American}_F \mathbf{farmer}_1]]$
- Therefore *American_F farmer₁* is given.
- *Canadian_F farmer₂*: same mutatis mutandis as *American_F farmer₁*

The phrases *American_F farmer* and *Canadian_F farmer* have a special status in Rooth's approach, too. As we saw in §2.3.2, they are the scopes of the foci on *American* and *Canadian*. That is, for Rooth, they have the LF's in (50).

(50) An $[[\mathbf{American}_F \mathbf{farmer}] \sim \gamma_1]$ was talking to a $[[\mathbf{Canadian}_F \mathbf{farmer}] \sim \gamma_2]$

We have shown that, in this example, Rooth's scopes of foci are given constituents in the sense of Schwarzschild (1999). Moreover, Schwarzschild's given constituents that contain foci are scopes of foci in the sense of Rooth (1992).¹⁶ I will conjecture that this is true generally, and that Rooth's Focus interpretation Principle (34), repeated here as (51a), can be replaced with the Givenness Interpretation Principle in (51b).

¹⁶ This was independently observed by Sauerland (1998), working with an earlier version of Schwarzschild's paper.

(51) a. *Focus Interpretation Principle* (Rooth 1992)

In interpreting focus at the level of a phrase α , add a constraint that:

$$\gamma \in [[\alpha]]^f$$

[such that] γ is a variable matching α in type.

b. *Givenness Interpretation Principle*

In interpreting a given constituent α , add a constraint that:

$$\gamma \in [[\alpha]]^f$$

[such that] γ is a variable matching α in type.

Since, by conjecture, all scopes of focus are given, the Givenness Interpretation Principle can replace the Focus Interpretation Principle when the constituent α contains a focus. But the Givenness Interpretation Principle is also valid when α does not contain a focus. In this case, the focus semantic value of α is the singleton set containing its ordinary semantic value, i.e. $[[\alpha]]^f = \{ [[\alpha]]^\circ \}$. To satisfy the constraint added by the Givenness Interpretation Principle, we must therefore have $\gamma = [[\alpha]]^\circ = [[\alpha]]$. But α is, by hypothesis, given. It therefore has a salient antecedent A for the variable γ . The constraint is therefore satisfied. In the case of the example in (47), a given constituent that does not contain a focus is *farmer₁*. The Givenness Interpretation Principle in this case adds a constraint that $\gamma \in [[\textit{farmer}_1]]^f$ such that γ is a variable matching *farmer₁* in type. $[[\textit{farmer}_1]]^f = \{ [[\textit{farmer}_1]]^\circ \}$. We must therefore have $\gamma = [[\textit{farmer}_1]]^\circ = [[\textit{farmer}_1]] = \lambda x \textit{farmer}(x)$. This is the meaning of *farmer₂*. Therefore, if the antecedent of γ is *farmer₂*, the constraint is satisfied.

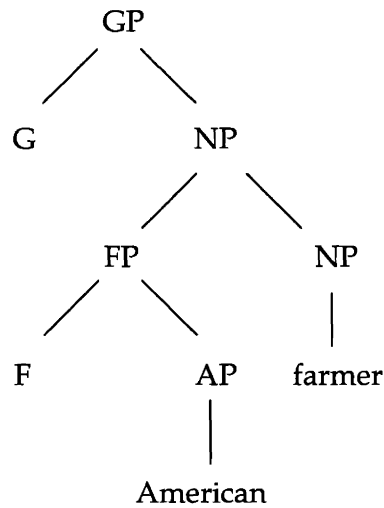
In Rooth's approach, focus is always interpreted by the Focus Interpretation Principle. Therefore every F-marked constituent must be

dominated by a scope of focus to which the focus interpretation operator \sim is adjoined. I have suggested that the Focus Interpretation Principle can be replaced with the Givenness Interpretation Principle. I must therefore also claim that focus is always interpreted by the Givenness Interpretation Principle, and that every F-marked constituent must be dominated by a given constituent that is its scope of focus. Given constituents however, do not need to dominate focussed constituents, and they are also interpreted by the Givenness Interpretation Principle. Suppose that, in a manner analogous to F-marking, we *G-mark* constituents that are given. Then we would have the two possible configurations shown in (52).

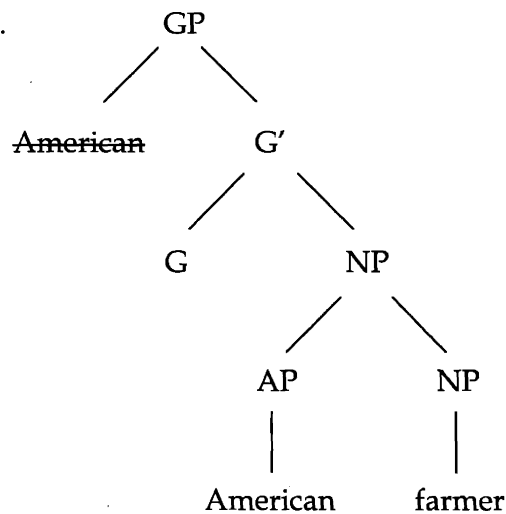
- (52) a ... [... [...]_F ...]_G...
- b. ... [...]_G ...

F-marking would therefore always be dominated and licensed by G-marking its scope of focus. Some analogue of this representation must be present in the syntax in order for the phonology to interpret it. One possibility is that G and F are functional heads selecting arguments that are given and focussed, respectively. Another, more limiting and therefore more interesting, possibility is that there is no functional head F. The functional head G would take a given constituent as its argument and a focussed constituent as a specifier that might or might not raise overtly. These two possibilities are shown in (53).

(53) a.



b.



The debate over these two types of representations of course goes back to Jackendoff (1972) and Chomsky (1976)¹⁷, with many arguments advanced on both sides. The representation in (53a) is more flexible, but it is for that reason less interesting. The fact that focus must be dominated and licensed by givenness is essentially a stipulation under this representation. The

¹⁷ Chomsky (1976) is usually interpreted as advocating an LF-raising representation of focus.

representation in (53b) accounts for this asymmetry. I will therefore adopt (53b) as a working hypothesis. Specifically, I will use (53b) as representative of a constituent in which one constituent is focussed, and the remainder of the constituent containing it is given. This makes explicit F-marking (and “G-marking”) unnecessary, since they are simply the specifier and the complement respectively of the functional head G.

3 FÓCUS and *GÍVEN in Chichewa, Japanese, and Hungarian

3.1 Truckenbrodt (1995)

Truckenbrodt's 1995 dissertation takes up Rooth's conjecture, quoted in §2.3.2, that the *scope* of a focus is phonologically relevant. Truckenbrodt prefers the term *domain of focus* (noted DF) "since *scope* is essentially a semantic notion." He posits the constraint shown in (54).

- (54) Focus: If F is a focus and DF is its domain, then the highest prominence in DF will be within F.

I will refer to this constraint as FÓCUS (pronounced "stress focus") to avoid any possible confusion with the concept of focus itself. An example from Truckenbrodt (1995) is shown in (55). I have supplied the phonological constituents and the intonational tier.

- (56) *Chichewa*
- a. (Anaményá nyumbá ndí mwáála)_φ
 'He hit the house with a rock.'
- b. (Anaményá nyuúmba_F)_φ (ndí mwáála)_φ
 'He hit the *house* with a rock.'

Japanese

- c. (Nágoya de)_φ (Mári ní átta)_φ
 'I met Mary in Nagoya.'
- d. (Nágoya_F de Mári ní átta)_φ
 'I met Mary in *Nágoya*.'

Observations:

- The unfocussed Chichewa and Japanese sentences have essentially the same syntax. See §1.4.
- The unfocussed Chichewa sentence (56a) is contained in a single phonological phrase, while the focussed sentence (56b) is split between two phonological phrases.
- In Japanese, exactly the opposite pattern obtains: the unfocussed sentence (56c) is split between two phonological phrases, while the focussed sentence (56d) is contained in a single phonological phrase.
- The phrasing of the Chichewa sentences affects the vowel length and tonal pattern of *nyumbá* vs. *nyuúmba* 'house.'

In Chapter One, we saw how the different phrasings of the unfocussed Chichewa sentence (56a) and the unfocussed Japanese sentence (56c) are the result of the different rankings in Chichewa and Japanese of the constraints STRESSXP and WRAPXP, as shown in (57).

- (57) *Chichewa*: WRAPXP >> STRESSXP
Japanese: STRESSXP >> WRAPXP

Now let us examine the effects of Truckenbrodt's FOCUS constraint on the focussed versions (56b) and (56d). First, however, we need to consider the constraints that govern headedness in these languages. In the analyses presented in Chapter One, the heads of phonological phrases were assumed to be right in Chichewa and left in Japanese. Since these constraints can be violated in both languages when focus is involved, we need to invoke them directly. I will formalize them as shown in (58), with the rankings shown in (59).

- (58) HEAD(Φ , L) Phonological phrases are left-headed.
HEAD(Φ , R) Phonological phrases are right-headed.

- (59) *Chichewa*: HEAD(Φ , R) >> HEAD(Φ , L)
Japanese: HEAD(Φ , L) >> HEAD(Φ , R)

Strangely, it appears that *intonational* phrases are right-headed, not only in Chichewa, as might be expected, but also in Japanese.¹⁸ This can be formalized by the constraints in (60), with the tentative ranking in (61).

- (60) HEAD(I, L) Intonational phrases are left-headed.
HEAD(I, R) Intonational phrases are right-headed.

- (61) *Chichewa and Japanese*: HEAD(I, R) >> HEAD(I, L)

The overall rankings for Chichewa and Japanese are shown in (62) and (63), respectively. The lowest ranked constraints are not shown.

(62) *Chichewa*

FÓCUS, HEAD(Φ , R) >> WRAPXP >> STRESSXP

(63) *Japanese*

FÓCUS, HEAD(Φ , L), HEAD(I, R) >> STRESSXP >> WRAPXP

Tableaux for the focussed sentences in (56) are shown in (64).

¹⁸ In Truckenbrodt (1995), it is the utterance, rather than the intonational phrase, that is right-headed. The examples here consist of a single intonational phrase, and a right-headedness effect is observable, so I have attributed this to HEAD(I, R) rather than HEAD(U, R).

(64) *Chichewa*

[VP [VP Anaményá [NP nyuúmba _F]] [PP ndí mwáála]] _{DF} 'He hit the <i>house</i> with a rock.'	FÓCUS	HEAD(Φ, R)	WRAPXP	STRESSXP
<p style="text-align: center;">*</p> <p style="text-align: center;">(*)I</p> <p>a. (anaményá nyumbá ndí mwáála)_φ</p>		*!		*
<p style="text-align: center;">*</p> <p style="text-align: center;">(* *)I</p> <p>☞ b. (anaményá nyuúmba)_φ (ndí mwáála)_φ</p>			*	

Observations:

- Both candidates satisfy FÓCUS since the focus *nyuúmba* 'house' is most prominent in its domain of focus, in this case the VP. Note that the focus and the domain of focus are marked F and DF, respectively.
- The two phrasings affect both the vowel length and tonal pattern of *nyumbá* (64a) vs. *nyuúmba* (64b).
- (64a) violates HEAD(Φ, R) since the head *nyumbá* is not rightmost in its phonological phrase.
- (64b) satisfies HEAD(Φ, R) since the head *nyuúmba* is rightmost in its phonological phrase.
- (64b) has a violation of WRAPXP, since the entire VP is not contained in a single phonological phrase. This violation was fatal in the tableau in §1.4, where focus was not involved.
- (64a) has a violation of STRESSXP, since the PP *ndí mwáála* 'with a rock' does not contain the head of a phonological phrase.

(65) Japanese

[VP [PP Nágoya _F de] [VP [PP Mári ní átta]]] _{DF} 'I met with Mary in Nagoya.'	FÓCUS	HEAD(Φ, L)	HEAD(L, R)	STRESSXP	WRAPXP
* (*) _I a. (Nágoya de Mári ní átta) _φ				*	
* (* *) _I b. (Nágoya de) _φ (Mári ní átta) _φ			*!		*
* (* *) _I c. (Nágoya de) _φ (Mári ní átta) _φ	*!				*

Observations:

- (65c) violates FÓCUS, since the focus *Nágoya* is not most prominent in its domain of focus, the VP.
- (65b) violates HEAD(L, R), since the intonational phrase in (65b) is left-headed rather than right-headed.
- The winner (65a) violates STRESSXP, since the NP *Mári* is not the head of a phonological phrase. This violation was fatal in the tableau in §1.4, where focus was not involved.
- The effect of this ranking of constraints is that, unlike the unfocussed version, the focussed sentence must be contained in a single phonological phrase. Descriptively, we could say that focus deletes the phonological phrase boundary that normally follows it.

3.2 Kenesei and Vogel (1993)

We saw in the previous section how focus can tend (descriptively) to delete phonological phrase boundaries, as in Japanese. Truckenbrodt's FOCUS constraint accounts for this in terms of conflicting headedness of phonological constituents. Kenesei and Vogel (1993) observe that such deletion also occurs in languages with a single headedness parameter. We will turn to the primary language they examine, Italian, in Chapters Four and Five. In this section, we will examine Hungarian, which like Italian has a single headedness parameter. In Italian, heads are uniformly right; in Hungarian, they are uniformly left. Thus the first syllable is always stressed in a lexical word¹⁹, and the first prosodic word of a declarative sentence is the most prominent.²⁰ (Kenesei, Vago, and Fenyvesi 1998)

A striking phenomenon of Hungarian is that, descriptively, the prosodic effect of focus is not promotion of the focus itself, but demotion of the constituents following the focus. An example from Kenesei and Vogel (1993) is shown in (66). A word-sandhi phenomenon that Kenesei and Vogel use as a diagnostic of phonological phrase boundaries is L-assimilation,²¹ in which a word ending with /l/ followed in the same phonological phrase by a word beginning with /j/ may assimilate to the /j/.²²

Note that length is denoted in Hungarian orthography by an acute accent, which does not affect stress.

¹⁹ Prosodic words may not have initial stress if they begin with clitics, such as the determiner *az*.

²⁰ Questions have a different pattern.

²¹ Kenesei and Vogel call this 'L-palatalization'. This term, in my opinion, should be reserved for the palatalization of /l/ to /ʎ/, which can also occur in this environment.

²² I must report that my Hungarian language consultant (PC) does not get the L-assimilation contrasts that Kenesei and Vogel assert. For PC, L-assimilation is always possible and never mandatory in continuous speech.

(66) a. *No focus*

*
 (* * *)_I
 (*_φ (*)_φ (* *)_φ
 (*_w (* *)_w (* * *)_w (* * *)_w
 Pá[l] játszik az angol[j] játékkal.

Paul plays the English toy.with

'Paul is playing with the English toy.'

b. *Focus on Pál 'Paul'*

*
 (* * *)_I
 (* * *)_φ
 (* * *)_w (* * *)_w (* * *)_w
 Pá[j] játszik az angol[j] játékkal.

Paul plays the English toy.with

'It is Paul who is playing with the English toy.'

Observations:

- * The focus, *Pál*, has the same stress in (66b) as in (66a). The rest of (66b), however, has reduced stress in comparison to (66a).
- In (66a), the sentence contains three phonological phrases; in (66b) it contains only one.
- The verb *játszik* 'plays' cliticizes to the focus *Pál* in (66b), but not in (66a), where it is not only a prosodic word, but a phonological phrase.
- The DP *az angol játékkal* 'with the English toy' does not form a phonological phrase in (66b), in contrast to (66a).
- In (66a), assimilation of /l/ to a following /j/ is possible in *angol* 'English' but not in *Pál* 'Paul.'
- In (66b), assimilation is possible in both *angol* and *Pál*.

Kenesei and Vogel give the following rule to account for the difference in phrasing between (66a) and (66b):

(67) *Focus Restructuring Rule: Hungarian*

If some word in a sentence bears focus, place a PPh [phonological phrase] boundary at its left edge and join it into a single PPh with all the PPhs on its right.

Except for the cliticization of the verb, we can see that this rule indeed accounts for the difference in phrasing in (66). We will examine Kenesei and Vogel's approach in much more detail in Chapter Five.

3.3 The Prosody of Focus and Givenness in Hungarian: An OT Approach

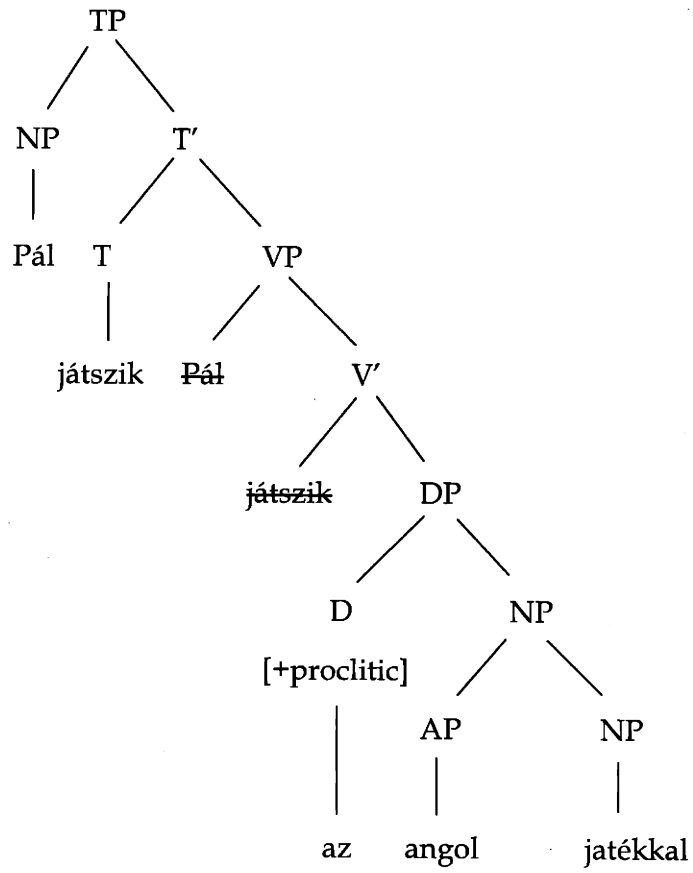
My method here, which I follow in the rest of this dissertation, will be, first, to give the syntax of each sentence, second, to give the constraints governing the formation of prosodic constituents in the absence of focus, including the constraints specifying the mapping from syntactic to prosodic constituents, and third, to add a single additional constraint to account for the effects of focus and givenness.

Following the conclusions of Chapter Two, I will assume that focus is represented in the syntax by a functional head traditionally called F, but which I will call G, to which a focus moves, covertly in some languages, but overtly in the language we are examining here, namely Hungarian. I will also assume that certain functional heads have the morpho-syntactic feature [+proclitic] or [+enclitic] which requires that they cliticize onto the word to their left or right as

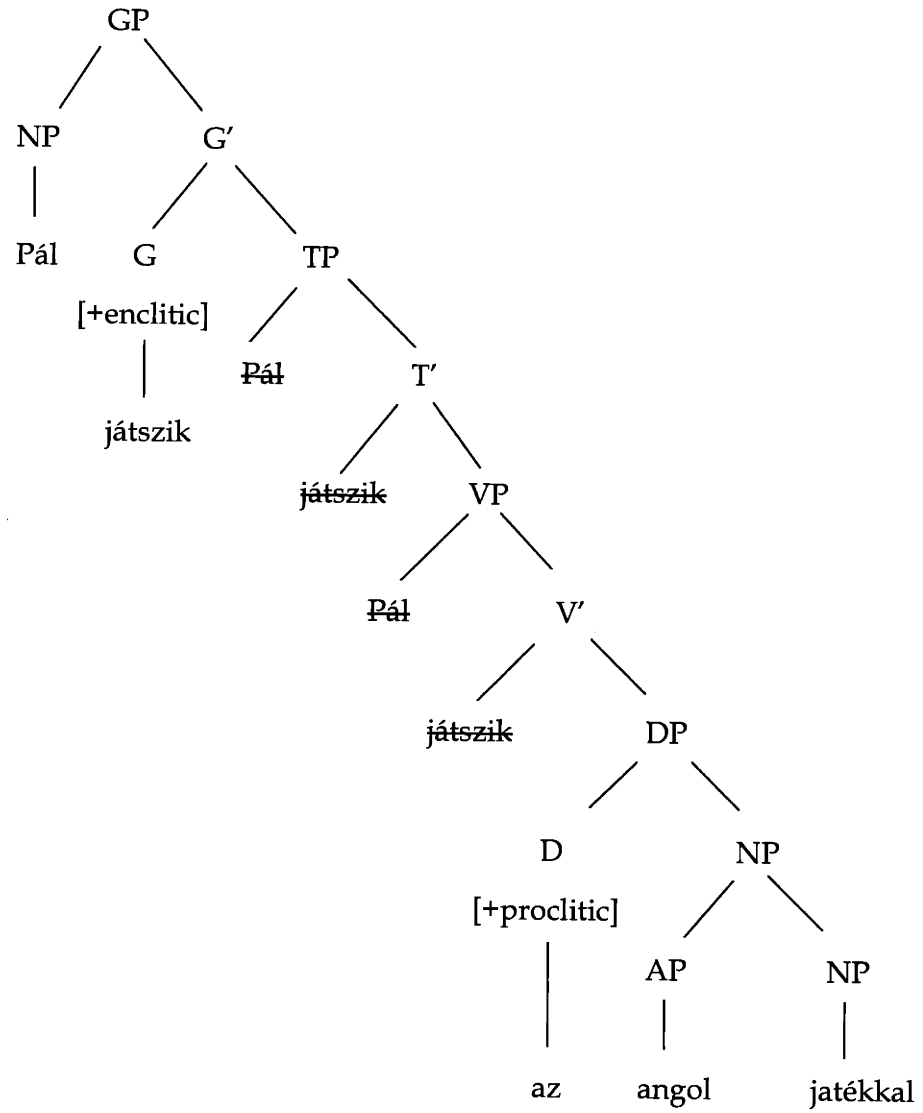
the case may be. This analysis will not be controversial for the proclitic determiner *az* 'the'. Suppose the functional head G had the feature [+enclitic]. The finite verb moves to this head and merges with it, forming a complex head with the feature [+enclitic]. If the constraint LEAN hypothesized below is highly ranked in Hungarian, this would account for the cliticization of the finite verb to the focus in focussed sentences like (66b).

