RESEARCH

The syntax of information structure and the PF interface

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Focus movement to a left-peripheral position has been posited for both Hungarian and Italian. In this paper I argue against a unified cartographic treatment of focus movement, which analyses both as instances of movement to [Spec, Focus^0]. I raise some theoretical issues for cartography, such as the proliferation of focus heads and the difficulties with accounting for optionality. Empirically, I show that a set of properties distinguish Hungarian and Italian left-peripheral focus movement suggesting a different syntactic analysis for the two constructions. Following Hamlaoui & Szendrői's (2015) proposal for the syntax-prosody mapping of clauses, I show that Hungarian focus movement is prosodically motivated in that it is movement targeting the position that main stress is assigned to in the prosody. I show how the same proposal extends to right-peripheral and string-medial focus in Italian and heavy NP shift in English. I discuss the typological predictions of the that it follows from the proposal that left-peripheral focus movement is always accompanied by verb movement, while right-peripheral focus movement will target a position lower than the surface position of the finite verb. Finally, I propose that Italian left-peripheral focus movement is motivated by contrastivity. This accounts for the different characteristics of the two constructions: (i) that Hungarian, but not Italian, focus movement is accompanied by the movement of the finite verb; (ii) that Hungarian left-peripheral focus is prosodically unmarked, while Italian left-peripheral focus comes with marked prosody; and (iii) that Hungarian focus movement is pragmatically unmarked, in the sense that it can answer a *wh*-question, while Italian focus movement is explicitly contrastive (or perhaps even mirative or corrective).

1 Introduction

1.1 *Against the cartographic approach to focus movement*

Certain languages exhibit movement of the focal constituent to a designated position. The first such languages that were identified display focus movement to a left peripheral position. In particular, Brody (1990; 1995) showed that focus movement in Hungarian targets a left-peripheral functional specifier position, as in (1). This is accompanied by movement of the finite verb to the head of this functional projection, as shown by the fact that the particle-verb complex splits, as is familiar from V2 in Germanic languages.

(1)   [$_{TopP}$ Péter [$_{FocP}$ MARIT   mutatta [$_{VP}$ be t$_V$ t$_{DP}$ Zsófinak]]]
         Peter   Mary.ACC introduced PRT   Sophie.DAT
         'Peter introduced MARY to Sophie.'

Similarly, Rizzi (1997) proposed that Italian left-peripheral focus targets a designated functional specifier in the left periphery of the clause, but in Italian there is no accompanying verb movement to the head of this functional projection.

(2) $[_{FocP}$ $[_{DP}$ Il   TUO libro] Foc^0 $[_{TP}$ ho $[_{VP}$ comprato t_{DP}]]]
                    the your book   have.1SG bought
       (non il   suo)
       not the his
       'I bought YOUR book, not his.'

Brody (1990; 1995) and Rizzi (1997) proposed a unified analysis of the two cases. They argued that focus movement is like *wh*-movement. It has A-bar characteristics: it is quantificational; it gives rise to weak crossover violations. Accordingly, the *Focus criterion* (3) was proposed, stating that there is a designated position Foc^0, alongside the syntactic [+focus]-feature, attracting the focal element to the specifier of Foc^0. In addition, the verb itself may be attracted to the head position in certain languages, like Hungarian.

(3)   *Focus criterion*
       $[_{FP}$ XP_{focus} Foc^0 ... $[_{VP}$ V t_{XP}]]
                [+F]   [+F]

As I discuss in more detail elsewhere (Szendrői 2001; 2005; to appear), the cartographic approach is inherently ill-suited for the treatment of information structure-related phenomena, in particular focus movement (see also Fanselow 2006). Let me summarise some of the arguments here briefly. In the interest of space, I restrict myself to those arguments that are directly concerned with the tacit assumption underlying all cartographic work, namely that there is a one-to-one mapping between designated functional projections and their interpretations at LF (Cinque & Rizzi 2008). It is clear that this tacit assumption cannot be abandoned without making the cartographic approach meaningless − it is the hallmark of cartography. These arguments concern the optionality of focus movement and the proliferation of focus positions.