Trees for the focussed and unfocussed versions of the sentence in (66) are given in (68) and (69).

(68) *Pál játszik az angol játékkal.* 'Paul is playing with the English toy.'



(69) Pál játszik az angol játékkal. 'It is Paul who is playing with the English toy.'



3.3.1 Phonological Phrase Formation: The Unfocussed Case

A very tentative list of the constraints governing the formation of prosodic constituents in Hungarian is given in (70).

- (70)
- | | |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| HEAD(L) | Heads of phonological constituents are to the left. |
| WRAPXP | The maximal projection of each lexical head is contained in a single phonological phrase. |
| LÉX(<i>w</i>) | Each lexical head is the head of a prosodic word. |
| LÉX(φ) | Each lexical head is the head of a phonological phrase. |
| LEAN | The morpho-syntactic features [+proclitic] and [+enclitic] are satisfied in the phonology, i.e. a syntactic head with the feature [+proclitic] is neither rightmost in a prosodic word nor its head; a syntactic head with the feature [+enclitic] is neither leftmost in a prosodic word nor its head. |

WRAPXP of course is one of the constraints introduced in Chapter One. Normally, it would be ranked vis-à-vis STRESSXP as in our analyses of Chichewa and Japanese. LÉX(φ) is needed here rather than STRESSXP to account for the fact that the verb is in its own phonological phrase in (66a). STRESSXP only requires that each lexically headed XP contain the head of a phonological phrase. LEAN should perhaps be analyzed into several separate constraints, but there is no evidence for this in Hungarian. The ranking of these constraints is shown in (71).

- (71) LEAN >> HEAD(L) >> LEX(*w*) >> WRAPXP >> LÉX(φ)

LEAN requires that lexical words with the morpho-syntactic feature [+proclitic] or [+enclitic] be clitics phonologically. Lexical words that are not clitics become full prosodic words in order to satisfy $LEX(w)$.

Since LEAN is the most highly ranked constraint here, I will only show candidates that obey it. This means the division of the sentences in (66) into prosodic words, and the assignment of heads of the prosodic words *must* be as shown in (72).

- (72) a. * * * *
 (Pál)_w (játsszik)_w (az angol)_w (játékkal)_w (no focus)
 * * *
- b. (Pál játszik)_w (az angol)_w (játékkal)_w (focus on Pál)

To simplify the tableaux, I will represent e.g. the prosodic word *az angol* as *az.angol* and assume that its head is as shown in (72). Finally, I will not show the constraint LEAN at all in the tableaux, but simply assume that it is satisfied.

HEAD(L) is the second most highly ranked constraint in (71). I will only show candidates that satisfy HEAD(L), except those where a violation is forced by satisfying LEAN. This happens only in the case of proclitics such as the determiner *az*. Since heads will be assumed to be left except in the case of proclitics, I will not show HEAD(L) in the tableaux.

The third ranking constraint is $LEX(w)$. Its interaction with LEAN is also straightforward and will not be shown.

Thus the only remaining constraints are WRAPXP and $LÉX(\varphi)$, and the only remaining candidates are those with the division into prosodic words shown in (72) and with left heads, except where a proclitic would be stressed. These constraints and the candidates for (66a) are shown in (73).

- (73) The unfocussed version of (66).
Heads are assumed to be left, except where a clitic would be stressed.
The division into prosodic words is that given in (72a).

Pál játszik az [angol játékkal] _{NP} Paul is playing with the English toy.	WRAPXP	LÉX(φ)
a. (Pál) _{φ} (játszik) _{φ} (az.angol) _{φ} (játékkal) _{φ}	* !	
b. (Pál) _{φ} (játszik) _{φ} (az.angol játékkal) _{φ}		*
c. (Pál) _{φ} (játszik az.angol) _{φ} (játékkal) _{φ}	* !	*
d. (Pál játszik) _{φ} (az.angol) _{φ} (játékkal) _{φ}	* !	*
e. (Pál játszik) _{φ} (az.angol játékkal) _{φ}		** !
f. (Pál) _{φ} (játszik az.angol játékkal) _{φ}		** !
h. (Pál játszik az.angol) _{φ} (játékkal) _{φ}	* !	**
i. (Pál játszik az.angol játékkal) _{φ}		** ! *

Observations:

- Since the finite verb has moved out of VP, the only lexically headed XP containing more than one word is the NP *angol játékkal* 'English toy.' This NP must be contained in a single phonological phrase to satisfy WRAPXP. Thus WRAPXP is satisfied in (73b, e, f, i) but violated in (73a, c, d, h).
- LÉX(φ) requires that each lexical word contain the head of a phonological phrase. Whenever a phonological phrase contains more than one lexical word, LÉX(φ) will be violated by each of the words except the head, i.e. the leftmost word. Thus (73e), (Pál játszik) _{φ} (az.angol játékkal) _{φ} contains two violations of LÉX(φ) since the lexical words *játszik* 'plays' and *játékkal* 'toy' are not the heads of phonological phrases.

3.3.2 Phonological Phrase Formation: The Focussed Case

Now let us consider how the focussed sentence in (66b) is to be phrased. The null hypothesis must be that no additional constraints are required. This might be thought absurd, but consider two salient facts about focus in Hungarian. First, focus is represented in the overt syntax. So there might be no need at all for focus to be represented in the phonology by a special focus-related constraint about relative prominence. Second, as argued in the previous section, focus introduces a [+enclitic] feature into the morpho-syntax, requiring the finite verb to cliticize to the focus. This requirement is the result of the high ranking of the constraint LEAN, which we have already invoked. So it could be that LEAN produces whatever prosodic effects are not due to the change in the overt syntax.

Nevertheless, the null hypothesis is not correct, as shown by the tableaux in (74).

- (74) The focussed version of (66).
Heads are assumed to be left, except where a clitic would be stressed.
The division into prosodic words is that given in (72b).

[Pál játszik _G az [angol játékkal] _{NP}] _{GP} 'It is Paul who is playing with the English toy.'	WRAPXP	LÉX(φ)
a. (Pál.játszik) _{φ} (az.angol) _{φ} (játékkal) _{φ}	* !	*
•* b. (Pál.játszik) _{φ} (az.angol játékkal) _{φ}		**
c. (Pál.játszik az.angol) _{φ} (játékkal) _{φ}	* !	**
d. (Pál.játszik az.angol játékkal) _{φ}		***

Observations:

- *Pál* 'Paul' is in the specifier of GP, hence it is syntactically focussed.
- The verb *játszik* 'plays' is cliticized to the focus.
- As in (73), the NP *angol játékkal* 'English toy' must be contained in a single phonological phrase to satisfy WrapXP.
- LÉX(φ) is violated anytime a lexical word does not contain the head of a phonological phrase. Thus in (74b), LÉX(φ) is violated twice because *játszik* and *játékkal* are not the heads of phonological phrases.
- (74b) is the winner under the constraints shown. Nevertheless, this is wrong. The true winner should be (74d), which is the same as (66b).
- Since heads are left, the focus *Pál* is the most prominent word in the sentence in all four candidates.

Thus, another, focus-related, constraint is needed. This is perhaps not surprising. What is surprising is that this *cannot* be Truckenbrodt's FÓCUS constraint. The reason is that, as we observed above, the focus *Pál* is the most prominent word in all four candidates. Since FÓCUS requires only that the focussed constituent be the most prominent in its domain of focus, it is satisfied by all four candidates, and cannot be used to distinguish between them. To aid the reader in

visualizing this, in (75), I have blown up the tableau in (74) to show all the metrical structure, and the constraint FÓCUS.

- (75) The focussed version of (66), with all metrical structure shown.
The division into prosodic words is that given in (72b).

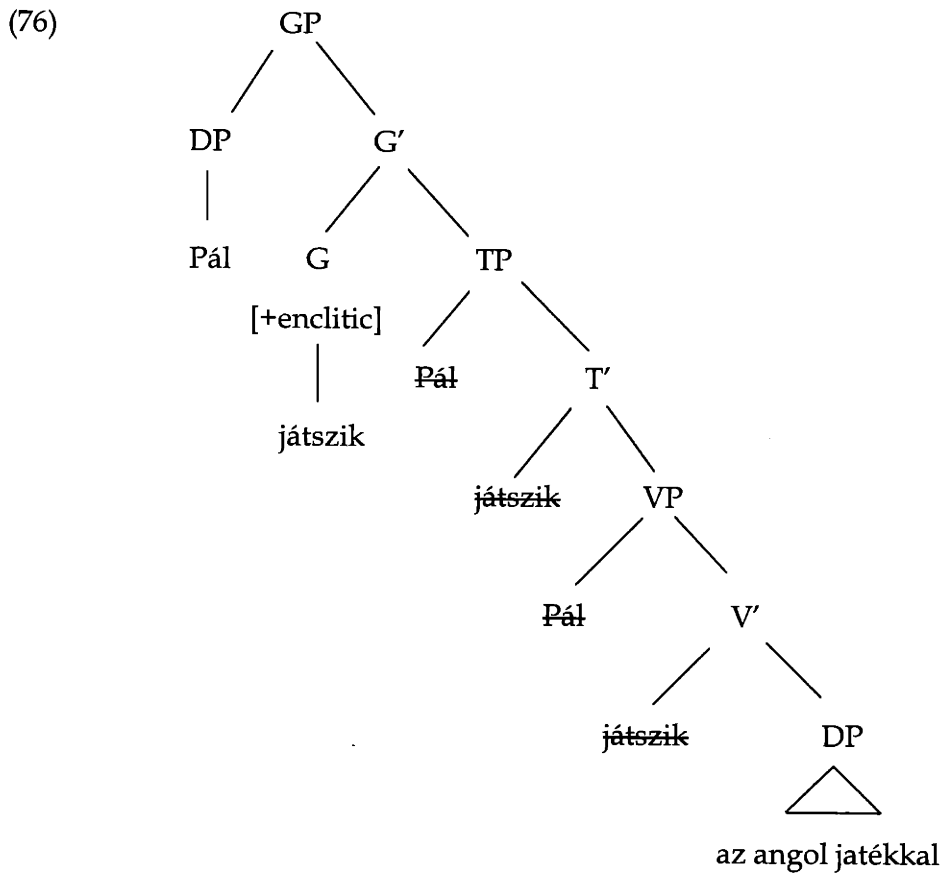
[Pál játszik _G az [angol játékkal] _{NP}] _{GP} 'It is Paul who is playing with the English toy.'	FÓCUS	WRAPXP	LÉX(φ)
* (* * *) _I a. (Pál.játszik) _φ (az.angol) _φ (játékkal) _φ		* !	*
* (* *) _I ●* b. (Pál.játszik) _φ (az.angol játékkal) _φ			**
* (* * *) _I c. (Pál.játszik az.angol) _φ (játékkal) _φ		* !	**
* (*) _I d. (Pál.játszik az.angol játékkal) _φ			***

In (75) we see clearly that FÓCUS cannot distinguish between the candidates, and hence cannot rectify the erroneous choice made under the constraints shown. Again, the true winner here should be (75d), not (75b).

If we try to formulate intuitively what distinguishes (75d) from (75b), it is that in (75d), none of the *unfocussed* words are metrically prominent. Let us formalize this.

3.3.3 The Constraint *GIVEN

Following our discussion in Chapter Two, let us say that a constituent is given if it is part of the domain of focus but is not itself focussed. Since we have overt movement of foci in Hungarian, the given constituent is the remnant of focus movement. Let us return to the tree in (69), repeated here in a slightly more compact form as (76).



The given part of (76) is the remnant of focus movement *including* G, i.e. G'. Since phonological constraints do not normally refer to X' constituents directly, it

is a bit awkward for us to say that a constituent is given iff it is part of G' . I will tentatively suggest that the head in G and the maximal projection that is in the complement of G acquire their status as given constituents separately. That this is the correct interpretation in Hungarian is confirmed by the separate phonological status of the head in G and the maximal projection in the complement of G . The head in G is cliticized to the focus. In other words, it cannot contain the head of a prosodic word. Nothing in the complement of G undergoes cliticization. Nevertheless it is phonologically reduced: it can contain the heads of prosodic words, but not the heads of phonological phrases. With this understanding of the meaning of the term "given", we can formulate the constraint *GÍVEN (pronounced "star stress given") as follows:

(77) *GÍVEN A given constituent is not metrically prominent.

For Hungarian, I propose the rankings in (78).

(78) LEAN >> HEAD(L) >> LÉX(w) >> *GÍVEN >> WRAPXP >> LÉX

As in the previous tableaux for Hungarian, I will assume that LEAN is satisfied throughout and that HEAD(L) and LÉX(w) are satisfied unless this would lead to a violation of LEAN. A tableau for the focussed sentence in (66), with the ranking in (78), is shown in (79).

- (79) The focussed version of (66), with all metrical structure shown.
The division into prosodic words is that given in (72b).

[Pál játszik _G az [angol játékkal] _{NP}] _{GP} 'It is Paul who is playing with the English toy.'	*GÍVEN	WRAPXP	LÉX(φ)
* (* * *) _I a. (Pál.játszik) _φ (az.angol) _φ (játékkal) _φ	* ! *	* !	*
* (* *) _I b. (Pál.játszik) _φ (az.angol játékkal) _φ	* !		**
* (* * *) _I c. (Pál.játszik az.angol) _φ (játékkal) _φ	* !	* !	**
* (*) _I ☞ d. (Pál.játszik az.angol játékkal) _φ			***

Observations:

- Except for the substitution of *GÍVEN for FÓCUS, the tableau in (79) is the same as the one in (75).
- (79a) has two violations of *GÍVEN, since *angol* 'English' and *játékkal* 'toy' are both given, but they are the heads of phonological phrases.
- (79d) has no violations of *GÍVEN and is therefore the winning candidate. This is correct, as we can see from comparing (79d) with (66b).

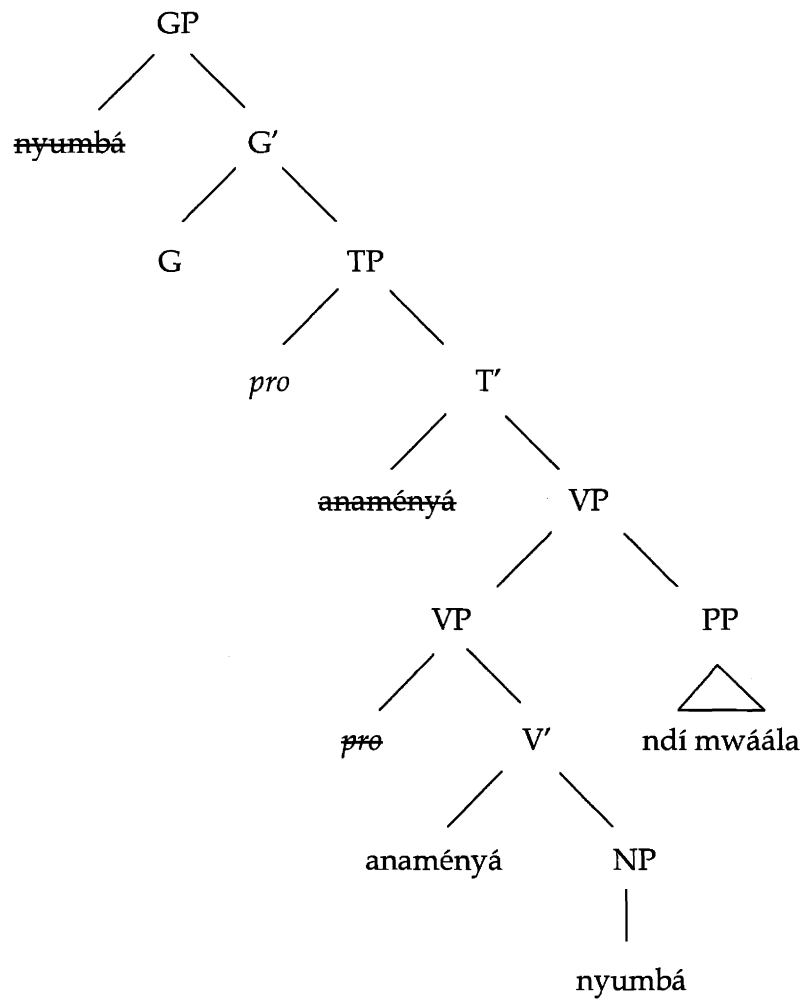
I conclude that *GÍVEN, not FÓCUS, accounts for the prosodic effects of givenness and focus in Hungarian.

3.4 *GÍVEN in Chichewa and Japanese

We have seen that *GÍVEN is needed to account for the prosodic effects of givenness and focus in Hungarian, and that once this constraint is invoked, there is no need for FÓCUS. We had seen previously that FÓCUS does work in Chichewa and Japanese. This suggests that we re-examine these languages to see if *GÍVEN could work just as well. Then we would have a single account for all three languages, and no need for FÓCUS at all.

Our account of Hungarian eliminated F-marking in favor of a functional head G whose complement is given. A constituent moved to the specifier of G is exempt from the interpretation of givenness and is said to be focussed. I would like to suggest very tentatively that the representation of givenness and focus is essentially the same in Chichewa and Japanese, except that in these languages the focus movement is *covert*. In covert movement, the covertly moved word is pronounced in its original location, but it is interpreted in the moved location (Chomsky 1995). Under these assumptions, the focussed versions of the Chichewa and Japanese sentences in (56) would have the syntax shown in (80) and (81).

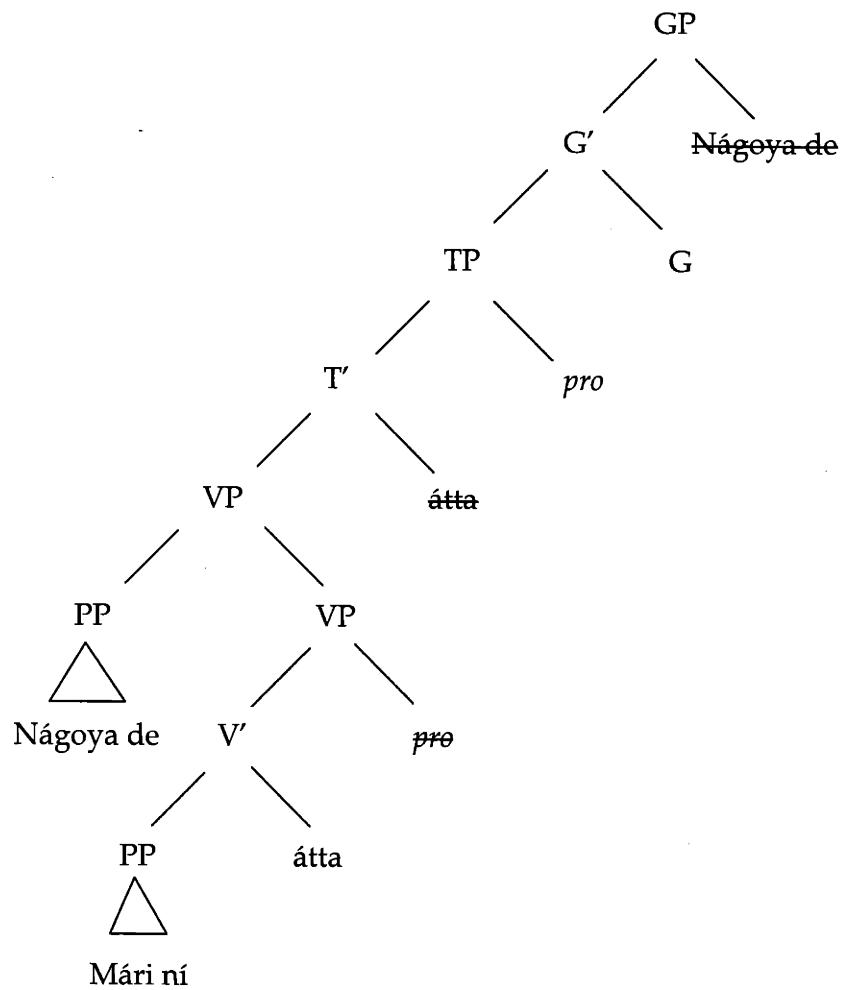
(80) Chichewa



Observations:

- The focus *nyumbá* 'house' is shown raised covertly to the specifier of G.
- Otherwise, the tree is the same as the one in §1.4.

(81) *Japanese*



Observations:

- The focus *Nágoya de* 'in Nagoya' is shown raised covertly to the specifier of G.
- Otherwise, the tree is the same as in §1.4.

Recall from §3.1 that, following Truckenbrodt (1995), we had proposed the following constraint ranking for Chichewa and Japanese:

- (82) a. *Chichewa*
FÓCUS, HEAD(Φ , R) >> WRAPXP >> STRESSXP
- b. *Japanese*
FÓCUS, HEAD(Φ , L), HEAD(I, R) >> STRESSXP >> WRAPXP

Suppose instead we had the rankings shown in (83).

- (83) a. *Chichewa*
HEAD(Φ , R) >> *GÍVEN >> WRAPXP >> STRESSXP
- b. *Japanese*
HEAD(Φ , L) >> *GÍVEN >> STRESSXP >> WRAPXP

Note that in the Japanese ranking in (83), in contrast to (82), HEAD(I, R) does not appear. This analysis therefore makes no use of the assumption that intonational phrases are right-headed in Japanese. The effect of these constraints is shown in the tableaux in (84) and (85).

(84) *Chichewa*

[nyuúmba G [TP [VP anaményá nyuúmba ndí mwáála]]] 'He hit the <i>house</i> with a rock.'	HEAD(Φ , R)	*GIVEN	WRAPXP	STRESSXP
$\begin{array}{c} * \\ (\quad * \quad)_I \\ \text{a. (anaményá nyumbá ndí mwáála)}_\phi \end{array}$		**!		*
$\begin{array}{c} * \\ (\quad * \quad)_I \\ \text{b. (anaményá nyumbá ndí mwáála)}_\phi \end{array}$	*!			*
$\begin{array}{c} * \\ (\quad * \quad * \quad)_I \\ \text{c. (anaményá nyuúmba)}_\phi \text{ (ndí mwáála)}_\phi \end{array}$		*	*	*
$\begin{array}{c} * \\ (\quad * \quad * \quad)_I \\ \text{d. (anaményá nyuúmba)}_\phi \text{ (ndí mwáála)}_\phi \end{array}$		**!	*	*

Observations:

- The focus is *nyuúmba* 'house'. The other words in the sentence are given.
- Placing a grid mark above *nyuúmba* 'house' is permitted. Each grid mark placed anywhere else incurs a violation of *GIVEN. Thus (84a) incurs two violations of *GIVEN since there are two grid marks above *mwáála* 'rock'.

(85) Japanese

[TP [VP [PP <i>Nágoya de</i>] [VP [PP <i>Mári ní</i>] átta]]] G <i>Nágoya de</i> 'I met with Mary in Nagoya.'	HEAD(Φ , L)	*GÍVEN	STRESSXP	WRAPXP
$\begin{array}{c} * \\ (* \quad \quad \quad)_I \\ \text{a. } (Nágoya \ de \ Mári \ ní \ átta)_\phi \end{array}$			*	
$\begin{array}{c} * \\ (* \quad \quad * \quad \quad)_I \\ \text{b. } (Nágoya \ de)_\phi \ (Mári \ ní \ átta)_\phi \end{array}$		*!		*
$\begin{array}{c} * \\ (* \quad \quad * \quad \quad)_I \\ \text{c. } (Nágoya \ de)_\phi \ (Mári \ ní \ átta)_\phi \end{array}$		*!*		*

Observations:

- The focus is *Nágoya de* 'in Nagoya'. The other words in the sentence are given.
- Grid marks above *Nágoya de* are therefore permitted by *GÍVEN. Any grid marks anywhere else are forbidden. Thus in (85c), the two grid marks above *Mári* incur two violations of *GÍVEN.
- No use is made of HEAD(I, R), in contrast to the tableau in (65), where it is crucial.

Thus, although FÓCUS accounts for the prosodic effects of givenness and focus in Chichewa and Japanese, *GÍVEN accounts for them as well. Moreover, the analysis with *GÍVEN makes no use of a constraint that intonational phrases are right-headed in Japanese.

3.5 Conclusions

Both *GÍVEN and FÓCUS can account for the prosodic effects of givenness and focus in Chichewa and Japanese, although the FÓCUS analysis requires us crucially to assume that intonational phrases are right-headed in Japanese, while the *GÍVEN analysis requires no such assumption. However, only *GÍVEN can account for the prosodic effects of givenness and focus in Hungarian. Intuitively speaking what occurs in Hungarian that a FÓCUS analysis cannot account for is the apparently gratuitous de-stressing of given constituents. Once this is understood in Hungarian, we can see that it occurs in Japanese as well.

In our analysis of all three languages, we have only looked at focussed and unfocussed versions of one sentence. Moreover, we have not tried to map out the phrasal phonologies of any of these languages, or tried to analyze how focus and givenness interact with them. Both of these problems will be addressed in our comprehensive analysis of these phenomena in Italian. This is the subject of Chapters Four and Five.

4 The Phrasal Phonology of Italian

Before examining the effects of givenness on the phrasal phonology of Italian, we first need to understand how phonological and intonational phrases are formed in Italian. Two segmental phenomena that will be very useful for this are *raddoppiamento sintattico* ‘syntactic doubling’, which I will use throughout this discussion as a diagnostic for the boundaries of phonological phrases, and *gorgia toscana*, which I will use as a diagnostic for the boundaries of intonational phrases. Italian phrasal phonology has never been studied in an OT framework before, so we will need to examine here it in some detail. However, when we finally turn to givenness effects, the reader will see the fruit of this groundwork. In Chapter Five, we will be able to insert a single constraint, *GÍVEN, into the array of constraints we will deduce here, and have the prosodic phenomena of givenness and focus fall into place.

In both chapters on Italian, I will make frequent use of the impressive collection of data in Frascarelli 2000. Frascarelli recorded a corpus of over 500 sentences, each spoken at three different speeds by fifteen speakers. Thus the total number of recorded utterances was over 20,000. The speakers were from Rome, Florence, and Milan. For a more complete description of the corpus, see Frascarelli 2000, p. 24.

4.1 *Raddoppiamento Sintattico*

Raddoppiamento Sintattico, hereafter RS, is a well-known feature of the prosodic phonology of central and southern dialects of Italian. Descriptively, the facts are as follows: When a word ending in a stressed vowel is followed by a

word in the same phonological phrase beginning with a consonant (but not an obstruent cluster), the consonant geminates, spreading to the coda of the preceding stressed syllable, making that syllable heavy. Examples from Frascarelli (2000) are shown in (86). (I will postpone the question of how the sentences in (86) are parsed into phonological phrases to §4.2.)

- (86) a. (caffé²³ [f:]óрте)_φ
 coffee strong
 ‘strong coffee’
- b. (caffé)_φ ([m]ólto fóрте)_φ
 coffee very strong
 ‘very strong coffee’

Observations:

- *Caffé* ‘coffee’ has a final stressed vowel.
- *Caffé* and the following word are in the same phonological phrase in (86a), but not in (86b).
- The initial consonant of the word following *caffé* geminates in (86a), but not in (86b).

Metrical representations of the sentences in (86) are given in (87). For an explanation of the notation and theory of metrical representation, see Chapter One.

²³ I will always mark Italian word stress with an acute accent. This is in effect a supplement to normal Italian orthography, in which an accent (grave or acute) always denotes word stress, but stress is not always marked. I especially wish to call the reader’s attention to monosyllabic functional heads which are full prosodic words, for which stress is seldom marked in Italian orthography, such as *ho*, the 1.sg. auxiliary, which I will write *hó* (cf. *hó* [v:]ísto, ‘I have seen’), as

- Association lines may cross prosodic word boundaries, as we see when the association line for [f] crosses the boundary between the prosodic words *caffé* and *forte* in (87a).
- Association lines do **not** cross phonological phrase boundaries. RS is blocked between *caffé* and *molto* in (87b) because a phonological phrase boundary intervenes between them.

If an obstruent cluster²⁴ follows the stressed final vowel, instead of geminating, it simply splits, with the first obstruent syllabifying with the preceding word. An example from Chierchia (1986) is shown in (88).

- (88) cittá spórca ⇒ (cit.tás)_w (pór.ka)_w
 *cittá [s:]pórca ⇒ *(cit.tás)_w (spór.ka)_w
 city dirty
 'dirty city'

Finally, there is another *raddoppiamento* phenomenon which is seldom discussed in the generative literature. RS, as we have seen it up until now, has concerned a word-final stressed open syllable followed by a word beginning with a consonant. It turns out that when a word-final stressed *closed* syllable²⁵ is followed in the same phonological phrase by a word beginning a *vowel*, what Chierchia (1986) calls 'backwards' RS occurs. Examples from Chierchia (1986) are shown in (89).

²⁴ Strictly, this should be "[–cont] cluster", to include cases like *pneumático* 'pneumatic'.

²⁵ Of course, Italian words seldom end in closed syllables, which is undoubtedly why this aspect of RS has often been overlooked.

- (89) a. trá[m:] elétrico ⇒ (trá[m])_w ([m]elétrico)_w
 ‘electric tram’
- b. bazá[r:] apérto ⇒ (bazá[r])_w ([r]apérto)_w
 ‘open bazaar’
- c. hoté[l:] elegánte ⇒ (hoté[l])_w ([l]elegánte)_w
 ‘elegant hotel’
- d. mánage[r] elegánte ⇒ (mánag[e])_w ([r]elegánte)_w
 ‘elegant manager’
- e. álco[l] etílico ⇒ (álc[o])_w ([l]etílico)_w
 ‘ethyl alcohol’

Observations:

- The final syllable of the first word must be stressed (89a, b, c) vs. (89d, e) for gemination to take place.
- The final consonant of the first word syllabifies with the first syllable of the second word *whether or not gemination takes place*. What varies is whether it continues to syllabify with the *first* word or not (89a, b, c) vs. (89d, e).
- As with normal RS, the effect of ‘backwards’ RS is to make the final stressed syllable heavy without lengthening the vowel (89a, b, c). The final syllables of (89d, e) need not be heavy because they are unstressed.

4.1.1 Previous Formalizations of *Raddoppiamento Sintattico*

4.1.1.1 Nespor & Vogel (1986), Frascarelli (2000)

Nespor & Vogel (1986) state the rule governing RS as shown in (90), and Frascarelli (2000) adopts it without modification.

(90) $C \Rightarrow [+long] / [... [... V_{[+DTE]}^{26}]_w [___ [+son, -nas] \dots]_w \dots]_\phi$

This rule does not account for backwards RS, as in *trá[m:] elétrico* (89a). The first word here does not end with a vowel, nor does the second word begin with a consonant, so the rule in (90) cannot apply.

4.1.1.2 Chierchia (1986)

Chierchia analyzes RS in the framework of Lexical Phonology (Kiparsky 1982), drawing in addition on the work of Steriade (1982) on syllabification. In this derivational framework, a phonological rule may be designated as applying lexically, post-lexically, or phrasally. Lexical rules apply cyclically, as morphemes are added to the root, and are subject to the Elsewhere Condition, which states that, on each cycle, more specific rules block the application of more general ones.²⁷ Chierchia hypothesizes that rules may have multiple designations, e.g. applying lexically and phrasally, but not post-lexically.

²⁶ By [+DTE], Nespor and Vogel mean word stress.

²⁷ The Elsewhere Condition is, in my opinion, a tautology, since its opposite is a logical impossibility. If more general rules blocked the application of more specific rules, the latter would never apply.

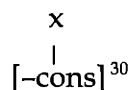
“Conditions” are a special type of rule that applies everywhere, though they may be blocked by the Elsewhere Condition, which is thus a meta-condition. Chierchia adopts the representational convention of “x-slots”, which may be thought of as abstractions of locations to which segmental features may attach.

Given these assumptions, Chierchia proposes that RS (including backwards RS) is due to four rules and/or conditions, which are given in (91).

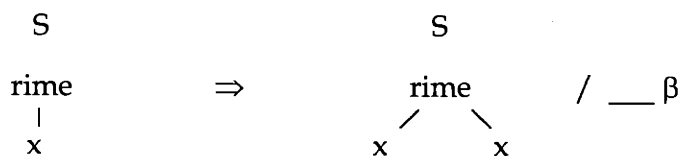
(91) a. Autosegmental Association

Associate x-slots with segments going left to right.²⁸

b. Short Vowel Proviso²⁹ (to Autosegmental Association)

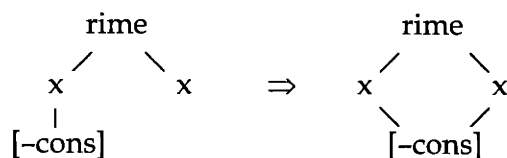


c. Strong Rime Condition (applies non-finally only)



where S indicates word stress and β is non-zero.

d. Empty Nucleus Convention



²⁸ There are additional conditions on Autosegmental Association that are not important here.

²⁹ Chierchia does not give it this name, but he does refer to it as a “proviso.” I take the Short Vowel Proviso to mean “Associate each vowel with one and only one x-slot.”

³⁰ A [-cons] segment of course is simply a vowel.

Chierchia claims that all of these conditions, etc., belong to Universal Grammar, with the exception of the Short Vowel Proviso (91b), which is particular to Italian.

The conditions under which the rules apply and the ways in which, according to Chierchia, they block each other, are quite complex. Chierchia's analysis relies crucially on his claim that the Short Vowel Proviso blocks the Empty Nucleus Convention by the Elsewhere Condition. In fact, the reverse should be true, since the Short Vowel Proviso is the more general of the two rules, if indeed it is a rule at all, in the sense of a rule that could block another "elsewhere."

4.1.2 An Optimality Theoretic Analysis of *Raddoppiamento Sintattico*

Like all phonological alternations in Optimality Theory, *raddoppiamento sintattico* is the result of conflicting constraints. Each of these is in fact stated clearly, if informally, in Chierchia's (1986) rule-based account. On one hand, final vowels are short in Italian. On the other hand, stressed syllables are heavy. The question then naturally arises, What happens if a final vowel is stressed? This question has different answers in different dialects of Italian. In Optimality Theory, such different "answers" correspond to different constraint rankings. The constraints that are relevant here are shown in (92).

- (92) *V:# Final vowels are short.
 HÉAVY Stressed syllables are heavy.
 LEXSTRESS Lexical stress is respected.
 *SANDHI(*w*) Association lines do not cross prosodic word boundaries.
 *SANDHI(φ) Association lines do not cross phonological phrase boundaries.

The ranking of these constraints in central and southern dialects of Italian is shown in (93).

- (93) *V:#, LEXSTRESS, *SANDHI(φ) >> HÉAVY >> *SANDHI(*w*)

Tableaux for the phrases in (86) are shown in (94) and (95).

(94)

caffé forte 'strong coffee'	*SANDHI(φ)	*V:#	LEX STRESS	HÉAVY	*SANDHI(w)
a. ((kaf:é) _w (fórte) _w) φ				* !	
b. ((kaf:é:) _w (fórte) _w) φ		* !			
c. ((káf:e) _w (fórte) _w) φ			* !		
☞ d. ((kaf:éf) _w (fórte) _w) φ					*

Observations:

- [kaf:é] and [fórte] are inside the same phonological phrase.
- (94a) has the lexical form *caffé* unchanged.
- (94b) has the final vowel of *caffé* lengthened.
- (94c) has the stress shifted so we no longer have a final stressed vowel.
- (94d), the winning candidate, has RS applying between [kaf:é] and [fórte].
- (94a) vs. (94d) shows the ranking HÉAVY >> *SANDHI(w), that is, a light stressed vowel is worse than sandhi across a prosodic word boundary.
- (94b) vs. (94d) shows the ranking *V:# >> *SANDHI(w), that is, a final long vowel is worse than sandhi across a prosodic word boundary.
- (94c) vs. (94d) shows the ranking LEXSTRESS >> *SANDHI(w), that is, a violation of lexical stress is worse than sandhi across a prosodic word boundary.

(95)

caffé mólto forte 'very strong coffee'	*SANDHI(φ)	*V:#	LEX STRESS	HÉAVY	*SANDHI(w)
a. ((kaf:é) _w) φ ((mólto) _w (fórte) _w) φ				*	
b. ((kaf:é:) _w) φ ((mólto) _w (fórte) _w) φ		*!			
c. ((káf:e) _w) φ ((mólto) _w (fórte) _w) φ			*!		
d. ((kaf:ém) _w) φ ((mólto) _w (fórte) _w) φ	*!				*

Observations:

- [kaf:é] and [mólto] are in different phonological phrases.
- (95a), the winning candidate, has the lexical form [kaf:é] unchanged.
- (95b) has the final vowel of *caffé* lengthened.
- (95c) has the stress shifted so we no longer have a final stressed vowel.
- (95d) has RS applying between [kaf:é] and [mólto].
- (95a) vs. (95b) shows the ranking *V:# >> HÉAVY, that is, a final long vowel is worse than a light stressed syllable.
- (95a) vs. (95c) shows the ranking LEXSTRESS >> HÉAVY, that is, a violation of lexical stress is worse than a light stressed syllable.
- (95a) vs. (95d) shows the ranking *SANDHI(φ) >> HÉAVY, that is, sandhi across a phonological phrase boundary is worse than a light stressed syllable.

4.1.3 Other Word Sandhi Phenomena in Italian

Before turning to the more complex cases of RS, we need to understand that RS is not the only word sandhi phenomenon in Italian.

The first phenomenon we need to know about is that word-final consonants can syllabify with the following word if it begins with a vowel. This is shown in (96), which repeats the example in (89e).

(96) *álcol etílico* \Rightarrow (*álko*)_w (*letílico*)_w
 ‘ethyl alcohol’

Here we may ask, What is it that permits the lexical word *álcol* to be split between two prosodic words? Why, for that matter, do lexical words ever correspond to prosodic words at all? Recall from Chapter One that Truckenbrodt (1995) proposed that phonological phrases are formed by the interaction of two constraints, STRESSXP, which requires a syntactic maximal projection to contain the head of a phonological phrase, and WRAPXP, which requires that a syntactic maximal projection be contained in a single phonological phrase. I suggest that prosodic words are formed in an exactly analogous way by the interaction of two constraints, STRESSX and WRAPX, which are shown in (97).

- (97) STRESSX A lexical word contains the head of a prosodic word.³¹
 WRAPX For every lexical word *l*, there is a prosodic word *w*
 such that, for all *f*, *f* a feature of *l* which is present in
 the output, *f* is associated with some position in *w*.

Note that WRAPX is not a bar to word sandhi, that is, nothing prevents the features of a lexical word being associated with more than one prosodic word. If word sandhi is barred by a language, it is barred by *SANDHI(*w*), not by WRAPX.

WRAPX is violated in (96), since the segmental features of /álkol/ are not associated with any single prosodic word. STRESSX and WRAPX interact with two other constraints, ONSET, which requires syllables to have onsets, and NOCODA, which bars syllables from having codas (Prince & Smolensky 1993). The syllabification shown in (96) is the result of the constraint ranking in (98), as shown by the tableau in (99).

- (98) STRESSX >> ONSET >> NOCODA >> WRAPX

³¹ For example, STRESSX would be violated if a lexical word were prosodically realized as a clitic.

(99)

álcol etílico 'ethyl alcohol'	STRESSX	ONSET ³²	NOCODA	WRAPX
a. (álkol) _w (etílico) _w		*!	*	
☞ b. (álko) _w (letílico) _w				*
c. (álkol) _w (letílico) _w			*!	
d. (alkoletílico) _w	*!			

Observations:

- (99a) has the prosodic words in one to one correspondence with the lexical words.
- (99b), the winning candidate, has the final [l] of *álcol* re-syllabifying with *etílico*.
- (99c) has the final [l] of *álcol* geminating and spreading to *etílico*.
- (99d) has *álcol* and *etílico* merging into a single prosodic word.
- (99a) vs. (99b) shows the ranking ONSET >> WRAPX, that is, it is worse for a syllable to lack an onset than for a lexical word not to be contained in a single prosodic word.
- (99b) vs. (99c) shows the ranking NOCODA >> WRAPX, that is, it is worse for a syllable to have a coda than for a lexical word not to be contained in a single prosodic word.
- (99b) vs. (99d) shows the ranking STRESSX >> WRAPX, that is, it is worse for a lexical word not to contain the head of a prosodic word than for a lexical word not to be contained in a single prosodic word.

³² One violation of ONSET and one violation of NOCODA are present in the first syllable of *ál.kol*. These are invariant across the candidates and are omitted from the tableau.

The second word-sandhi phenomenon we need to know about is that the first consonant of a word-initial obstruent cluster may re-syllabify with the preceding word, if it ends with a vowel (as most Italian words do). This is shown in (100), which repeats (88).

(100) cittä spórca ⇒ (cit.tás)_w (pór.ka)_w
city dirty
'dirty city'

The relevant constraint here is *CC, which forbids tautosyllabic obstruent clusters. *CC outranks NOCODA. The effect of this ranking is shown in (101).

(101)

cittá spórca 'dirty city'	*CC	NOCODA ³³	WRAPX	*SANDHI(<i>w</i>)
a. (cittá) _w (spórka) _w	*!			
☞ b. (cittás) _w (pórka) _w		*	*	
c. (cittás) _w (spórka) _w	*!	*		*

Observations:

- (101a) has the lexical and prosodic words in a one-to-one correspondence.
- (101b), the winning candidate has the initial [s] of *spórca* re-syllabifying with the preceding word.
- (101c) has the initial [s] of *spórca* geminating and spreading to the preceding word.
- (101a) vs. (101b) shows the ranking *CC >> NOCODA, that is, it is worse for a syllable to contain an obstruent cluster than for one to have a coda.
- (101a) vs. (101c) shows that it does not help to geminate the initial consonant of an obstruent cluster. The violation of *CC is retained, and a violations of NOCODA and *SANDHI(*w*) are added.

³³ There are violations of NOCODA in the first syllables of *cit.ta* and *spor.ka*. These are invariant across the candidates and are omitted from the tableau.

4.1.4 More Complex Cases of *Raddoppiamento Sintattico*

Now we are ready to tackle the following questions:

- How is RS affected by final consonants?
- How is RS affected by obstruent clusters?