One consequence of the cartographic assumption is that by determining the syntactic position of a particular constituent, we can immediately "read off" its interpretation from its position: e.g. a focal constituent is interpreted as such *because* it sits in [Spec, FocP]. But this generalisation breaks down in the face of the fact that in most languages that have focus movement, the movement of the focal constituent is optional (see e.g. Rizzi 1997 for Italian; Gryllia 2009 for Modern Greek; Green & Jaggar 2003 for Hausa; Erguvanli 1984; Işsever 2003 for Turkish; Kügler et al. 2007 for Yucatec Mayan etc.) Given the cartographic assumption, our hands are tied in the face of systematic optionality. We have essentially three choices. The first possible treatment of optionality is to try to argue that in all those cases where it appears not to take place, movement is covert. The second possibility is to deny the existence of optionality and try to find a systematic interpretational difference between the moved and unmoved instances. The third possibility is to allow for a many-to-one mapping between syntax and LF, i.e. both the moved and the in situ position may give rise to the same interpretation.

The first possibility is problematic, because no convincing case has ever been put forward for covert focus movement in any language. The second is empirically untenable in the face of data from many languages where a particular focal interpretation can be expressed both by moved and in situ foci (e.g. English, German, Italian, Hausa etc.). So, even if an interpretational difference between moved and in situ foci can be demonstrated for one language, it is unlikely to be demonstrable for all languages. Optionality cannot be explained away in this area.

The third option would be a serious weakening of the cartographic assumption. If both in situ and moved foci can be interpreted as foci, then what is the reason for the movement operation? If the [+focus] feature on the focal constituent alone can give rise to

focal interpretation, then what is the purpose of the corresponding $Focus^0$-head? One could argue that its presence is merely a surface syntactic phenomenon without any corresponding effects at LF. But this would be giving up the idea, at the heart of cartography, that surface syntax determines LF meaning. In this version of weak cartography, the surface position of the focal element ends up being accidental. Since it has no LF effects, we cannot hope to find an explanation of why it occurs in certain languages, and why it occurs in a particular position in the syntactic tree.

Essentially the same argumentation applies in the case of the issue of proliferation of $Focus^0$-heads. Over the years, as more languages were investigated, focus positions started to proliferate. Alongside the Brody/Rizzi left-peripheral position, a structurally lower right-peripheral position was identified by Samek-Lodovici (2005). Cruschina (2011) proposed different types of focus positions for new information focus ($IFoc^0$) and contrastive focus respectively ($CFoc^0$). While languages with an active middle field, such as Dutch, were shown to necessitate a whole series of focus positions, if analysed in the cartographic approach (Neeleman et al. 2009). On first blush, this is perhaps not so problematic. After all, if the grammar can conceptualise a Foc^0 position as such, then there is no reason why this may not have arbitrary many instantiations. But proliferation is clearly a problem in light of the main underlying assumption of the cartographic proposal, namely that there is one-to-one correspondence between position and interpretation. There are only two possibilities: (i) one identifies a subtle, yet distinct interpretative effect for all these positions, or (ii) one has to weaken the cartographic assumption to allow for a many-to-one mapping between position and interpretation. Neeleman et al. (2009) argue extensively that for the Dutch middle field, the first option is not tenable because of the existence of multiple possible landing sites (see also Samek-Lodovici 2015 for a similar argument for Italian). But the second option is certainly a fatal blow to the cartographic endeavour, as it would make it devoid of any content. What is the point of assuming "designated functional positions" if there are more than one of these, and foci may target either of them, as well as remain in situ?