We will see that no additional constraints are needed. The constraints demonstrated so far account for all the interactions. The ranking of the relevant constraints is:

(102) ONSET, *CC, *V:# >> HÉAVY >> NOCODA >> *SANDHI(*w*), WRAPX

First, let us consider what happens when a word has both final stress (which can trigger RS) and a final consonant (which can trigger re-syllabification to satisfy NOCODA). An example is *trám elétrico* 'electric tram.' A tableau with the relevant constraints is shown in (103).

(103)

trám elétrico 'electric tram'	ONSET	*V:#	HÉAVY	NOCODA ³⁴	*SANDHI(<i>w</i>)	WRAPX
a. (trám) _w (elétrico) _w	* !			*		
b. (trá) _w (melétrico) _w			* !			*
c. (trá:) _w (melétrico) _w		* !				*
d. (trám) _w (melétrico) _w				*	*	

Observations:

- (103a) has the lexical and prosodic words in one-to-one correspondence.
- (103b) has the final [m] of *trám* re-syllabifying with the following word.
- (103c) has the final [m] of *trám* re-syllabifying with the following word **and** the vowel of *trám* lengthening.
- (103d), the winning candidate, has the final [m] of *trám* geminating and spreading to the following word. This is 'backwards' *raddoppiamento*.
- (103a) vs. (103d) shows the ranking ONSET >> *SANDHI(*w*), that is, it is worse for a syllable to lack an onset than for an association line to cross a prosodic word boundary.
- (103b) vs. (103d) shows the ranking HÉAVY >> *SANDHI(*w*), that is, it is worse for a stressed syllable to be light than for an association line to cross a prosodic word boundary. Of course, it is because of this ranking that RS takes place at all.
- (103c) vs. (18d) shows the ranking *V:# >> *SANDHI(*w*), that is, it is worse for a final vowel to be long than for an association line to cross a prosodic word boundary. Again, this ranking is fundamental to RS.

³⁴ Note that one violation of NOCODA is coming from the second syllable of e.let.tri.co. This is invariant across the candidates and is omitted from the tableau.

The winning candidate, (trám)_w (melétrico)_w, in (18d), may be contrasted with (álko)_w (letlíko)_w in (96, 98b). The corresponding losing candidate, (trá)_w (melétrico)_w, in (18b), is no good here because it violates HÉAVY. ‘Backwards’ RS is taking place in the winning candidate here as we see from the fact that the final [m] of *trám* geminates. In contrast, the final [l] of *álcol* simply re-syllabifies in (96, 98b) and does not geminate. The crucial difference between *trám* and *álcol* is of course that *trám* has final stress.

Finally, let us consider the effects of *V:# and HÉAVY on a word ending in a stressed vowel which precedes a word beginning with an obstruent cluster. The tableau in (104) shows what happens when these constraints are added to the tableau in (101) for *cittá spórca* ‘dirty city.’

(104)

cittá spórca (88) ‘dirty city’	*CC	*V:#	HÉAVY	NOCODA ³⁵	WRAPX	*SANDHI(w)
a. (cit:á) _w (spórka) _w	*!	*	*			
☞ b. (cit:ás) _w (pórka) _w				*		*
c. (cit:ás) _w (spórka) _w	*!			*	*	

Observations:

- The winning candidate (104b) re-syllabifies the obstruent cluster without gemination. RS therefore does not take place.
- The winning candidate satisfies HÉAVY through re-syllabification alone, so there is no motivation for RS.
- If RS gemination **did** occur (104c), we would get a violation of *CC.

³⁵ Two violations of NoCoda come from the first syllables of *cit.ta* and *spor.ka*. These are invariant across the candidates and are omitted from the tableau.

4.2 Phonological Phrases in Italian

Phonological phrase formation in Italian has been studied intensively by Nespor and Vogel (1979, 1986, 1989), Ghini (1993), and Frascarelli (2000) among others. At a first approximation, the facts are as follows, which I will state in terms of tendencies: Phonological phrases tend to be right-headed and binary, and to have lexical words as their heads. Subjects and sentential adverbs tend to be set off in their own phonological phrases. Examples from Frascarelli (2000) are given in (105), where Frascarelli frequently uses *raddoppiamento sintattico* (RS) as a diagnostic for phonological phrase boundaries. Recall from the previous section that RS can apply within phonological phrases, but not across phonological phrase boundaries.

4.2.1 Previous Accounts of Phonological Phrasing in Italian

4.2.1.1 Nespor & Vogel (1986)

A phonological phrase Φ , according to Nespor and Vogel (1986), is formed by the following algorithm:

(106) *Phonological Phrase Formation* (hereafter, ϕ -formation)

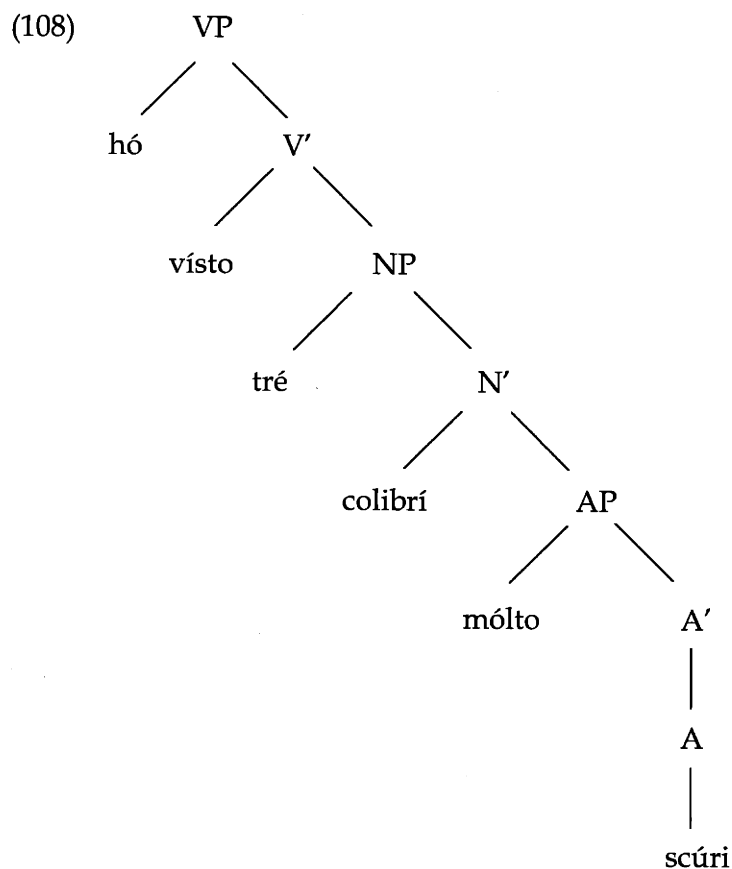
The domain of Φ consists of a C [clitic group] which contains a lexical head X and all the C's on its non-recursive side up to the C that contains another head outside the maximal projection of X.

A few words of explanation are needed here. First of all, the *clitic group* is a phonological constituent that Nespor and Vogel hypothesize as appearing above the prosodic word and below the phonological phrase in the prosodic hierarchy. I will follow Frascarelli (2000) in conflating it, in Italian anyway, with the prosodic word. Secondly, Nespor and Vogel hypothesize that languages with syntactic heads on the left have prosodic heads on the right, and vice versa. I will make no such assumption, and in the case of Italian will simply refer to the “recursive side” as the right and the “non-recursive” side as the left.

Nespor and Vogel offer the following example of their approach (107).

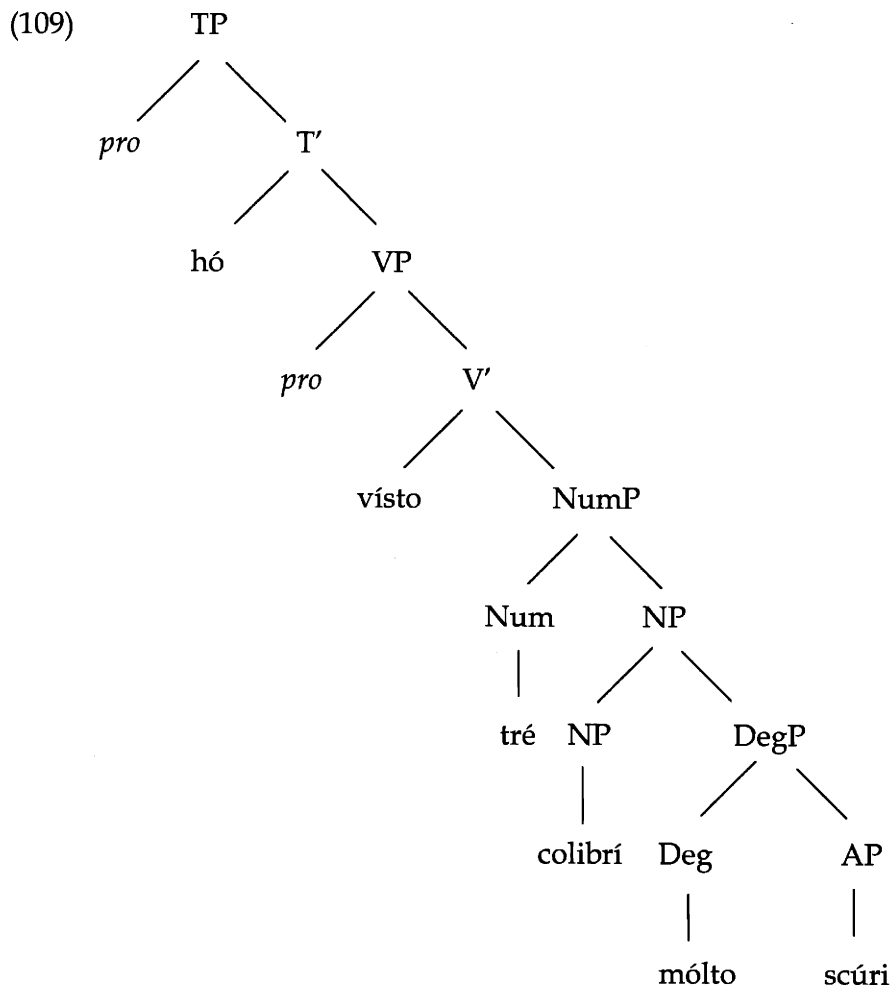
- (107) * * *
(Hó [v:]ísto) $_{\phi}$ (tré [k:]olibrí) $_{\phi}$ ([m]ólto scúri) $_{\phi}$
aux.1.sg. seen three hummingbirds very dark
'I saw three very dark hummingbirds.'

The tree Nespor and Vogel give for the example in (107) is shown in (108).



Parsing the tree in (108) according to the algorithm in (106), we get the phonological phrasing in (107), as required. The correctness of this phrasing is confirmed by the pattern of *raddoppiamento sintattico* shown in (107).

If we bring Nespor and Vogel's syntactic analysis into line with recent syntactic theory, we get a somewhat different picture, as shown in (109).



Tré 'three' is now analyzed as a functional head selecting NP. It differs in position, morphology, and syntax from determiners and from lexical adjectives and nouns. *Mólto* 'very' is also analyzed as a functional head. It differs in position, morphology, and syntax from lexical adverbs. *Mólto scúri* 'very dark' is now analyzed as an adjunct of NP, rather than a complement. Despite these changes, Nespor and Vogel's algorithm still basically works, as long as we understand the phonological phrases formed in (106) to include "all the C's on its

non-recursive side up to the C that contains another [*lexical*] head outside the maximal projection of X.”

4.2.1.2 Phonological Phrase Restructuring

Nespor and Vogel’s rule of ϕ -formation (106) is not the whole story, however. We can see immediately that it does not give correct results on several of the other examples in (105), as shown in (110). The correctness of the phrasing in (110b(i)) is confirmed by the *raddoppiamento sintattico* pattern.

- (110) a. *Phonological phrasing of (105a, d) as predicted by (106).*
- i. (caffé) ([f]orte)
 - ii. (Luígi) (tornerà) (sábato) (séra)
- b. *Correct phrasing of (105a, d).*
- i. (caffé [f:]óрте)
 - ii. (Luígi) (tornerà) (sábato séra)

To address this sort of problem, Nespor and Vogel propose that in (110a(i)) the phonological phrases $(caffé)_\phi$ and $(fóрте)_\phi$ “restructure” into a single phonological phrase, as shown in (110b(i)). The rule for restructuring that Nespor and Vogel (1986) propose is given in (111). (Recall that the “recursive” side is the right side in Italian.)

- (111) *Phonological Phrase Restructuring* (optional: hereafter, ϕ -restructuring)

A non-branching Φ , which is the first complement of X on its recursive side, is joined into the Φ that contains X.

Under current syntactic theory, we would not wish to describe the adjunct *fóрте* 'strong' as the complement of *caffé*. And indeed, in Nespor (1993), cited in Frascarelli (2000), the formulation is changed to "complement or modifier." Reformulated in this way, Nespor and Vogel's formulations of φ -formation (106) and φ -restructuring are empirically adequate, and are adopted by Frascarelli (2000).

4.2.1.3 Ghini (1993)

Ghini (1993) points out two theoretical problems with Nespor and Vogel's approach. Recall that Nespor and Vogel hypothesize a rule of φ -formation (106), which is optionally followed by φ -restructuring (111). Ghini points out that φ -restructuring is in fact required to obtain the unmarked phrasing. *Not* applying restructuring would result in an artificially careful pronunciation. This is the opposite of what we would expect: It should not be necessary to apply an optional rule to obtain the unmarked case.

The second problem Ghini points out is that the syntax/phonology interface is not as simple as it could be under Nespor and Vogel's system. φ -formation has both syntactic and phonological conditions, and φ -restructuring *also* has both syntactic and phonological conditions. Since φ -formation necessarily has syntactic conditions, and since φ -restructuring operates on the output of φ -restructuring, an ideal interface would have the conditions for φ -formation be purely syntactic, and the conditions for φ -restructuring be purely phonological.

Ghini proposes a solution that addresses both of the problems. Like Nespor and Vogel, Ghini proposes a two-step process. However, rather than construct small phonological phrases, and then optionally merging them, Ghini constructs maximal phrases and then subdivides them. His new algorithm is given in (112).

- (112) a. Φ -domain formation
 The domain of Φ formation is delimited by right-edge X^{\max} boundaries.
- b. Φ -formation
 Phonological words included in a string delimited by (a) are distributed according to the principles of
- i. uniformity and average weight
 - ii. symmetry
 - iii. increasing units

Ghini's two-step process remedies both problems he identifies in Nespor and Vogel's analysis. First, it does not require application of an optional rule to obtain an unmarked phrasing. Consider two of the sentences that Nespor and Vogel cite as cases where their algorithm of ϕ -formation fails to give the unmarked phrasing, as shown in (113).

- (113) a. [[I caribú náni]_{DP} sóno estínti]_{TP}
 the caribou dwarf be.3.PL extinct.PL
 'Dwarf caribou are extinct.'

- b. [[Se prenderá qualcosa]_{CP} [prenderá tórdi]_{TP}]_{TP}
 if take.3.SG.FUT. something take.3.SG.FUT. thrushes
 ‘If he catches anything, he will catch thrushes.’

In this case, Ghini’s basic Φ -domain formation rule (112a) gives the unmarked results without having to apply the Φ -formation rule (112b). The former requires that the right edges of maximal projections be aligned with the right edges of phonological phrases. We can see that this indeed gives the unmarked phrasing shown in (114), where *raddoppiamento sintattico* serves to confirm the phrasing.

- (114) a. (I caribú [n:]áni)_φ (sóno estínti)_φ
 b. (Se prenderá [k^w:]alcósa)_φ (prenderá [t:]órdi)_φ

The second advantage of Ghini’s approach is that the syntax/phonology interface is cleaner. We can see that the conditions for Φ -domain formation are purely syntactic in (112a), and the conditions for Φ -formation are purely phonological in (112b). This is preferable to the rules proposed by Nespor and Vogel, in which Φ -formation had both syntactic and phonological conditions, and Φ -restructuring *also* had both syntactic and phonological conditions.

But there are at least two problems with Ghini’s approach. The first is that the theoretical framework is unclear. The principles in (112) have an OT flavor, but Ghini does not present them as ranked and violable constraints. Rather, they license any phrasings that satisfy any of the principles. This rules out a few extreme cases of bad phrasing, but allows too many to be satisfactory empirically.

- c. * * *
 (Porterá)_φ ([k^w]áttro cáni)_φ (alla³⁷ móstra)_φ
 take.fut.3.sg. four dogs to.the show
 ‘He will take four dogs to the [dog] show.’
- d. * * *
 (Luígi)_φ (tornerà)_φ ([s]ábato séra)_φ
 Luigi return.fut.3.sg. Saturday evening
 ‘Luigi will return Saturday evening.’

The formal constraints whose interaction leads to the patterns in (115) are given in (116). The reader will recall that each of these constraints was stated as a “tendency” when these examples were first introduced. It is, in my opinion, one of the advantages of Optimality Theory that it permits us to state our intuitions about phonological phenomena quite directly, while retaining the formal rigor of a rule-based approach.

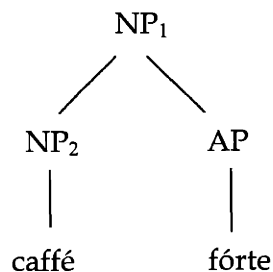
- (116) BIN(ϕ) Phonological phrases are binary.
 LEX(R) The rightmost word in a phonological phrase is lexical.
 HEAD(R) Phonological heads are to the right.
 STRESSXP The maximal projection of a lexical head contains the head of
 a phonological phrase. (Truckenbrodt 1995)

I will hypothesize that, in Italian, these constraints are ranked as shown in (117).

- (117) LEX(R) >> HEAD(R) >> STRESSXP >> BIN(ϕ)

Like previous writers, I will use *raddoppiamento sintattico* (RS) as a diagnostic for phonological phrase formation in Italian. Recall that RS can apply between words within a single phonological phrase, but not across phonological phrase boundaries. In order to understand how the constraints in (116) are optimally satisfied by the phrasing in (115), we of course need to know what the syntax is. At the risk of overkill, in (118), I present trees and tableaux for each of the examples in (115).

(118) a. i. *caffé forte* 'strong coffee'



Observations:

- There are two lexical heads in (118): *caffé* and *forte*, projecting to NP and AP, respectively.
- The AP adjoins to the NP *caffé*, with NP projecting. The maximal projection of the lexical head *caffé* is therefore $[[caffé]_{NP} forte]_{NP}$.
- For the constraint STRESSXP (116) to be satisfied, NP₁ and AP must both contain (not necessarily distinct) heads of phonological phrases.
- *Forte* 'strong' is inside both NP₁ and AP. Making *forte* the head of a phonological phrase will therefore satisfy STRESSXP for both phrases.

³⁷ Note the absence of word stress on *alla* 'to the', which cliticizes to *mostra*, 'show'.

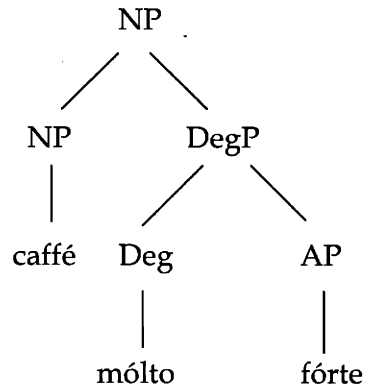
(118) a. ii. *Heads are assumed to be right. Head(R) is not shown.*

café forte 'strong coffee'	LEX(R)	STRESSXP	BIN(φ)
$([k]affé)_\varphi ([f]óрте)_\varphi$			*!*
$\leftarrow ([k]affé [f:]óрте)_\varphi$			

Observations:

- LEX(R) is satisfied by both candidates since the rightmost word in each phonological phrase is lexical.
- STRESSXP is satisfied by both of the candidates, since in both of them *fóрте* 'strong' is the head of a phonological phrase. *Fóрте* is the head of $(café [f:]orte)_\varphi$, since heads are right.
- Errors are counted in terms of the number of prosodic words that do not conform to the constraint. In the case of BIN(φ), this means the number of prosodic words that are not in binary phonological phrases.

(118) b. i. *caffé molto forte* 'very strong coffee'



Observations:

- I have analyzed *molto* 'very' as a functional head Deg(ree) selecting an AP since *molto* is a member of a closed class of words that differ in position and morphology from lexical adverbs.
- There are two lexical heads: *caffé* 'coffee' and *forte* 'strong'.
- The DegP *molto forte* adjoins to the NP *caffé*, with NP projecting. The maximal projection of the lexical head *caffé* is therefore $[[caffé]_{NP} molto forte]_{NP}$.
- As in (118a), making *forte* 'strong' the head of a phonological phrase will satisfy STRESSXP for both lexically headed XP's.

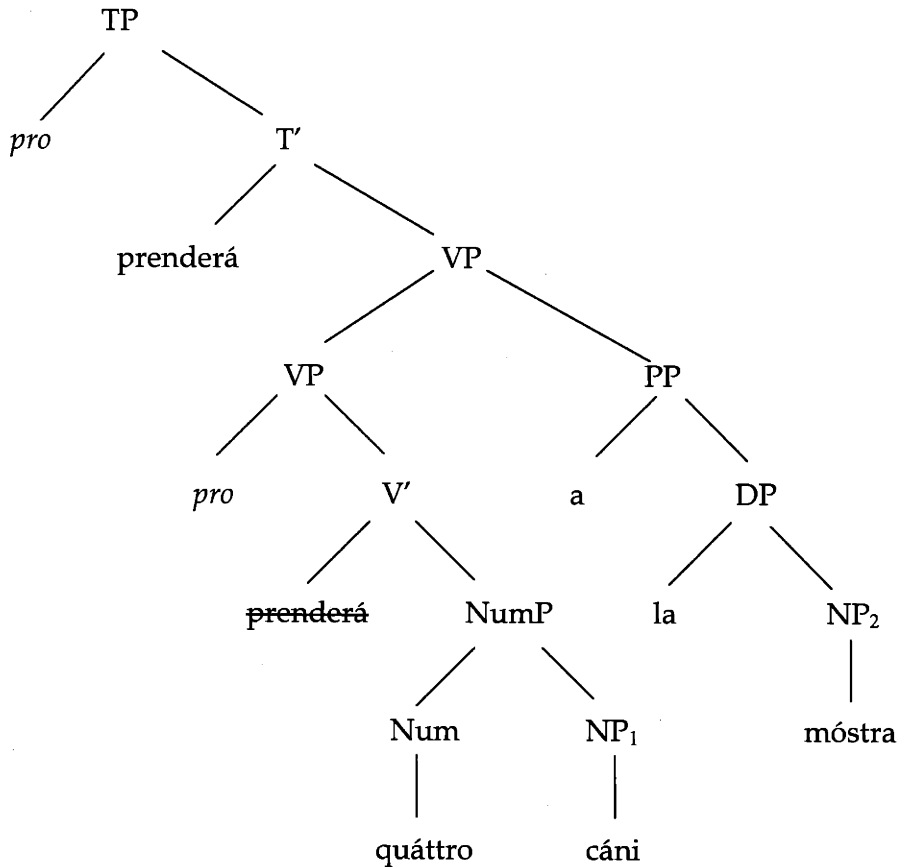
(118) b. ii. *Heads are assumed to be right. Head(R) is not shown.*

caffé molto forte 'very strong coffee'	LEX(R)	STRESSXP	BIN(φ)
(caffé) $_{\varphi}$ ([m]ólto) $_{\varphi}$ (fóрте) $_{\varphi}$	* !		***
(caffé [m:]ólto) $_{\varphi}$ (fóрте) $_{\varphi}$	* !		*
☞ (caffé) $_{\varphi}$ ([m]ólto forte) $_{\varphi}$			*
(caffé [m:]ólto forte) $_{\varphi}$			** ! *

Observations:

- LEX(R) (116) is violated wherever the functional head *molto* 'very' is rightmost in a phonological phrase.
- STRESSXP is not violated here since, as in (118a), *fóрте* is the head of a phonological phrase in all of the candidates.
- *Raddoppiamento sintattico* is shown wherever it would occur.
- The fact that RS actually does not occur here confirms the identity of the winning candidate.

- (118) c. i. *Prenderá quáttro cáni alla móstra.*
 'He will take four dogs to the [dog] show.'



Observations:

- I have analyzed *quáttro* 'four' as a functional head Num selecting an NP, since numerals differ in position, morphology, and syntax from determiners and from lexical nouns and adjectives. LEX(R) will therefore be violated whenever *quáttro* is rightmost in a phonological phrase.
- I have analyzed *alla móstra* 'to the show' as a VP adjunct. The alternative is that it is a argument inside a VP shell. In any case, it is inside the maximal projection of V.

- When the clitics *a* 'to' and *la* 'the (fem.)' combine, they form *alla*, which is itself a clitic, cliticizing here to *móstra* 'show', forming the prosodic word $(alla\ móstra)_w$. The entire prosodic word $(alla\ móstra)_w$ can be, and is, the head of a phonological phrase, but it doesn't make sense to talk about *alla* as the head of a phonological phrase, since it is not a prosodic word on its own.
- There are three lexical heads in (118c (i)), that is, the heads of VP, NP₁ (*cáni*), and NP₂ (*móstra*). STRESSXP requires that the maximal projections of all three contain the heads of phonological phrases. Since the two NP's are inside the maximal projection of V, stressing either of them will also stress VP.

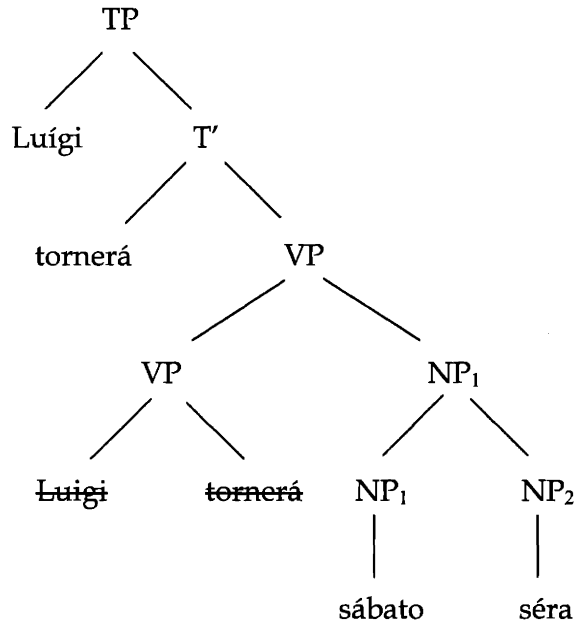
(118) c. ii. *Heads are assumed to be right. Head(R) is not shown.*

Prenderá quáttro cáni alla móstra. 'He will bring four dogs to the show.'	LEX(R)	STRESSXP	BIN(φ)
a. (prenderá) $_{\varphi}$ ([k ^w]áttro) $_{\varphi}$ (cáni) $_{\varphi}$ (alla móstra) $_{\varphi}$	*!		*****
b. (prenderá [k ^w :]áttro) $_{\varphi}$ (cáni) $_{\varphi}$ (alla móstra) $_{\varphi}$	*!		**
☞ c. (prenderá) $_{\varphi}$ ([k ^w]áttro cáni) $_{\varphi}$ (alla móstra) $_{\varphi}$			**
d. (prenderá) $_{\varphi}$ ([k ^w]áttro) $_{\varphi}$ (cáni alla móstra) $_{\varphi}$	*!	*	**
e. (prenderá [k ^w :]áttro cáni) $_{\varphi}$ (alla móstra) $_{\varphi}$			***!*
f. (prenderá) $_{\varphi}$ ([k ^w]áttro cáni alla móstra) $_{\varphi}$		*!	*****
g. (prenderá [k ^w :]áttro) $_{\varphi}$ (cáni alla móstra) $_{\varphi}$	*!	*	
h. (prenderá [k ^w :]áttro cáni alla móstra) $_{\varphi}$		*!	*****

Observations:

- Violations are counted in terms of the number of prosodic words that violate the constraint.
- *Alla móstra* 'to the show' is a single prosodic word, which in this case is always the head of a phonological phrase.
- LEX(R) is violated wherever the functional head *quáttro* 'four' is rightmost in a phonological phrase.
- The winning candidate (*prenderá*) (*quáttro cáni*) (*alla móstra*) violates BIN(φ) since two of its phonological phrases are not binary. (See above for *alla móstra*.) It is nonetheless the optimal candidate, as the tableau shows.
- STRESSXP requires that *cáni* 'dogs' and *móstra* 'show' both be the heads of phonological phrases. See the observations on the tree in (118c (i)).
- (118c (ii)(c)) vs. (118c (ii)(g)) shows the ranking LEX(R) >> BIN(φ).

(118) d. i. *Luígi tornerà sábato séra.* ‘Luigi will return Saturday evening.’



Observation:

- (118d (i)) contains four lexical heads. STRESSXP requires that the maximal projections of all four contain the heads of phonological phrases. However, NP₂ (*séra* ‘evening’) is inside the maximal projection of NP₁ (*sábato* ‘Saturday’). Therefore, if NP₂ contains the head of a phonological phrase, the maximal projection of NP₁ will, too. The result is that only *Luígi*, *tornará*, and *séra* need to be the heads of phonological phrases to satisfy STRESSXP.

(118) d. ii. *Heads are assumed to be right. Head(R) is not shown.*

Luígi tornerá sábato séra. 'Luigi will return Saturday evening.'	LEX(R)	STRESSXP	BIN(φ)
a. (Luígi) $_{\varphi}$ (tornerá) $_{\varphi}$ ([s]ábato) $_{\varphi}$ (séra) $_{\varphi}$			***!*
b. (Luígi tornerá) $_{\varphi}$ ([s]ábato) $_{\varphi}$ (séra) $_{\varphi}$		*!	**
c. (Luígi) $_{\varphi}$ (tornerá [s:]ábato) $_{\varphi}$ (séra) $_{\varphi}$		*!	**
d. (Luígi) $_{\varphi}$ (tornerá) $_{\varphi}$ ([s]ábato séra) $_{\varphi}$			**
e. (Luígi tornerá [s:]ábato) $_{\varphi}$ (séra) $_{\varphi}$		*!*	*****
f. (Luígi) $_{\varphi}$ (tornerá [s:]ábato séra) $_{\varphi}$		*!	*****
g. (Luígi tornerá) $_{\varphi}$ ([s]ábato séra) $_{\varphi}$		*!	**
h. (Luígi tornerá [s:]ábato séra) $_{\varphi}$		*!*	*****

Observations:

- STRESSXP is satisfied only when *Luígi*, *tornerá*, and *séra* all contain the heads of phonological phrases. See the observations on (118d (i)).
- LEX(R) cannot be violated here, since there are no functional heads.
- (118d (ii)(d)) vs. (118d (ii)(g)) shows the ranking STRESSXP >> BIN(φ).
- *Raddoppiamento sintattico* is shown wherever it would occur.

4.3 *Gorgia Toscana*

Gorgia toscana is a consonantal lenition phenomenon that occurs in the Tuscan dialect of Italian. Between sonorants within an intonational phrase, the unvoiced stops /p, t, k/ become [φ, θ, h]. This can occur across word boundaries and even across phonological phrase boundaries. Examples from Frascarelli (2000) are shown in (119).

- (119) a. ((Gio[h]o)_φ (a palla[h]anestro)_φ ([h]on Paolo)_φ ([h]on piacere)_φ)_I
play.1.sg at basketball with Paolo with pleasure
'I play basketball with Paolo with pleasure.'
- b. ((Ho comprato)_φ (una [φ]alla)_φ (per il [θ]uo compleanno)_φ)_I
have.1.sg. buy.pp. a ball for the your birthday
'I bought a ball for your birthday.'

Gorgia toscana (GT) is important for the study of the phrasal phonology of Italian since it can serve as a diagnostic for the location of intonational phrase boundaries. It will occur within a single intonational phrase, but not across an intonational phrase boundary. Frascarelli gives the rule for GT in (120).

$$\begin{array}{ccc}
 (120) \quad [-\text{cont}] & \Rightarrow & [+cont] \\
 & & | \\
 & & [-\text{voice}] \\
 & & | \\
 & & [\dots V C (X) V \dots]_I \quad X = [r, l, j, w]
 \end{array}$$

Observations:

- According to this rule, GT occurs when the consonant is preceded by a vowel and followed by an optional non-nasal sonorant followed by a vowel.
- GT changes a stop to a continuant.
- GT affects only voiceless stops.
- GT occurs only within an intonational phrase, noted here by subscripted I.

Vowels of course are sonorants, so we can simplify the environment following C to [+son, -nas]. Similarly, we observe from Frascarelli's own example (119b) that GT can occur after non-vocalic sonorants, e.g. *il [θ]uo compleanno* 'your birthday,' so presumably the environment preceding C is also better stated as [+son, -nas]. I will not go into the interesting question here of why we get [φ, θ, h] rather than [f, θ, χ]. This would take us too far afield. I will only show why we get continuants in this environment.

Gorgia toscana can be represented in an OT framework³⁸ by a ban on unvoiced stops between non-nasal sonorants, plus a ranking of the faithfulness constraints on different distinctive features. The constraints and the their rankings are shown in (121) and (122).

³⁸ For another OT approach, with many phonetic details and numerous references, see Kirchner (1998).

(121) a. *VCV * $\begin{bmatrix} +\text{son} \\ -\text{nas} \end{bmatrix} \begin{bmatrix} -\text{cont} \\ -\text{voice} \end{bmatrix} \begin{bmatrix} +\text{son} \\ -\text{nas} \end{bmatrix}$ within an intonational phrase.

b. FAITH[voice]³⁹ The value of [\pm voice] is preserved.

c. FAITH[son] " " " [\pm son] " "

d. FAITH[nas] " " " [\pm nas] " "

e. FAITH[cont] " " " [\pm cont] " "

(122) *VCV, FAITH[voice], FAITH[son], FAITH[nas] >> FAITH[cont]

A tableau for *gioco* 'I play' is shown in (123).

(123)

/d3oko/ 'I play'	*VCV	FAITH[voice]	FAITH[son]	FAITH[nas]	FAITH[cont]
d3oko	*!				
d3ogo		*!			
d3okt			*!		
d3okn				*!	
d^{h} d3oho					*

It might appear that I have simply "OT'd" the rule in (120). But the two analyses are not equivalent. The ranking in (122) makes predictions that are not made by the rule in (120).

³⁹ Kager (1999) refers to this class of constraints as IDENT-IO(VOICE), etc.

Consider, for example, the ranking FAITH[voice] >> FAITH[cont]. This ranking predicts that whenever a higher ranked constraint causes one of these features to be changed, in any environment, all other things being equal, it will *always* be the value of [\pm cont] that changes, never the value of [\pm voice]. The rule in (120) makes no such prediction.

4.4 Intonational Phrases in Italian

4.4.1 Nespor and Vogel (1986)

Intonational phrases are the next higher category in the prosodic hierarchy above phonological phrases. Nespor and Vogel (1986: 189) give the following rule for their formation.

(124) *Intonational Phrase Formation*

I. *I domain*

An I domain may consist of

- a. all the ϕ 's in a string that is not structurally attached to the sentence tree at the level of s-structure, or
- b. any remaining sequence of adjacent ϕ 's in a root sentence.

II. *I construction*

Join into an n-ary branching *I* all ϕ 's included in a string delimited by the definition of the domain of *I*.

Nespor and Vogel comment:

As expressed in [124], *I* is isomorphic with any of the constituent types that obligatorily form intonational phrases and with a root sentence if it is not interrupted by an obligatory *I*. When the root sentence does have an intervening obligatory *I*, however, it is often the case that the strings on one or both sides of this *I* are not isomorphic to any constituent in the syntax.

English examples from Nespor and Vogel (1986) and an Italian example from Frascarelli (2000) are shown in (125).

- (125) a. (They have)_I (as you know)_I (been living together for years)_I
b. (He will never)_I (as I said)_I (accept your proposal)_I
c. (Charles wouldn't)_I (I imagine)_I (have done such a thing)_I
d. (Il figlio di mio cugino)_I (come sai)_I (ha studiato in America)_I
the son of my cousin as know.2.sg has studied in America
'My cousin's son, as you know, has studied in America.'

4.4.2 Frascarelli (2000)

Frascarelli (2000) observes that, in addition to parenthetical phrases of the sort in (125), topics are also set off in their own intonational phrases. Italian examples from Frascarelli (2000) are shown in (126). The absence of *gorgia toscana* in the Italian examples shows their division into intonational phrases.

- (126) a. (nella sua casa di Roma)_I ([p]aolo ci va poco spesso)_I
 in.the his house of Rome Paolo there go.3.sg. little often
 'Paolo doesn't often go to his house in Rome.'
- b. (non voglio più uscirci)_I ([k]on gli amici di mio fratello)_I
 not want.1.sg. more go.out with the friends of my brother
 'I don't want to go out with my brother's friends anymore.'

Observation:

- If *gorgia toscana* had applied in (126a, b) we would have gotten [φ]aolo and [h]on for *Paolo* and *con* 'with'.

Frascarelli observes that the topics in the Italian examples in (126) are *branching*, that is, they contain two or more phonological phrases, as shown in (127).

- (127) a. ((nella sua casa)_φ (di Roma)_φ)_I
 b. ((con gli amici)_φ (di mio fratello)_φ)_I

When the topics consist of a single phonological phrase, they may remain a part of the main intonational phrase in rapid speech, as shown in (128).

- (128) a. ((questo libro)_φ ([h]onosco l'autore)_φ (che l'ha scritto)_φ)_I
 this book know.1.sg. the author that it aux.1.sg. write.pp.
 'I know the author who wrote this book.'
- b. (dopo quel giorno)_φ (non l' ho più incontrata)_φ ([h]aterina)_φ)_I
 after that day not her aux.1.sg. more meet.pp.f. Caterina
 'I haven't seen Caterina since that day.'

Frascarelli formalizes this in (129).

(129) a. *Topic Prosodic Domain*

A Topic is minimally and exhaustively contained in an I.

b. *Topic Restructuring*

If non-branching, a Topic may restructure into the adjacent constituent, on either side.

$$\begin{array}{ccccccc} [[\dots]_{\Phi}]_I & [[\dots]_{\Phi} [\dots]_{\Phi} \dots]_I & \Rightarrow & [[\dots]_{\Phi} [\dots]_{\Phi} [\dots]_{\Phi} \dots]_I \\ \text{topic} & \text{sentence} & & \text{topic} \quad \text{sentence} \end{array}$$

With these rules in mind, Frascarelli formulates the following general rules for intonational phrase formation:

(130) *I-Domain*

An I-domain may consist of:

- a. all the Φ s in a string dominated by the Focus Phrase;
- b. any remaining sequence of adjacent Φ s adjoined within the root sentence;
- c. a Topic constituent.

By a Focus Phrase, Frascarelli means the remainder of the sentence after any topics have been extraposed. Frascarelli comments that (130b) “includes all those elements – as Adjunct constituents, parenthetical expressions and unrestrictive relative clauses – which form independent intonative groups.” As with Nespor and Vogel’s formulation, this does not explain which constituents form intonative groups and which do not.

4.4.3 An OT Approach to Intonational Phrase Formation

4.4.3.1 The Syntax of Topics

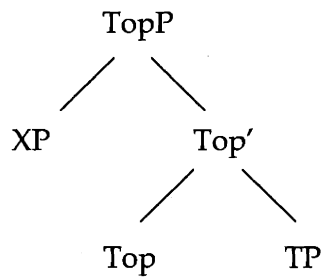
Unlike Nespor and Vogel (1986) and Frascarelli (2000), I will not attempt to give a comprehensive account of intonational phrase formation in Italian. I will concentrate instead on how topic and focus affect intonational phrasing. It will be necessary for us to have a working hypothesis on the syntax of topics. This has been the subject of much debate. Rizzi (1997) hypothesizes that an arbitrary number of topics move to a functional head *Top*, which may appear either above or below or above *and* below a functional head *Foc*, which hosts both foci and *wh*-phrases. Thus, under Rizzi's approach, the syntax of topics is very comparable to the syntax of focus, both of them being A-bar positions.

At the same time, Rizzi points out that there are at least five important differences between topic and focus.

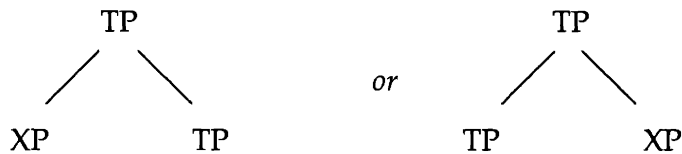
- (131) Differences between Topic and Focus in Italian (Rizzi 1997)
- a. Topics often take "resumptive" clitics; foci never do.
 - b. Foci cause weak cross-over violations; topics do not.
 - c. Bare quantificational elements (e.g. *nessuno* 'no-one') can be focussed; they cannot be topicalized.
 - d. Multiple topics can occur in the purported A-bar position; only one focus can.
 - e. Topicalization is compatible with overt *wh*-movement; focus movement is not.

To these, I would add another, in my opinion even more important difference: topicalization can move a topic to the right of the sentence; focus movement cannot. For all these reasons, but especially the last, rather than accept Rizzi's contention that there are two kinds of A-bar movement, I will hypothesize instead that topicalization is in fact not A-bar movement at all; it is adjunction. These two possibilities are illustrated in (132).

(132) a. *Topic XP in an A-bar position*



b. *Topic XP adjoined to TP*



Observations:

- In (132a), the topicalized phrase XP is in an A-bar position, the specifier of a functional head Top. XP must be on the left if Top is on the left.
- In (132b), the topicalized phrase XP is simply adjoined to the sentential projection TP, with TP projecting. XP can be adjoined on either side.

4.4.3.2 The Formation of Italian Intonational Phrases

In Chapter One, we saw that Truckenbrodt (1995) hypothesized that WRAPXP (133) is one of the constraints governing phonological phrase formation.

(133) WRAPXP Each lexically headed XP must be contained inside a Φ .

I will propose that a similar constraint, WRAPUP, is one of the constraints governing *intonational* phrase formation in Italian. Intonational phrases are of course the next step up in the prosodic hierarchy from phonological phrases. The constraints are shown in (134).

- (134) WRAPUP A minimal undominated sentential projection (CP, GP, or TP) is contained in a single intonational phrase.
- I-STRESSXP A lexically headed XP contains the head of an intonational phrase.⁴⁰
- BRANCH(I) Intonational phrases are branching. (That is, they consist of more than one phonological phrase.)

The possible rankings of these constraints in Italian are given in (135). The two rankings reflect Frascarelli's observation (129b) that it is optional for a topic to be set off in its own intonational phrase if that intonational phrase would not be branching. Optionality is represented in Optimality Theory by alternate rankings.

(135) a. WRAPUP >> I-STRESSXP >> BRANCH(I)

⁴⁰ Cf. STRESSXP: A lexically headed XP contains the head of a *phonological* phrase.