1.2 An alternative proposal

In this paper, I propose that there is one more reason why a cartographic treatment of Hungarian and Italian left-peripheral focus is on the wrong track, namely because it provides a unified account of two distinct constructions that only look similar on the surface. Let us note a few differences between the two. First, as already stated, Hungarian focus movement is accompanied by verb movement while Italian left-peripheral focus movement is not (Brody 1990; Rizzi 1997; see also Cruschina 2011 for same observation, to be discussed below). Second, Hungarian focus movement is prosodically unmarked in the sense that it has an optimal syntax-prosody mapping and the position of the main stress is determined by the nuclear stress rule (Szendrői 2001; 2003). In contrast, as we will see below, Italian left-peripheral focus, or at least some instances of it, constitute a misaligned syntax-prosody mapping and involve a marked position for main stress (Bocci 2013). Finally, Hungarian focus movement is pragmatically unmarked in the sense that it can be used as a simple (exhaustive) answer to a corresponding *wh*-question (Szendrői 2001; 2003); while Italian focus movement is only felicitous in pragmatically marked contexts, such as mirative or corrective contexts, and possibly contexts involving explicit contrast (Bianchi 2013).[1]

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[1] In addition, Hungarian focus movement may occur in embedded clauses under any kind of matrix predicate (see e.g. Szendrői to appear; Hamlaoui & Szendrői accepted; contra Cruschina 2011), while Italian left-peripheral focus movement is restricted to root environments or embedded under predicates of say and of opinion (Bianchi 2013; 2015). It is possible that this distinction is also related to the different prosodic

The specific analysis I adopt below for Hungarian focus movement, was proposed by Hamlaoui & Szendrői (2015); details will be presented in section 2. This account gives up syntactocentrism, which is the hallmark of the cartographic approach of Rizzi (1997) and subsequent work. There is no [+focus] feature that ensures a one-to-one mapping between syntactic position and interpretation on the one hand (i.e. at LF) and position and prosodic realisation on the other (i.e. at PF). Rather, this approach assumes direct communication between prosody and information structure. In section 3, I will show that the empirical coverage of the proposal encompasses string-final and string-medial foci in Italian and heavy NP shift in English. I will argue that the proposed analysis is both restrictive and explanatory. It makes a number of testable typological predictions, which will be discussed in section 3.3. To preview, it follows from the proposed analysis that Hungarian-style left-peripheral focus movement always involves verb movement, and that right-peripheral focus movement always targets a position structurally lower than the surface position of the verb. Section 4 introduces the notion of contrast-related movement (Neeleman et al. 2009; Neeleman & Vermeulen 2012). I discuss the prosodic characteristics of this type of movement, proposing that contrastive fronting involves a misaligned syntax-prosody mapping and a marked, left-aligned positioning of the main stress inside the intonational phrase. Finally, in section 5, I will show that the nature of the syntax-phonology mapping of clauses involving moved foci provides some insight into why the characteristics of Hungarian vs. Italian left-peripheral focus movement cluster the way they do, and conclude the paper.

2 Stress-focus correspondence according to Hamlaoui & Szendrői (2015)

If focal interpretation at LF and beyond does not seem to be the key driving force behind syntactic focus movement, then perhaps the motivating factor lies at the PF interface. Starting from Vallduví (1992) and Zubizarreta's (1998) work, proposals have been put forward that propose to account for focus movement in prosodic terms.

In particular, Reinhart (1995; 2006) proposed that there is a direct link between focus and its prosodic correlate. In particular, the following is assumed to hold in any language that has stress system (i.e. not lexical or grammatical tones):

(4)   Stress-focus correspondence (Reinhart 1995; 2006):
        The focus of an utterance always contains the prosodically most prominent
        element of the utterance.

This is supposed to hold for all foci, including moved and in situ focus, as well as new information and contrastive foci. Note that the universality of (4) has been questioned on empirical grounds. For instance, Downing & Pompino-Marshall (2013) show that Chichewa does not associate (neutral) focus with prosodic prominence. They argue that the stress-focus correspondence principle must be regarded as a soft constraint whose effect is not necessarily observable in every language.

Nevertheless, it is clear that (4) holds in many languages and syntactic analyses of focus movement targeting the stress position have been proposed for these. For instance, Szendrői (2001; 2003) proposed that left-peripheral focus movement in Hungarian targets

characteristics of the two constructions in the sense that in many languages, like English (Downing 1970) and Hungarian (Hamlaoui & Szendrői accepted), but not Japanese (Selkirk 2009; Ishihara 2014), embedded clauses do not normally form distinct intonational phrases. In such languages, it is more likely that a misaligned syntax-prosody mapping would be applied in root clauses than in embedded clauses, since there are no intonational phrase boundaries corresponding to the embedded clause by default. A different, semantic explanation for the embedding restrictions on Italian left-peripheral focus is offered by Bianchi (2013). I will leave this issue open here.

the position where main stress is assigned by the nuclear stress rule. Szendrői (2002) and Samek-Lodovici (2005) argued that the same holds for right-peripheral focus in Italian.[2] These analyses share the basic idea that the position targeted by focus movement in these languages is determined by the syntax-prosody mapping and the prosodic rules that assign main stress, i.e. the nuclear stress rule.

Let us familiarise ourselves with the details of Hamlaoui & Szendrői's (2015) proposal. There are two contributing elements of the proposal that we need to spell out here. First, it is widely assumed that in prosody, the syntactic "clause" corresponds to an intonational phrase, which is the domain where main stress is assigned. But there is no consensus in the literature of the syntax-phonology interface about the correct definition of "clause" (see Selkirk 2005; 2011; Zerbian 2006; Cheng & Downing 2007; Truckenbrodt 2007; 2015). Hamlaoui & Szendrői (2015) argue for a flexible approach that does not link a particular syntactic projection, say CP or IP to the prosodic intonational phrase. Rather, they argue, the position of the finite verb in overt syntax determines the syntactic phrase relevant for the syntax-prosody mapping of clauses. Second, Hamlaoui & Szendrői (2015) offer a specific formulation of the nuclear stress rule, which derives the empirically correct generalisation that by default main stress is often located at the edges of intonational phrases: the right edge in English, German or Italian; the left edge in Hungarian.

In more detail, Hamlaoui & Szendrői (2015: 80) proposed that the clause should be understood as "the highest projection in the root clause (see Downing 1970), to which the verbal material (i.e. the finite verb itself, the inflection, an auxiliary or a question particle) is overtly moved or inserted, together with the material in its specifier."[3] This is achieved by the following set of constraints, which are operative at the syntax-phonology mapping at the "clause" level.[4]

(5)   Syntax-prosody correspondences on the 'clause'-level (Hamlaoui & Szendrői 2015: 82, example 4):
    a.   Syntax-prosody mapping
        (i)   ALIGN-L (HVP-ι): Align the left edge of the highest projection whose head is overtly filled by the root V, or verbal material, with the left edge of an ι.
        (ii)   ALIGN-R (HVP-ι): Align the right edge of the highest projection whose head is overtly filled by the root V, or verbal material, with the right edge of an ι.

    b.   Prosody-syntax mapping
        (i)   ALIGN-L (ι-HVP): Align the left edge of an ι with the left edge of the highest projection whose head is overtly filled by the verb or verbal material.
        (ii)   ALIGN-R (ι-HVP): Align the right edge of an ι with the right edge of the highest projection whose head is overtly filled by the verb or verbal material.

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[2] See also Horvath (2000; 2007; 2010); Büring & Gutierrez-Bravo (2002); Fanselow (2006) and many subsequent works for similar proposals. See Szendrői (to appear) for a fuller review of the literature.

[3] To clarify, the highest position of verbal material is understood to mean the highest position filled by verbal material within Grimshaw's (1997) extended projection of the verb. So, if the language has auxiliaries, like English then these are relevant for the syntax-prosody mapping. If there is V2, then C is the relevant position.

[4] Two further constraints are employed by Hamlaoui & Szendrői (2015) to ensure that whatever falls outside the projection whose head is filled by the overt verbal material is wrapped under an intonational phrase layer and does not remain extrametrical. But these mapping principles are not needed for the data to be discussed here.

Let us consider the abstract schemata they give.