- b. WRAPUP >> BRANCH(I) >> I-STRESSXP

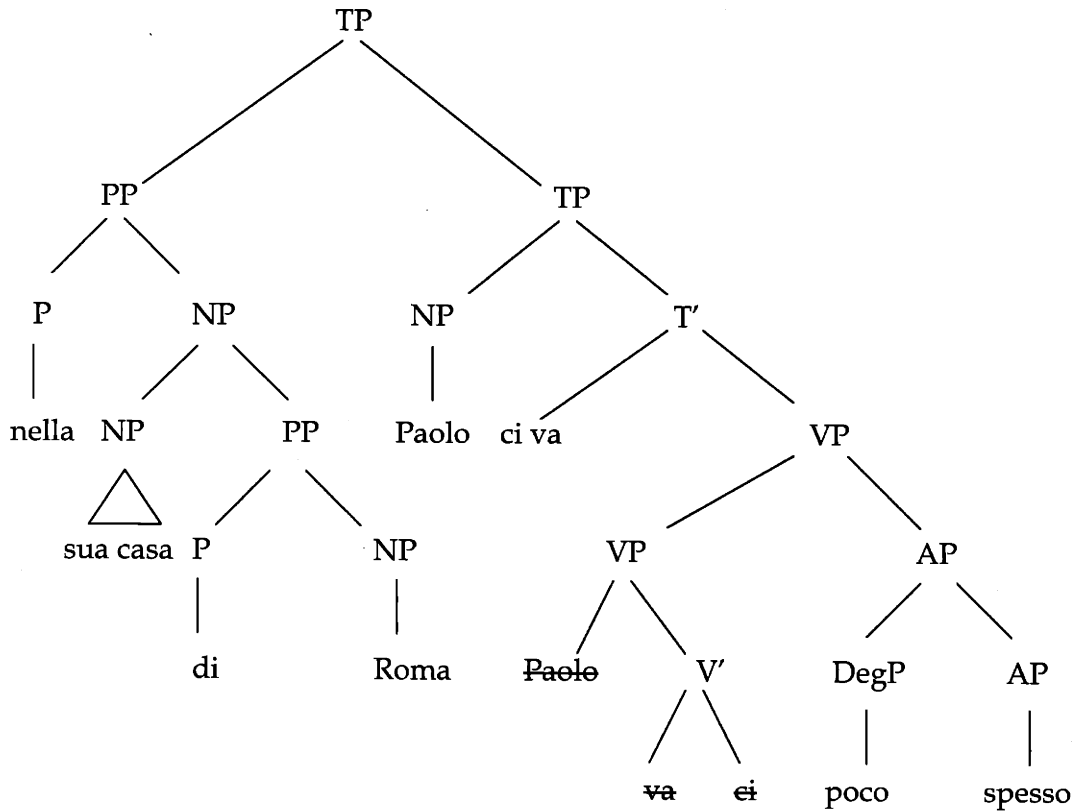
Let us examine the effect of these constraints on the sentences in (126), repeated here as (136).

- (136) a. (Nella sua casa di Roma)_I ([p]aolo ci va poco spesso)_I
in.the his house of Rome Paolo there go.3.sg. little often
'Paolo doesn't often go to his house in Rome.'
- b. (Non voglio più uscirci)_I ([k]on gli amici di mio fratello)_I
not want.1.sg. more go.out with the friends of my brother
'I don't want to go out with my brother's friends anymore.'

A tree for (136a) is given in (137). A tableau is given in (138).

(137) *Nella sua casa di Roma, Paolo ci va poco spesso.*

'Paolo doesn't often go to his house in Rome.'



Observation:

- The minimal TP in (137) is [_{TP} *Paolo ci va poco spesso*]. Therefore this phrase must be contained in a single intonational phrase to satisfy WRAPUP. The adjoined topic [_{TP} *Nella sua casa di Roma*] need not be included.
- There are five lexical heads: *casa*, *Roma*, *Paolo*, *va*, and *spesso*. However, *Roma* is inside the maximal projection of *casa* and *spesso* is inside the maximal projection of *va*. Therefore only *Roma*, *Paolo*, and *spesso* need to contain the heads of intonational phrases to satisfy I-STRESSXP.

(138) *Effect of the ranking I-STRESSXP >> BRANCH(I). Heads are assumed to be right.*

[_{TP} nella sua casa di Roma [_{TP} Paolo ci va poco spesso]] 'Paolo doesn't often go to his house in Rome.'	WRAPUP	I-STRESSXP	BRANCH(I)
a. ((nella sua casa) _φ (di Roma) _φ ([p]aolo ci va) _φ (poco spesso) _φ) _I		**!	
☞ b. ((nella sua casa) _φ (di Roma) _φ) _I (([p]aolo ci va) _φ (poco spesso) _φ) _I		*	
c. ((nella sua casa) _φ (di Roma) _φ) _I (([p]aolo ci va) _φ) _I ((poco spesso) _φ) _I	*!	*	**
d. ((nella sua casa) _φ) _I ((di Roma) _φ) _I (([p]aolo ci va) _φ (poco spesso) _φ) _I		*	*!*
e. ((nella sua casa) _φ) _I ((di Roma) _φ) _I (([p]aolo ci va) _φ) _I ((poco spesso) _φ) _I	*!	*	****

Observations:

- I have shown *gorgia toscana* applying in (138a), but not in any of the other candidates since it applies only inside an intonational phrase. The fact that *gorgia toscana* does not actually apply in (138) therefore confirms the intonational phrasing in (138b).
- Also as noted in the observations on the tree in (137), the minimal TP *Paolo ci va poco spesso* must be contained in a single intonational phrase to satisfy WRAPUP. Thus it is satisfied in (138b) and (138c), but violated in (138a, d, e).
- The topic *nella sua casa di Roma* 'to his house in Rome' is set off in a branching intonational phrase in the winning candidate. BRANCH(I) is therefore satisfied.
- As noted in the observations on (137), *Roma*, *Paolo*, and *spesso* 'seldom' must contain the heads of intonational phrases to satisfy I-STRESSXP.
- We can see by inspection that the effect of the ranking BRANCH(I) >> I-STRESSXP would be the same.

Now let us turn to the cases where the ordering of I-STRESSXP and BRANCH(I) *does* make a difference. This occurs when the topic is short enough to form a non-branching intonational phrase. Italian examples from Frascarelli (2000) are shown in (139), repeated from (128).

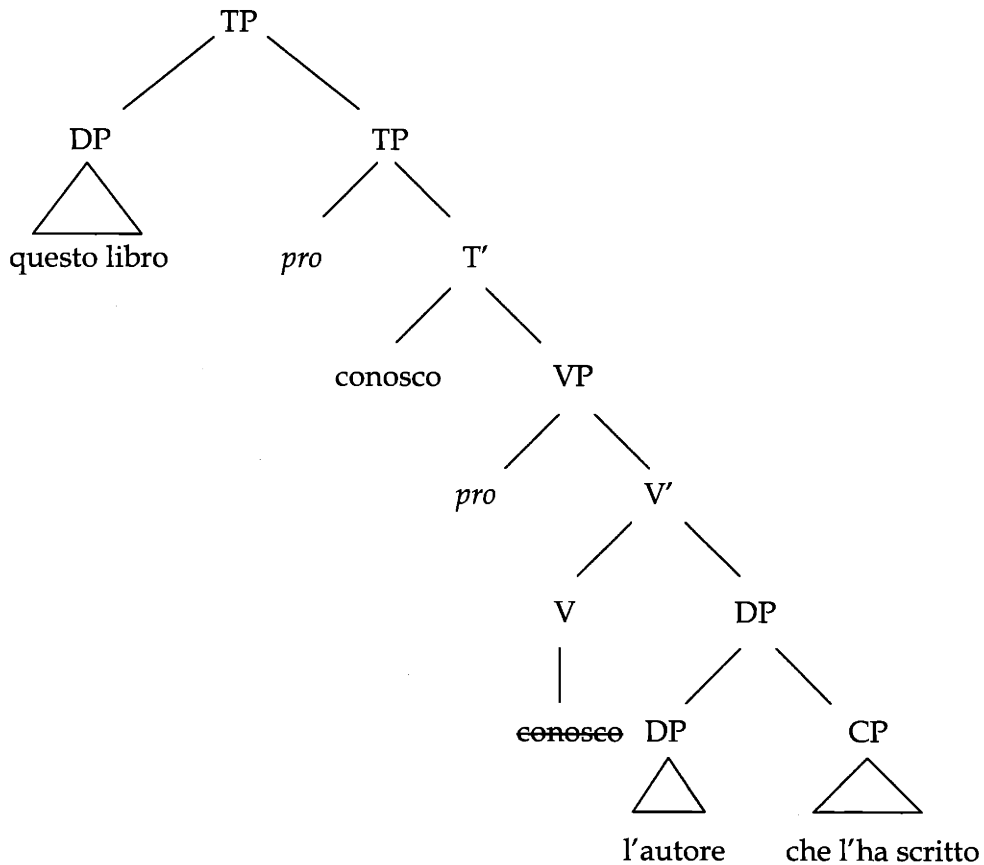
- (139) a. ((questo libro)_φ ([h]onosco l'autore)_φ (che l'ha scritto)_φ)_I
 this book know.1.sg. the author that it aux.1.sg. write.pp.
 'This book, I know the author who wrote it.'
- c. ((dopo quel giorno)_φ (non l' ho più incontrata)_φ ([h]aterina)_φ)_I
 after that day not her aux.1.sg. more meet.pp.f. Caterina
 'I haven't seen her since that day, Caterina.'

A tree for (139a) is shown in (132) Tableaux for (139a) with the two possible orderings of I-STRESSXP and BRANCH(I) are shown in (142) and (143). The respective winning candidates show that non-branching topics may or may not be set off in their own intonational phrases. Since nearly all of the examples in Frascarelli (2000) *do* have topics, branching or not, set off in their own intonational phrases, I will take I-STRESSXP >> BRANCH(I) to be the unmarked case, resulting in the ranking in (140).

- (140) WRAPUP >> I-STRESSXP >> BRANCH(I)

(141) *Questo libro, conosco l'autore che l'ha scritto.*

'This book, I know the author who wrote it.'



Observations:

- The minimal TP *conosco l'autore che l'ha scritto* 'I know the author who wrote it' must be contained in a single intonational phrase to satisfy WrapUP.
- There are four lexical heads: *libro*, *conosco*, *autore*, and *scritto*. However *autore* and *scritto* are inside the maximal projection of *conosco*, and *scritto* is inside the maximal projection of *autore*. Therefore only *libro* and *scritto* need to contain the heads of intonational phrases to satisfy I-STRESSXP.

(142) *Heads are assumed to be right.*

[_{TP} questo libro [_{TP} conosco l'autore [_{CP} che l'ha scritto]]]	WRAPUP	I-STRESSXP	BRANCH(I)
a. ((questo libro) _φ ([h]onosco l'autore) _φ (che l'ha scritto) _φ) _I		* !	
b. ((questo libro) _φ) _I (([k]onosco l'autore) _φ (che l'ha scritto) _φ) _I			*
c. ((questo libro) _φ ([h]onosco l'autore) _φ) _I ((che l'ha scritto) _φ) _I	* !	*	*
d. ((questo libro) _φ) _I (([k]onosco l'autore) _φ) _I ((che l'ha scritto) _φ) _I	* !		** *

Observations:

- In (142c, d), the topic *questo libro* 'this book' is set off in its own intonational phrase. In (142a, c), it is not.
- *Gorgia toscana* applies inside an intonational phrase. Thus I have shown it applying in (142a, c) but not in (142b, d).
- In (142a, b) the minimal TP *conosco l'autore che l'ha scritto* 'I know the author who wrote it' is contained in a single intonational phrase, as WRAPUP requires. In (142c, d) the minimal TP is divided in two intonational phrases.
- The CP *che l'ha scritto* 'who wrote it' must also be contained in a single intonational phrase to satisfy WRAPUP, but this is satisfied in all candidates.
- As noted in the observations on (132), *libro* 'book' and *scritto* 'written' must contain the heads of intonational phrases to satisfy I-STRESSXP. Since *scritto* is rightmost in the utterance, it is always the head of an intonational phrase. Thus I-STRESSXP is violated only when *libro* is not the head of an intonational phrase, as in (142a, c).
- Each intonational phrase must contain two or more phonological phrases to satisfy BRANCH(I). This is completely satisfied only in (142a). (142b, c) have one non-branching intonational phrase each; (142d) has three.

(143)

[_{TP} questo libro [_{TP} conosco l'autore [_{CP} che l'ha scritto]]]	WRAPUP	BRANCH(I)	I-STRESSXP
☞ a. ((questo libro) _φ ([h]onosco l'autore) _φ (che l'ha scritto) _φ) _I			* *
b. ((questo libro) _φ) _I ([[k]onosco l'autore) _φ (che l'ha scritto) _φ) _I		* !	
c. ((questo libro) _φ ([h]onosco l'autore) _φ) _I ((che l'ha scritto) _φ) _I	* !	*	*
d. ((questo libro) _φ) _I ([[k]onosco l'autore) _φ) _I ((che l'ha scritto) _φ) _I	* !	***	

Observations:

- The candidates are the same as in (142), thus all the observations pertaining to (142) are relevant here too.
- The order of the constraints BRANCH(I) and I-STRESSXP has been reversed from (142), with the result that the winning candidate is now (a) rather than (b).
- The winning candidate (142a) is contained in a single intonational phrase.
- We now get *gorgia toscana* applying in the winning candidate, i.e. we get [h]onosco rather than [k]onosco.

4.5 Conclusions

The phrasal phonology of Italian is governed by ranked and violable constraints. The constraints governing phonological phrase formation are shown in (144a), those governing intonational phrase formation are shown in (144b).

- (144) a. LEX(R) >> HEAD(R) >> STRESSXP >> BIN(φ)
b. WRAPUP >> I-STRESSXP >> BRANCH(I)

Two segmental phenomena useful in the analysis of Italian phrasing are *raddoppiamento sintattico*, which may be used as a diagnostic for phonological phrase boundaries, and *gorgia toscana*, which may be used as a diagnostic for intonational phrase boundaries. *Raddoppiamento sintattico* and *gorgia toscana* are governed by the constraints in (145a) and (145b), respectively.

- (145) a. ONSET, *CC, *V:# >> HEAVY >> NOCODA >> *SANDHI(w), WRAPX
b. *VCV, FAITH[voice], FAITH[son], FAITH[nas] >> FAITH[cont]

These constraints abstract away from the effects of givenness and focus. As we will see in the next chapter, it will be possible to drop in a single constraint, *GIVEN, and have all the effects of givenness and focus fall into place.

5 FÓCUS and *GÍVEN in Italian

Descriptively speaking, focus has two effects on the formation of phonological and intonational phrases in Italian, but they are surprising ones, and I will show that are both actually due to givenness rather than to focus itself. First, given constituents may be topicalized by extraposing them syntactically, and placing them in their own intonational phrases. Second, given constituents in the remainder of the sentence may merge into the phonological phrase of the focus in a process that is sometimes called “focus restructuring.” (Kenesei and Vogel 1993) The effect of this is that the merged given constituents are reduced in prominence. The actual focus itself is never made the head of a phonological phrase except as a side effect of these two processes.

Formally speaking, it is neither necessary nor, as we will see, possible to attribute the effects of focus in Italian to a FÓCUS constraint requiring a focus to be the most prominent constituent in its domain of focus. (Truckenbrodt 1995) On the contrary, as I will show, the effects of focus on Italian phrasing are entirely to the effects of the topicalization of given constituents and to *GÍVEN, which bars given constituents from being the heads of phonological phrases.

Examples of focus restructuring from Frascarelli (2000) are shown in (146). *Raddoppiamento sintattico* (RS) is once again used as a diagnostic for phonological phrase boundaries. The italics in the glosses indicate, descriptively speaking, contrastive focus.

- (146) a. i. * *
 ((Porteró)_φ ([t]ré [k:]affé)_φ)_I
 bring.fut.1.sg. three coffees
 'I will bring three coffees.'
- ii. *
 ((Porteró [t:]ré [k:]affé)_φ)_I
 'I will bring *three* coffees.'
- b. i. * *
 ((Mangeró)_φ (pásta al pomodóro)_φ)_I
 eat.fut.1.sg pasta of.the tomato
 'I will eat pasta with tomato sauce.'
- ii. * *
 ((Mangeró [p:]ásta)_φ)_I ((al pomodóro)_φ)_I
 'I will eat *pasta* with tomato sauce.'
- c. i. * * *
 ((Il caffè)_φ ([p^h]áce)_φ (ai miéi amíci)_φ)_I
 the coffee pleased to my friends
 'My friends liked the coffee.'
- ii. α. * *
 ((Il caffè [p^h]áce)_φ)_I ((ai miéi amíci)_φ)_I
 'My friends *liked* the coffee.'
- β. * * *
 ((Il caffè)_φ)_I (([p^h]áce)_φ)_I ((ai miéi amíci)_φ)_I
 'My friends *liked* the coffee.'

5.1 Previous Analyses of Focus Restructuring

5.1.1 Kenesei & Vogel (1993)

Kenesei and Vogel (1993) continue the analysis of Nespor and Vogel (1986), which we examined in §4.2.1.1. Recall that Nespor and Vogel posit a two-step process for phonological phrase formation in Italian, as shown in (147).

(147) a. *Phonological Phrase Formation*

The domain of Φ consists of a C [clitic group]⁴¹ which contains a lexical head X and all the C's on its non-recursive side up to the C that contains another [lexical]⁴² head outside the maximal projection of X.

b. *Phonological Phrase Restructuring*⁴³

A non-branching Φ , which is the first complement or modifier of a lexical head X on its recursive side, is joined into the Φ that contains X.

Kenesei and Vogel propose that the output of Phonological Phrase Restructuring be subject to a third rule, Focus Restructuring, as shown in (148).

(148) *Focus Restructuring* (Kenesei and Vogel 1993)

- a. If some prosodic constituent (i.e. Clitic Group) in sentence bears focus, place a phonological phrase boundary on its (syntactic) recursive side, and incorporate this constituent into a single

⁴¹ The bracketed text is mine.

⁴² This is what I think Nespor and Vogel mean, and which in any case is what is required if their algorithm is to work in a contemporary syntactic framework. See §4.2.1.

⁴³ As revised by Nespor (1993), quoted in Frascarelli (2000). See §4.2.2.

phonological phrase with the constituent(s) (if any) on its non-recursive side. Any items remaining in a phonological phrase after focus is re-assigned retain their phonological phrase status.

- b. If the remaining phonological phrase is non-branching, it may be joined into a single phonological phrase with the phonological phrase, if there is one, on its recursive side.

As an example of Kenesei and Vogel's approach, consider the following derivation for (146c(ii)) *Mangeró pásta per céna* 'I will eat pasta for dinner,' with contrastive focus on *mangeró*.

(149) *Contrastive focus on mangeró 'I will eat'*

- a. (Mangeró)_φ ([p]ásta)_φ (per céna)_φ *by Phonological Phrase Formation*
- b. (Mangeró [p:]ásta)_φ (per céna)_φ *by Phonological Phrase Restructuring*
- c. (Mangeró)_φ ([p]ásta)_φ (per céna)_φ *by Focus Restructuring*

Note that this derivation initially puts *mangeró* and *pásta* in separate phonological phrases (149a), then it joins them (149b), then it splits them up again (149c). This sort of round-trip derivation is known as the Duke-of-York gambit⁴⁴ (Pullum 1976, McCarthy 1999).

⁴⁴ Oh, the grand old Duke of York,
He had ten thousand men.
He marched them up the hill,
And then he marched them down again.

5.1.2 Frascarelli (2000)

Frascarelli (2000) points out the wrong predictions Kenesei and Vogel's set of rules makes when functional heads are focussed. To allow for this, she revises the Focus Restructuring Rule as shown in (151).

(151) *Focus Restructuring* (Frascarelli 2000)

- a. A [+F] constituent is contained within a Φ and restructures into the constituent on its nonrecursive side.
- b. The recursive boundary of the Φ containing the [+F] constituent maintains the location derived from the Mapping Rules [i.e. Phonological Phrase Formation (147a)].
- c. Linguistic material not included in the Focus is extraposed, forming independent *I*'s [intonational phrases].

The three Focus Restructuring rules are all represented symbolically in (152).⁴⁵

$$(152) \quad [[Y]_{\Phi} [X_{[+F]} (X_0)]_{\Phi} [Z_1 Z_2]_{\Phi}]_I \Rightarrow [[Y X_{[+F]} (X_0)]_{\Phi}]_I [[Z_1 Z_2]_{\Phi}]_I$$

Observations:

- The phonological phrase containing the focus is joined to the preceding phonological phrase.
- If the focus is a lexical head, then it is rightmost in its phonological phrase. This is the case when (X_0) is omitted in (152), and we have $[Y]_{\Phi} [X_{[+F]}]_{\Phi} \Rightarrow [Y X_{[+F]}]_{\Phi}$.
- If the focus is what Frascarelli calls a “pre-head” in the specifier of a lexical head X_0 , then X_0 rather than the focus is rightmost in the phonological phrase. This is represented in (152) as $[Y]_{\Phi} [X_{[+F]} X_0]_{\Phi} \Rightarrow [Y X_{[+F]} X_0]_{\Phi}$.
- The phonological phrase containing the focus is placed in its own *intonational* phrase. Though this does not affect the placement of phonological phrase boundaries directly, it is crucial to Frascarelli’s argument, as we will see, since it blocks Phonological Phrase Restructuring (147b).

This re-formulation fixes the problems we saw in (150), as shown in (153), where the outputs of the derivations are correct.

⁴⁵ I have substituted spaces for Frascarelli’s commas to indicate concatenation, and corrected a minor typo.