(6)   Hamlaoui & Szendrői (2015: 83, example 5)
   a. $(\iota$ XP V ... t_V ... $t_{XP})$ see (7)
   b. $(\iota$ XP ...$(\iota$ V ... $t_{XP}))$

In (6a), the verb moves together with the moved XP, and as a result both will be inside the largest projection whose head is overtly filled by the verb or verbal material. So, by (5), the left edge of the intonational phrase precedes the moved XP. In contrast in (6b), the XP moves to a position that is higher than the projection whose head is occupied by the surface position of the verb (this may be the in situ position of the verb or not). By (5), the XP is phrased outside the innermost intonational phrase in (6b). As Hamlaoui & Szendrői (2015) argue extensively such a position is ideal for topic constituents. They show that Hungarian left-peripheral topics and the zero-coded passive left-dislocation in Bàsàá exemplify this schema.

   But let us concentrate here on instances of focus movement. As already mentioned, in Hungarian focus movement, the focus movement targets a left-peripheral specifier accompanied by movement of the finite verb to the head position. So this structure, see (7), exemplifies schema (6a).

(7)   Hungarian focus movement
   $(_{\iota}$ $[_{FocP}$ Pétert$_i$ szerette$_j$ $[_{PredP}$ meg t_j $[_{VP}$ Mari $t_i]]]$ $)$
                   Peter.ACC loved   PRT   Mary
   'It was PETER that Mari fell in love with.'

Hamlaoui & Szendrői (2015) provide a prosodic analysis of Hungarian yes-no questions and declaratives identifying the main stress in these constructions on the leftmost constituent inside the intonational phrase (see also Varga 2002) and supporting the prosodic phrasing indicated in (7). A pitch track of an utterance with a left-peripheral topic followed by a left-peripheral focus is provided in Figure 1. Here, we can see that the topic, which is contained in the outer layer of a recursive set of intonational phrases does not receive main stress (cf. (6b)), while the left-peripheral focus receives main stress by virtue of occupying the leftmost position inside the innermost segment of the recursive set of intonational phrases. The pitch accent associated with main stress in declaratives is $H + L^*$. The pitch accent on the prefocal topic is variable, with LH as indicated here as a frequent option.

   Hamlaoui & Szendrői (2015) propose the following prosodic constraints to account for the position of main stress. In Hungarian, the constraint ranking is STRESS-ι > > ENDRULE-L > > ENDRULE-R.

(8)   Hamlaoui & Szendrői (2015: 87, example16)
   a.   EndRule-L
        Main stress is on the leftmost phonological phrase of the ι.
        (Violated if main stress is not on the leftmost phonological phrase within ι.)
   b.   EndRule-R
        Main stress is on the rightmost phonological phrase of the ι.
        (Violated if main stress is not on the rightmost phonological phrase within ι.)
   c.   Stress-ι
        Every ι has a stressed phonological phrase. (Violated by headless ι.)