- (153) a. * *
 (Porteró)_φ ([t]ré [k:]affé)_φ *by Phonological Phrase Formation*
 *
 (Porteró [t:]ré [k:]affé)_φ *by Focus Restructuring (151)*
 ‘I will bring *three* coffees.’
- b. * * *
 (Non só)_φ (quello che faró)_φ ([d]ópo la lezióne)_φ *by PPF*
 * *
 (Non só)_φ (quello che faró [d:]ópo la lezióne)_φ *by FR (151)*
 ‘I don’t know what I’ll do *after* the lesson.’

Unlike Kenesei and Vogel, Frascarelli has Focus Restructuring applying *before* Phonological Phrase Restructuring. This would not work in Kenesei and Vogel’s approach, as shown in (154).

(154) *Contrastive focus on mangeró ‘I will eat’*

- a. (Mangeró)_φ ([p]ásta)_φ (per céna)_φ *by Phonological Phrase Formation*
 b. (Mangeró)_φ ([p]ásta)_φ (per céna)_φ *unchanged by Focus Restructuring*
 c. (Mangeró [p:]ásta)_φ (per céna)_φ *by Phonological Phrase Restructuring*

Actual phrasing with contrastive focus on mangeró.

(Mangeró)_φ ([p]ásta)_φ (per céna)_φ

This problem does not arise for Frascarelli, since she places the phonological phrase containing the focus in its own intonational phrase (151c). She assumes, secondly, that the domain of Phonological Phrase Restructuring is the intonational phrase, that is, Phonological Phrase Restructuring only takes place

inside a single intonational phrase. The unwanted application of Phonological Phrase Restructuring is therefore blocked, as shown in (155).

- (155) *Contrastive focus on mangeró 'I will eat' (Frascarelli's approach)*
- a. ((Mangeró)_φ ([p]ásta)_φ (per céna)_φ)_I *by Phon. Phrase Formation*
 - b. ((Mangeró)_φ)_I (([p]ásta)_φ (per céna)_φ)_I *by Focus Restructuring*
 - c. ((Mangeró)_φ)_I (([p]ásta)_φ (per céna)_φ)_I *unchanged by Phonological
Phrase Restructuring*

In summary, Frascarelli (2000) corrects both the theoretical and empirical problems with Kenesei and Vogel (1993). The three-step derivational approach is retained, with the order now being:

- Phonological Phrase Formation
- Focus Restructuring
- Phonological Phrase Restructuring

5.2 Focus Restructuring and Givenness: An OT Account

In this section, I will show that “focus restructuring” is an effect of the constraint *GÍVEN, and that it cannot be due to FÓCUS. The prosody of givenness and focus are strongly affected by whether or not given constituents are topicalized. I will therefore discuss both cases.

Recall from §2.2.2 that the constraints in (156a) with the ranking in (156b) govern phonological phrase formation in Italian.

(156) *Constraints Governing Phonological Phrase Formation in Italian*

- a. BIN(φ) Phonological phrases are binary.
 LEX(R) The rightmost prosodic word in a phonological
 phrase is lexical.
 HEAD(R) Phonological heads are to the right.
 STRESSXP The maximal projection of a lexical head contains the
 head of a phonological phrase. (Truckenbrodt 1995)
- b. LEX(R) >> HEAD(R) >> STRESSXP >> BIN(φ)

To these constraints, we need to add the constraint *GÍVEN, as defined in (157a), with the overall ranking hypothesized in (157b).

- (157) a. *GÍVEN A given constituent is not metrically prominent.
 b. LEX(R) >> *GÍVEN >> HEAD(R) >> STRESSXP >> BIN(φ)

I will contrast the effects of *GÍVEN with the effects of a FÓCUS constraint (Truckenbrodt 1995), as defined in (158a), with the ranking hypothesized in (158b).

- (158) a. FÓCUS A focus is the most prominent constituent in its
 domain of focus.
 b. LEX(R) >> FÓCUS >> HEAD(R) >> STRESSXP >> BIN(φ)

5.2.1 Focus and Givenness in a Single Intonational Phrase

Let us first examine a case where we have a single intonational phrase. An example is shown in (159), repeated here from (146a).

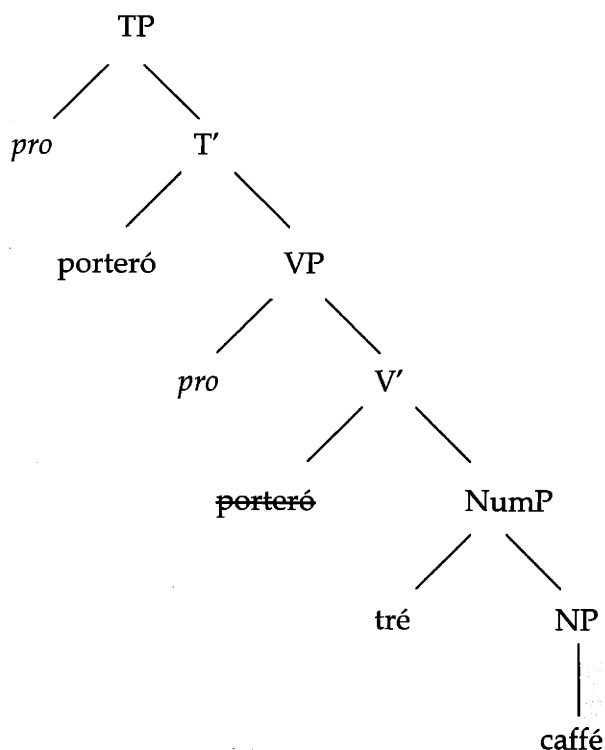
- (159) a. * *
 ((Porteró)_φ ([t]ré [k:]affé)_φ)_I
 bring.fut.1.sg. three coffees
 'I will bring three coffees.'
- b. *
 ((Porteró [t:]ré [k:]affé)_φ)_I
 'I will bring *three* coffees.'

Observations:

- In (159a), we get RS in [k:]affé, but not in [t]ré.
- In (159b), we get RS in both [t:]ré and [k:]affé.

A tree for (159a), the unfocussed version of (159), is shown in (160):

(160) *Porteró tré caffè.* 'I will bring three coffees.'

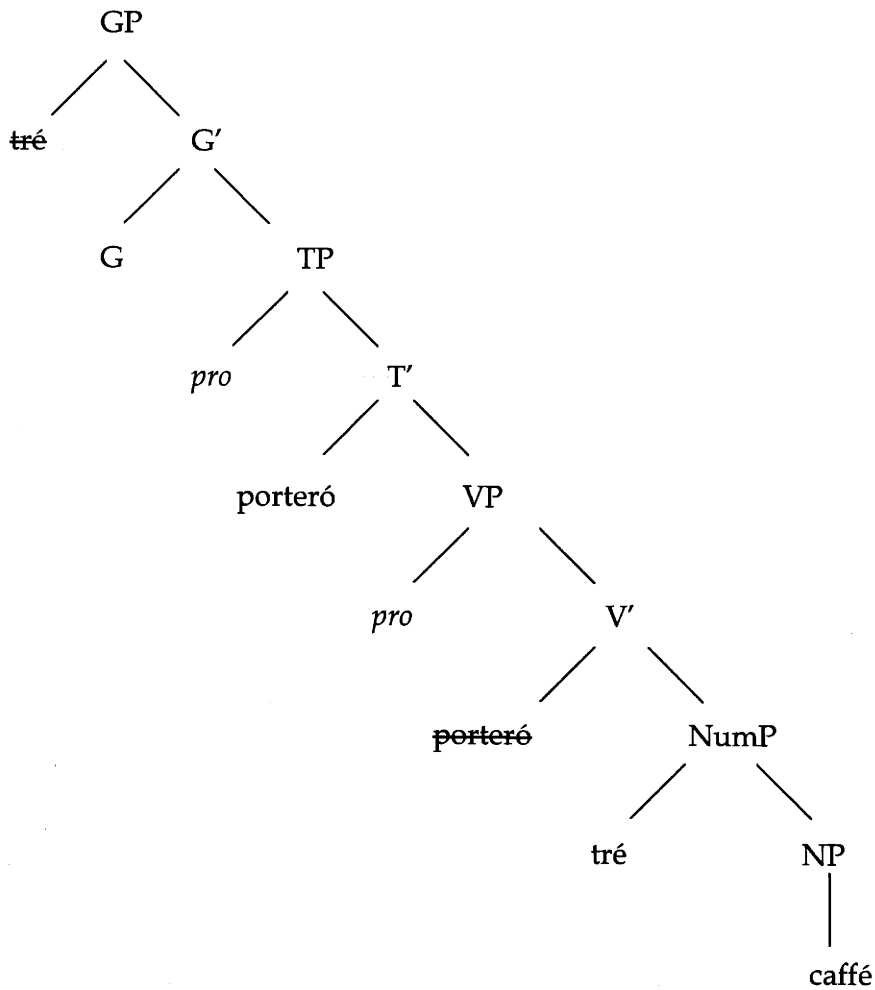


Observations:

- I have analyzed *tré* 'three' as a functional head selecting NP. Note that numerals differ in their morphology and syntax from both determiners and adjectives.
- LEX(R) requires that the rightmost prosodic word in a phonological phrase contain a lexical head. LEX(R) will therefore be violated whenever *tré* is rightmost in a phonological phrase.
- All three words end in stressed vowels. Therefore *raddoppiamento sintattico* will take place whenever two of the words are in the same phonological phrase.

A tree for (159b), the focussed version of (159), is shown in (161).

(161) *Porteró tré caffè.* 'I will bring *three* coffees.'



Observations:

- Following the notation adopted in Chapter Two, I have shown a covert copy of the focussed word, *tré* 'three' in the specifier of G.
- Words in the complement of G but not in its specifier are given. *Porteró* 'I will bring' and *caffé* 'coffee' are therefore given in (161).

A tableau for the unfocused version of the sentence is shown in (162).

(162) *Heads are shown by underlining.*

[_{TP} Porteró <u>tré</u> caffè] 'I will bring three coffees.'	LEX(R)	FÓCUS/ *GÍVEN	HEAD(R)	BIN(φ)
(<u>porteró</u>) _φ ([t]ré) _φ ([k]affé) _φ	*!			***
☞ (<u>porteró</u>) _φ ([t]ré [k:]affé) _φ				*
(<u>porteró</u>) _φ ([t]ré [k:]affé) _φ			*!	*
(porteró <u>[t:]ré</u>) _φ ([k]affé) _φ	*!			*
(porteró [t:]ré) <u>[k:]affé</u>) _φ	*!		*	*
(porteró [t:]ré [k:]affé) _φ				**!*
(porteró [t:]ré [k:]affé) _φ			*!	***
(<u>porteró</u> [t:]ré [k:]affé) _φ			*!*	***

Observations:

- LEX(R) is violated when the functional head *tré* 'three' appears rightmost in a phonological phrase.
- No constituents are either given or focussed. Therefore neither FÓCUS nor *GÍVEN can be violated.
- HEAD(R) is violated when the head of a phonological phrase, indicated here by underlining, is not rightmost in the phrase.
- The number of words in the sentence is odd, so BIN(φ) cannot be completely satisfied. The winning candidate has only one violation.
- *Raddoppiamento sintattico* is shown wherever it would apply.
- The fact that we actually get RS in [k:]affé but not in [t]ré confirms the identity of the winner.

Tableaux for the focussed version of (159) are shown in (163) and (164). In (163), the effects of a FOCUS constraint are shown; in (164), the effects of *GIVEN. As we will see, only *GIVEN gives the right result.

(163) *Heads are shown by underlining.*

[_{FP} tré G [porteró tré caffè]] 'I will bring three coffees.'	LEX(R)	FOCUS	HEAD(R)	BIN(φ)
a. (porteró) _φ ([t]ré) _φ ([k]affé) _φ	*!			***
b. (porteró) _φ ([t]ré [k:]affé) _φ		*!		*
●* c. (porteró) _φ ([t]ré [k:]affé) _φ			*	*
d. (porteró [t:]ré) _φ ([k]affé) _φ	*!			*
e. (porteró [t:]ré) _φ ([k:]affé) _φ	*!	*	*	*
f. (porteró [t:]ré [k:]affé) _φ		*!		***
h. (porteró [t:]ré [k:]affé) _φ			*	**!*
i. (porteró [t:]ré [k:]affé) _φ		*!	**	***

Observations:

- As in the previous tableau, LEX(R) bars candidates (163a, d, e) in which the functional head *tré* 'three' is rightmost in a phonological phrase.
- FOCUS requires that the focus *tré* 'three' be most prominent word in the sentence. I have shown it as satisfied whenever the focus is as prominent as it can be in this representation (163a, c, d, h).
- The winning candidate (163c) has only one violation of BIN(φ), in contrast to (163h), which has three violations.
- The winning candidate in this tableau (163c) is actually not correct. The correct form is (163h). The identity of the correct form is confirmed by the *raddoppiamento sintattico* (RS) facts. The initial consonants of *tré* and *caffé* actually both geminate. Compare the gemination marked in (163c) with that of (163h).

The tableau in (164) shows the effects of *GIVEN, which may be contrasted with the effects of FOCUS shown in the previous tableau.

(164) *Heads are shown by underlining.*

[_{FP} tré G [porteró <u>tré</u> caffè]] 'I will bring <i>three</i> coffees.'	LEX(R)	*GIVEN	HEAD(R)	BIN(φ)
a. (porteró) _φ ([t]ré) _φ ([k]affé) _φ	*!	**		***
b. (porteró) _φ ([t]ré [k:]affé) _φ		*!*		*
c. (porteró) _φ ([t]ré [k:]affé) _φ		*!	*	*
d. (porteró [t:]ré) _φ ([k]affé) _φ	*!	*		*
e. (porteró [t:]ré) _φ ([k]affé) _φ	*!	**	*	*
f. (porteró [t:]ré [k:]affé) _φ		*!		***
☞ h. (porteró [t:]ré [k:]affé) _φ			*	***
i. (porteró [t:]ré [k:]affé) _φ		*!	**	***

Observations:

- As in the previous tableau, LEX(R) bars candidates (163a, d, e) in which the functional head *tré* 'three' is rightmost in a phonological phrase.
- *GIVEN requires that the given prosodic words *porteró* and *caffé* not be metrically prominent. *GIVEN is satisfied only in (164h), which is therefore the winning candidate.
- The identity of the winner (164h) is confirmed by the *raddoppiamento sintattico* (RS) facts. The initial consonants of *tré* and *caffé* both geminate.

5.2.2 Focus and Givenness in the Presence of Topicalization

The prosody of focus and givenness in Italian are complicated by the pervasive phenomenon of topicalization. Nevertheless, we will see that, once topicalization is allowed for, a FOCUS constraint gives the wrong results, and *GIVEN gives the right ones.

An example of “focus restructuring” in the presence of topicalization is shown in (165), repeated here from (146c).

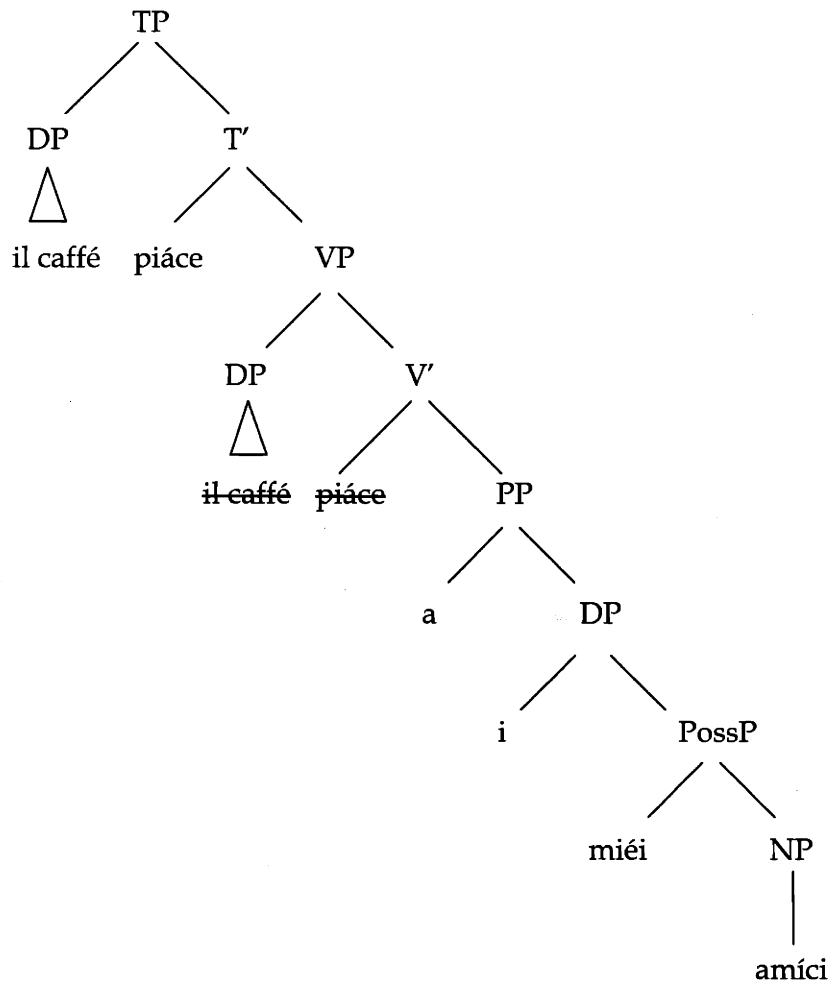
- (165) a. * * *
- ((Il caffè)_φ ([pʰ]áce)_φ (ai miéi amíci)_φ)_I
 the coffee pleased to my friends
 ‘My friends liked the coffee.’
- b. i. * *
- ((Il caffè [pʰ:]áce)_φ)_I ((ai miéi amíci)_φ)_I
 ‘My friends *liked* the coffee.’
- ii. * * *
- ((Il caffè)_φ)_I (([pʰ]áce)_φ)_I ((ai miéi amíci)_φ)_I
 ‘My friends *liked* the coffee.’

In (165b(i)), the object *ai miéi amíci* ‘to my friends’ is topicalized and set off in its own intonational phrase. In (165b(ii)), **both** the subject *il caffè* ‘the coffee’ and the object are topicalized. I will give trees and tableaux for all three examples. As we will see, whenever FÓCUS and *GÍVEN determine the outcome of the tableau, FÓCUS gives the wrong result and *GÍVEN gives the right one.

(166) Tree for (165a): No focus.

Il caffè piace ai miei amici.

'My friends liked the coffee.'



Observations:

- The tree contains three lexical heads: *caffé* 'coffee', *piáce* 'pleased', and *amíci* 'friends'. *Caffé* is outside the maximal projections of the other two lexical heads, so it must contain the head of a phonological phrase to satisfy STRESSXP. On the other hand, *amíci* is inside the maximal

projection of *piáce*. Therefore *amíci* must contain the head of a phonological phrase to satisfy STRESSXP, but *piáce* need not.

- I have analyzed *miéi* 'my' as a functional head Poss(essive) selecting NP. Possessives differ in their syntax from lexical adjectives, and they are of course not determiners, since the overt determiner *i* 'the' is already present here.
- A 'to' and *i* 'the' are clitics, and are joined both orthographically and phonologically.

A tableau for the phrasing of the tree in (166) is shown in (167). The utterance is assumed to be contained in a single intonational phrase.

(167) *Heads are shown by underlining.*

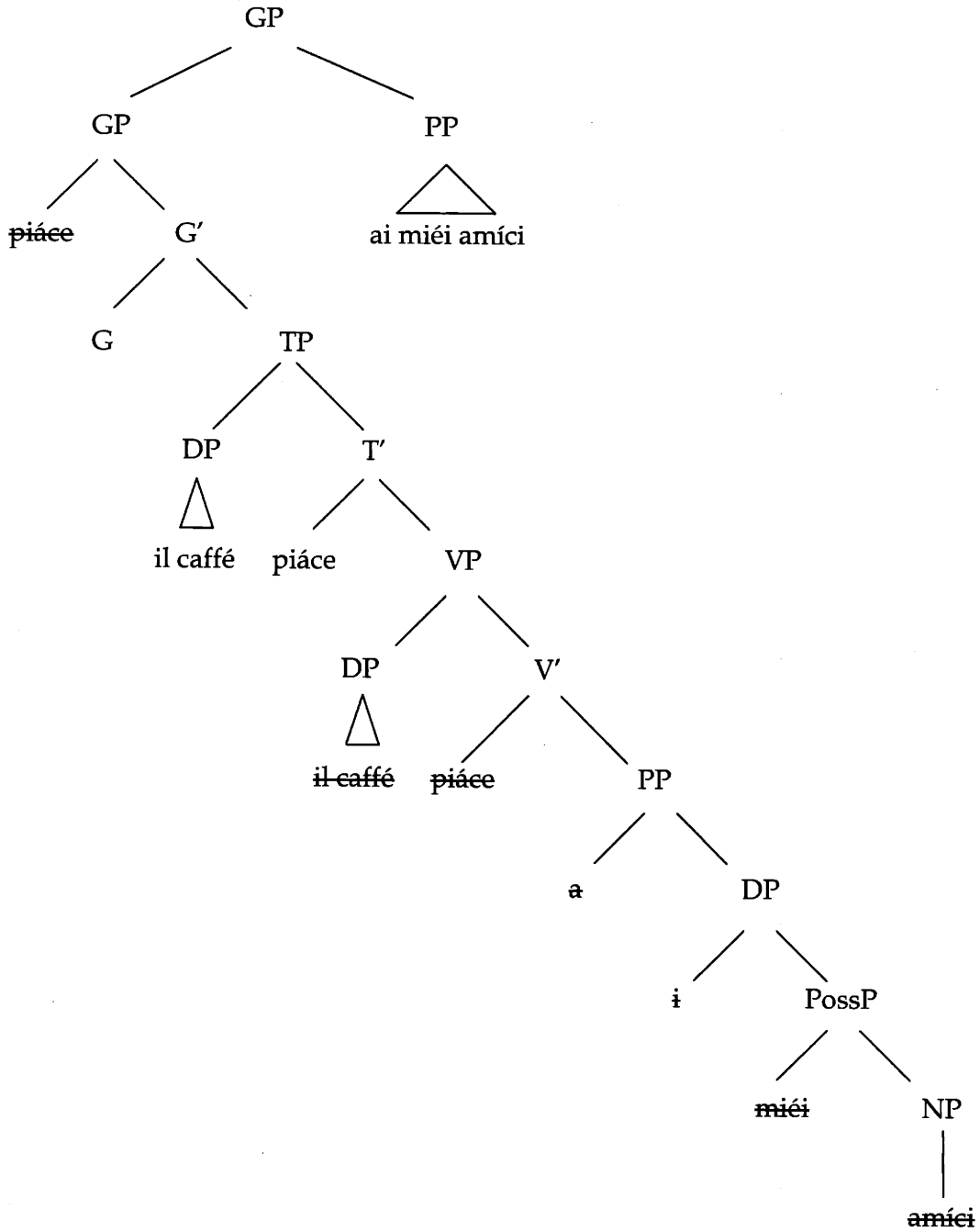
[_{TP} <u>Il caffè</u> piáce ai miéi amíci] the coffee pleased to my friends 'My friends liked the coffee.'	LEX(R)	FOCUS/ *GIVEN	HEAD(R)	STRESSXP
(<u>Il caffè</u>) _φ ([p ^h]áce) _φ (ai miéi) _φ (amíci) _φ	*!			
☞ (<u>Il caffè</u>) _φ ([p ^h]áce) _φ (ai miéi <u>amíci</u>) _φ				
(<u>Il caffè</u>) _φ ([p ^h]áce) _φ (ai miéi amíci) _φ			*!	*
(<u>Il caffè</u>) _φ ([p ^h]áce ai miéi) _φ (amíci) _φ	*!			
(<u>Il caffè</u>) _φ ([p ^h]áce ai miéi) _φ (amíci) _φ	*!		*	
(<u>Il caffè</u> [p ^h :]áce) _φ (ai miéi) _φ (amíci) _φ	*!			*
(<u>Il caffè</u> [p ^h :]áce) _φ (ai miéi) _φ (amíci) _φ	*!		*	
(<u>Il caffè</u> [p ^h :]áce) _φ (ai miéi <u>amíci</u>) _φ				*!
(<u>Il caffè</u> [p ^h :]áce) _φ (ai miéi <u>amíci</u>) _φ			*!	
(<u>Il caffè</u> [p ^h :]áce) _φ (ai miéi amíci) _φ			*!	**
(<u>Il caffè</u> [p ^h :]áce) _φ (ai miéi amíci) _φ			*!*	
(<u>Il caffè</u>) _φ ([p ^h]áce ai miéi <u>amíci</u>) _φ				*!
(<u>Il caffè</u>) _φ ([p ^h]áce ai miéi amíci) _φ			*!	**
(<u>Il caffè</u>) _φ ([p ^h]áce ai miéi amíci) _φ			*!*	**
(<u>Il caffè</u> [p ^h :]áce ai miéi) _φ (amíci) _φ	*!			*
(<u>Il caffè</u> [p ^h :]áce ai miéi) _φ (amíci) _φ	*!		*	*
(<u>Il caffè</u> [p ^h :]áce ai miéi) _φ (amíci) _φ	*!		**	
(<u>Il caffè</u> [p ^h :]áce ai miéi <u>amíci</u>) _φ				*!
(<u>Il caffè</u> [p ^h :]áce ai miéi amíci) _φ			*!	**
(<u>Il caffè</u> [p ^h :]áce ai miéi amíci) _φ			*!*	**
(<u>Il caffè</u> [p ^h :]áce ai miéi amíci) _φ			*!***	*

Observations:

- I have analyzed *miéi* 'my' as a functional head. If it appears rightmost in a phonological phrase it violates the most highly ranked constraint here, namely LEX(R), which requires the rightmost word in a phonological phrase to be lexical.
- The functional head G is not in the syntactic representation of the sentence; hence there is no focus; hence neither FÓCUS nor *GIVEN can be violated.
- The heads of phonological phrases are shown in the tableau by underlining. Violations of HEAD(R) are shown wherever a head is not rightmost in its phonological phrase.

(168) Tree for (165b(i)): Focus on piáce, with object topicalized.

Il caffè piáce ai miéi amíci. 'My friends liked the coffee.'



(175) *Effect of a FOCUS constraint.*

Il caffè piáce ai miéi amíci. 'My friends liked the coffee.'

Heads are assumed to be right. HEAD(R) is therefore not shown.

[[piáce G [Il caffè piáce]] _{FP} ai miéi amíci] _{FP} the coffee pleased to.the my friends 'My friends liked the coffee.'	WRAP UP	LEX (R)	I-STRESS XP	FÓCUS	STRESS XP
(Il caffè) _I ([p']áce) _I (ai miéi) _I (amíci) _I	*!	*			
(Il caffè) _I ([p']áce) _I ((ai miéi amíci)) _I	*!				
(Il caffè) _I ([p']áce) _I ((ai miéi) (amíci)) _I	*!	*			
(Il caffè) _I (([p']áce ai miéi)) _I (amíci) _I	*!	*	*	*	*
(Il caffè) _I (([p']áce) (ai miéi)) _I (amíci) _I	*!	*	*	*	*
((Il caffè [p':]áce) _I) (ai miéi) _I (amíci) _I		*!	*		*
((Il caffè) ([p']áce)) _I (ai miéi) _I (amíci) _I		*!	*		
((Il caffè [p':]áce) _I) ((ai miéi amíci)) _I			*		*!
((Il caffè [p':]áce) _I) ((ai miéi) (amíci)) _I		*!	*		*
●* ((Il caffè) ([p']áce)) _I ((ai miéi amíci)) _I			*		
((Il caffè) ([p']áce)) _I ((ai miéi) (amíci)) _I		*!	*		*
(Il caffè) _I (([p']áce ai miéi amíci)) _I	*!		*	*	*
(Il caffè) _I (([p']áce) (ai miéi amíci)) _I	*!		*	*	
(Il caffè) _I (([p']áce ai miéi) (amíci)) _I	*!	*	*	*	*
(Il caffè) _I (([p']áce) (ai miéi) (amíci)) _I	*!	*	*	*	
((Il caffè [p':]áce ai miéi)) _I (amíci) _I		*!	**	*	**
((Il caffè [p':]áce) (ai miéi)) _I (amíci) _I		*!	**	*	*
((Il caffè) ([p']áce ai miéi)) _I (amíci) _I		*!	**	*	*
((Il caffè) ([p']áce) (ai miéi)) _I (amíci) _I		*!	**	*	
((Il caffè [p':]áce ai miéi amíci)) _I			**!	*	**
((Il caffè [p':]áce ai miéi) (amíci)) _I		*!	**	*	**
((Il caffè [p':]áce) (ai miéi) (amíci)) _I		*!	**	*	*
((Il caffè) ([p']áce ai miéi) (amíci)) _I		*!	**	*	*
((Il caffè) ([p']áce) (ai miéi) (amíci)) _I		*!	**	*	
((Il caffè) ([p']áce) (ai miéi amíci)) _I			**!	*	
((Il caffè [p':]áce) (ai miéi amíci)) _I			**!	*	*
((Il caffè) ([p']áce ai miéi amíci)) _I			**!	*	*

Observations:

- *Raddoppiamento sintattico* is shown here wherever it applies.
- The winning candidate, ((Il caffè) ([p']áce))_I ((ai miéi amíci))_I, is in fact not correct. This is confirmed by the fact that RS does actually apply here.

(176) *Effect of *GIVEN.*

Il caffè piace ai miei amici. 'My friends liked the coffee.'

Heads are assumed to be right. HEAD(R) is therefore not shown.

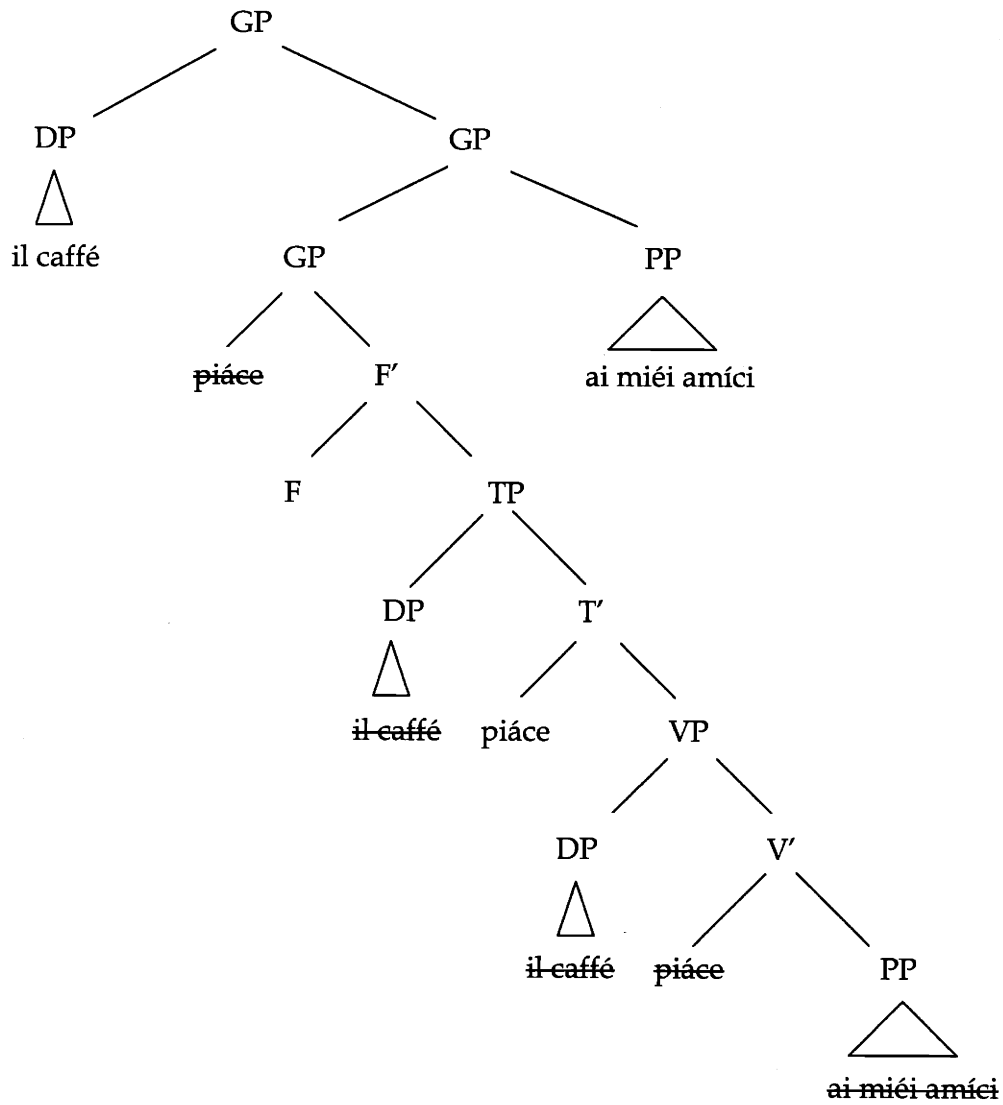
[[p]iace G [Il caffè piace]] _{FP} ai miei amici] _{FP} the coffee pleased to.the my friends 'My friends liked the coffee.'	WRAPUP	LEX(R)	I-STRESS XP	*GIVEN	STRESSXP
(Il caffè) _I ([p]iace) _I (ai miei) _I (amici) _I	*!	*		**	
(Il caffè) _I ([p]iace) _I ((ai miei amici)) _I	*!			**	
(Il caffè) _I ([p]iace) _I ((ai miei) (amici)) _I	*!	*		**	
(Il caffè) _I (([p]iace ai miei)) _I (amici) _I	*!	*	*	**	*
(Il caffè) _I (([p]iace) (ai miei)) _I (amici) _I	*!	*	*	**	
((Il caffè [p]:]iace)) _I (ai miei) _I (amici) _I		*!	*	*	*
((Il caffè) ([p]iace)) _I (ai miei) _I (amici) _I		*!	*	**	
☞ ((Il caffè [p]:]iace)) _I ((ai miei amici)) _I			*	*	*
((Il caffè [p]:]iace)) _I ((ai miei) (amici)) _I		*!	*	*	*
((Il caffè) ([p]iace)) _I ((ai miei amici)) _I			*	**!	
((Il caffè) ([p]iace)) _I ((ai miei) (amici)) _I		*!	*	**	*
(Il caffè) _I (([p]iace ai miei amici)) _I	*!		*	**	*
(Il caffè) _I (([p]iace) (ai miei amici)) _I	*!		*	**	
(Il caffè) _I (([p]iace ai miei) (amici)) _I	*!	*	*	**	*
(Il caffè) _I (([p]iace) (ai miei) (amici)) _I	*!	*	*	**	
((Il caffè [p]:]iace ai miei)) _I (amici) _I		*!	**	*	**
((Il caffè [p]:]iace) (ai miei)) _I (amici) _I		*!	**	*	*
((Il caffè) ([p]iace ai miei)) _I (amici) _I		*!	**	**	*
((Il caffè) ([p]iace) (ai miei)) _I (amici) _I		*!	**	**	
((Il caffè [p]:]iace ai miei amici)) _I			**!	*	**!
((Il caffè [p]:]iace ai miei) (amici)) _I		*!	**	*	**
((Il caffè [p]:]iace) (ai miei) (amici)) _I		*!	**	*	*
((Il caffè) ([p]iace ai miei) (amici)) _I		*!	**	**	*
((Il caffè) ([p]iace) (ai miei) (amici)) _I		*!	**	**	
((Il caffè) ([p]iace) (ai miei amici)) _I			**!	**	
((Il caffè [p]:]iace) (ai miei amici)) _I			**!	*	*
((Il caffè) ([p]iace ai miei amici)) _I			**!	**	*

Observations:

- *Raddoppiamento sintattico* is again shown wherever it applies.
- The identity of the winning candidate, ((Il caffè [p]:]iace))_I ((ai miei amici))_I, is confirmed by the fact that RS actually does apply here.

(177) Tree for (165b(ii)): Focus on *piáce*, with subject and object both topicalized.

Il caffè piáce ai miéi amíci. 'My friends liked the coffee.'



Observations:

- A covert copy of *piáce* 'pleased' is in the specifier of G, thus it is focussed.
- *Il caffè* 'the coffee' and *ai miéi amíci* 'to my friends' are in the complement of G but not in its specifier, thus both phrases are given.
- The given arguments *il caffè* and *ai miéi amíci* are both topicalized. There are three nested focus phrases: [*il caffè* [[*piáce*]_{FP} *ai miéi amíci*]_{FP}]_{FP}. The innermost GP (i.e. *piáce*) must be contained in a single intonational phrase to satisfy WRAPUP. This of course is trivially satisfied.
- There are three lexical heads: *caffé*, *piáce*, and *amíci*. None of the overt copies of these is inside the maximal projection of any of the others. All three must contain the heads of *phonological* phrases to satisfy STRESSXP. All three must also contain the heads of *intonational* phrases to satisfy I-STRESSXP. The former constraint is of course satisfied whenever the latter is.

(178) Focus on piáce, with subject and object both topicalized.

Il caffè piáce ai miéi amíci. 'My friends liked the coffee.'

Heads are assumed to be right. HEAD(R) is therefore not shown.

[il caffè [piáce G [piáce]] _{FP} ai miéi amíci] _{FP}] _{FP} the coffee pleased to.the my friends 'My friends liked the coffee.'	WRAPUP	LEX(R)	I-STRESSXP
(Il caffè) _I ([p']áce) _I (ai miéi) _I (amíci) _I		*!	
☞ (Il caffè) _I ([p']áce) _I ((ai miéi amíci)) _I			
(Il caffè) _I ([p']áce) _I ((ai miéi) (amíci)) _I		*!	
(Il caffè) _I (([p']áce ai miéi)) _I (amíci) _I		*!	*
(Il caffè) _I (([p']áce) (ai miéi)) _I (amíci) _I		*!	*
((Il caffè [p':]áce) _I (ai miéi) _I (amíci) _I		*!	*
((Il caffè ([p']áce)) _I (ai miéi) _I (amíci)) _I		*!	*
((Il caffè [p':]áce)) _I ((ai miéi amíci)) _I			*
((Il caffè [p':]áce)) _I ((ai miéi) (amíci)) _I		*!	*
((Il caffè) ([p']áce)) _I ((ai miéi amíci)) _I			*
((Il caffè) ([p']áce)) _I ((ai miéi) (amíci)) _I		*!	*
(Il caffè) _I (([p']áce ai miéi amíci)) _I			*
(Il caffè) _I (([p']áce) (ai miéi amíci)) _I			*
(Il caffè) _I (([p']áce ai miéi) (amíci)) _I		*!	*
(Il caffè) _I (([p']áce) (ai miéi) (amíci)) _I		*!	*
((Il caffè [p':]áce ai miéi)) _I (amíci) _I		*!	**
((Il caffè [p':]áce) (ai miéi)) _I (amíci) _I		*!	**
((Il caffè) ([p']áce ai miéi)) _I (amíci) _I		*!	**
((Il caffè) ([p']áce) (ai miéi)) _I (amíci) _I		*!	**
((Il caffè [p':]áce ai miéi amíci)) _I			**!
((Il caffè [p':]áce ai miéi) (amíci)) _I		*!	**
((Il caffè [p':]áce) (ai miéi) (amíci)) _I		*!	**
((Il caffè) ([p']áce ai miéi) (amíci)) _I		*!	**
((Il caffè) ([p']áce) (ai miéi) (amíci)) _I		*!	**
((Il caffè) ([p']áce) (ai miéi amíci)) _I			**!
((Il caffè [p':]áce) (ai miéi amíci)) _I			**!
((Il caffè) ([p']áce ai miéi amíci)) _I			**!

Observation:

- The phrasing is determined entirely by high-ranking constraints. Neither FOCUS nor *GIVEN is relevant here.

5.3 Conclusion

The prosodic effects of givenness and focus in Italian cannot be ascribed to a FOCUS constraint requiring focussed constituents to be the most prominent in their domains of focus, since this does not account for what Kenesei and Vogel (1993) call focus restructuring. *GIVEN accounts for this effect without additional constraints. Focus and givenness are complicated in Italian by topicalization, in which given constituents may be topicalized and placed in their own intonational phrases. These constituents cannot be de-stressed because an intonational phrase must have a head. However, if we look at the remainder of the sentence, we see that it is *GIVEN, not FOCUS, that gives the right prosody.

6 Conclusion

Givenness is represented in every component of the grammar. Rooth (1992) and Schwarzschild (1999) have shown that givenness is crucial to the interpretation of focus. Givenness can be given a precise semantic definition. On the other hand, focus is semantically vacuous: its function is to create a variable in a given constituent.

Givenness and focus are represented in the syntax by a functional head *G* which takes a given constituent in its complement and an optional focussed constituent in its specifier. This is demonstrably the correct representation in Hungarian and many other languages, and I propose that this is the representation of givenness and focus in Universal Grammar. A phrase may raise out of the complement of *G* to its specifier, either overtly as in Hungarian, or covertly at LF. This exempts the raised phrase from the interpretation of givenness and creates a variable in the given constituent. This representation eliminates F-marking (Jackendoff 1972) and focus projection (Selkirk 1984). Since *G* is freely selected from the lexicon, there is no required partition of a sentence into a presupposition and a focus (Jackendoff 1972) nor a constraint that constituents that are not focussed must be given (Schwarzschild 1999). Likewise, it is impossible that either givenness or focus has any direct connection with sentence accent (Selkirk 1984, Schwarzschild 1999), since metrical and tonal structure are present in all sentences, while the functional head *G* may or may not be lexically selected.

I have focussed in this dissertation on the phonological effects of givenness, which I have examined in Chichewa, Japanese, Hungarian, and Italian. My discussion of Italian examined the prosodic effects of givenness and

focus in the context of a comprehensive account of the phrasal phonology of Italian, drawing the work of Nespor and Vogel (1985) and especially Frascarelli (2000). Like these writers, I have made extensive use of the Italian word-sandhi phenomena of *raddoppiamento sintattico* and *gorgia toscana*, which allow us to verify our intuitions of prominence with hard segmental data.

Examination of the data from Hungarian and Italian shows that the prosodic effects of givenness and focus cannot be ascribed to a FOCUS constraint (Truckenbrodt 1995) requiring focussed constituents to be the most prominent in their domains of focus. Intuitively, what happens in these languages is not that focussed constituents receive extra stress, but that the given constituents are de-stressed. Crucially, we observe the given constituents are de-stressed *more than they need to be* in order to be less prominent than the focus. This kind of gratuitous de-stressing is inexplicable if the only constraint is that focussed constituents be the most prominent in their domains of focus. I have therefore proposed a new constraint, *GIVEN, which bars given constituents from being metrically prominent. *GIVEN accounts for the data from Hungarian and Italian, as well as the data from Chichewa and Japanese that a FOCUS constraint could account for. Surprisingly, there appears to be no need at all for a constraint requiring focussed constraints to be metrically prominent. What matters instead is that given constituents *not* be prominent. This provides strong phonological evidence for the role of givenness in the grammar.

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