The proposed constraints and the proposed ranking derive the fact that main stress in Hungarian falls on the leftmost constituent in the intonational phrase (because ENDRULE-L
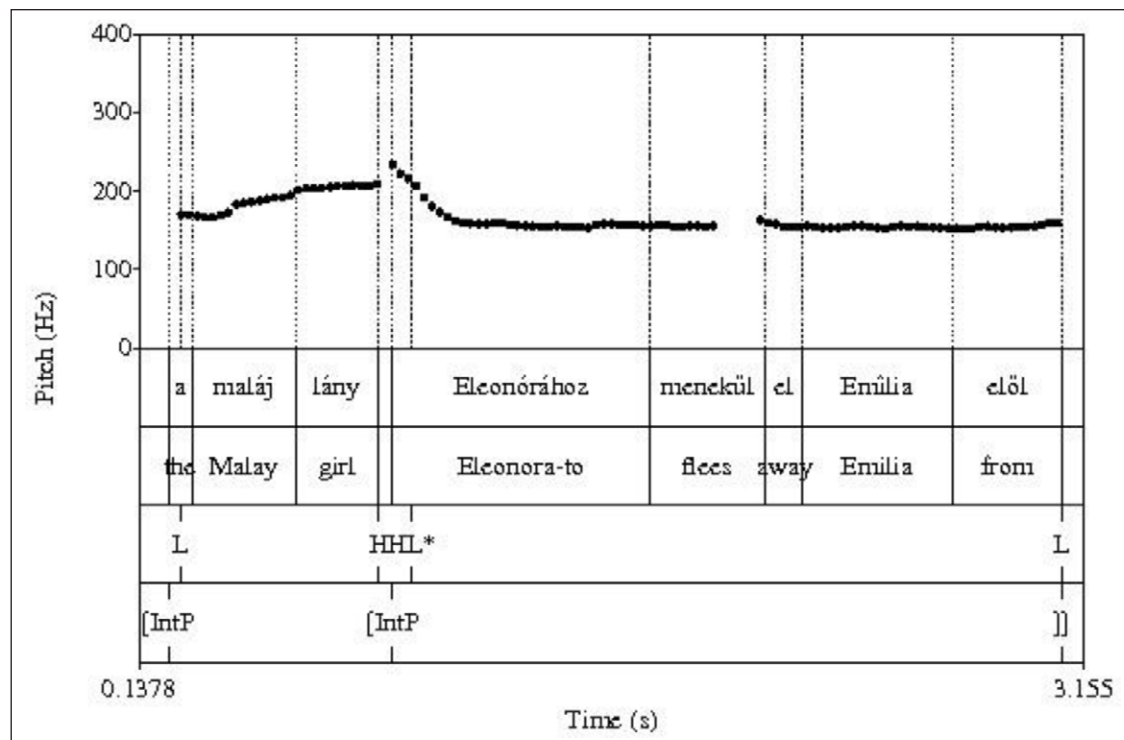
Figure 1: F⁰ contours for the Hungarian declarative with focus fronting:

A   maláj   lány Eleonórához menekül el   Emília elöl.
the Malay girl   Eleonora.to   escapes   PRT Emilia from
'The Malay girl escape from Emilia to ELEONORA.'

outranks ENDRULE-R). In recursive intonational phrases (e.g. (ι …. (ι…..))), the high-ranked STRESS-ι ensures that the main prosodic prominence is inside the innermost intonational phrase. The interested reader is referred to Hamlaoui & Szendrői (2015) for further details.

As a result, the syntactically left-peripheral focal constituent adjacent to the moved verb in Hungarian will receive main stress. In particular, the verb movement ensures that the intonational phrase includes the moved focus, by (5a), and the stress constraints in (8) under the proposed ranking have the effect that main stress falls on this position (i.e. because it is leftmost in the innermost intonational phrase). So, Hungarian focus movement is analysed as a syntactic operation that ensures that the stress-focus correspondence principle (4) is satisfied in a structure that involves syntactic movement of the focus (and the verb) but which has unmarked syntax-prosody mapping and unmarked prosody.

If the focus movement was not accompanied by verb movement, the fronted constituent would not be mapped as the leftmost constituent inside the innermost intonational phrase, so it would not receive main stress.[5] Rather, it would be phrased under the outer segment of a recursive set of intonational phrases. As Hamlaoui & Szendrői (2015) showed this is typical for aboutness topics, which are often (but not necessarily) outside the innermost intonational phrase. The same applies to right-dislocated constituents in Italian, as I will show in section 3.1 below.

This analysis provides an explanation as to why Hungarian focus movement is typically accompanied by verb movement. In contrast, the presence or absence of verb movement is accidental in the cartographic approach.

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[5] See section 3.4 for an exception to this generalisation, involving contrastively focused universal quantifiers and fronted *also*-phrases, which, I argue, undergo a marked, misaligned syntax-prosody mapping.

3. Extending the empirical coverage

3.1 Italian focus

3.1.1 String-final and string-medial focus

Szendrői (2001; 2002) and Samek-Lodovici (2005) distinguished three constructions involving focus in Italian. This distinction is only supposed to be descriptive and some of these, or possibly all three, share the same syntactic and prosodic characteristics. But for ease of reference these labels are helpful. Italian focus can be string final, as in (9a). Such focus can be narrow or broad. Focus can be string medial, as in (9b) where the finite verb precedes the focus, but other material may follow it. Finally, left-peripheral focus is always followed by the finite verb and only dislocated topics may precede it, see (9c).

(9)　　　Adapted from Samek-Lodovici (2015: 183, example 36)
　　　　Context: Avete　　　raccontato　tutto　　　a　Marco?
　　　　　　　　　have.2SG　told　　　　　everything　to　Mark
　　　　　　　　　'Did you tell everything to Mark?'

　　a.　string-final focus
　　　　Abbiamo　raccontato　tutto　　　　　[a LUCA]$_F$, (non a　Marco).
　　　　have.1PL　told　　　　everything　to Luke,　(not　to　Mark)
　　　　'We told everything to LUKE (not Mark).'

　　b.　string-medial focus
　　　　Abbiamo　raccontato　[a LUCA]$_F$, tutto,　　　(non a　Marco).
　　　　have.1PL　told　　　　to Luke,　　everything, (not　to　Mark)
　　　　'We told everything to LUKE (not Mark).'

　　c.　left-peripheral focus
　　　　[A　LUCA]$_F$, abbiamo　raccontato　tutto,　　　(non a　Marco).
　　　　to　Luke,　have.1PL　told　　　　　everything, (not　to　Mark)
　　　　'We told everything to LUKE (not Mark).'

Let us start our analysis with string-final and string-medial foci. We will turn to left-peripheral focus in section 3.1.2. Szendrői (2001; 2002) argued that Italian string-final focus is also an instance of stress-driven focus movement (see also Samek-Lodovici 2005 for essentially the same claim). In string-medial focus, we simply deal with string-final focus, with material that follows the focus being right-dislocated. In more recent work, Samek-Lodovici (2015) argues extensively that both string-final focus and string-medial focus are in situ. Both Szendrői's and Samek-Lodovici's (older and more recent) analyses maintain that the string-final and string-medial focus occupies the neutral main stress position at the right edge of the intonational phrase. I accept Samek-Lodovici's (2015) syntactic arguments that in cases where arguments appear to be reordered it is not the focal element that moves, rather other arguments can 'escape' occupying the main stress position by either right-dislocation or short prosodically motivated leftward shift. This means that string-final and string-medial foci are in fact in situ.

　Samek-Lodovici (2006; 2015) reiterated Cardinaletti's (2002) arguments to show that right-dislocated elements in Italian are clause external, in the sense of being higher than the IP node containing the finite verb and the subject, as in (10) (see also Ott & de Vries 2016 for an alternative syntactic analysis).[6] Accordingly, as (10) shows, right dislocated elements are not freely ordered with respect to right peripheral subjects in Italian, which we may assume are VP-internal (but certainly IP-internal).

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[6] Samek-Lodovici (2015) adopts a Kaynean left-ward movement plus remnant-movement analysis for right dislocation. See his Appendix B for syntactic arguments in favour of this.

(10) a. Samek-Lodovici (2005: 715, example 44)
          Context: Who spoke to Mary?
          Le   ha   parlato GIANNI a   Maria
          her.DAT has.3SG spoken   John,   to Mary
          'JOHN spoke to her, to Mary'

      b. Context: Who spoke to Mary?
          *Le   ha   parlato a   Maria GIANNI
          her.DAT   has.3SG spoken   to Mary   John
          'JOHN spoke to her, to Mary'

String-medial internal argument foci are also lower than right-dislocated phrases, as shown in (11), where it is illustrated that such foci are not freely ordered with right-dislocated constituents either.

(11) A: Chi   hai   presentato   a   Gianni?
          who   have.2SG introduced   to John
          'Who did you introduce to John?'

      B: Gli   ho   presentato MARIA a   Gianni.
          he.DAT   have.1SG introduced Mary   to John

      B': *Gli   ho   presentato a   Gianni MARIA.
          he.DAT   have.1SG introduced to John   Mary
          'I introduced MARY to John.'

Given the syntactic analysis that shows that (i) string-medial and string-final focus is in situ and (ii) right-dislocated elements follow string-medial foci and (iii) right-dislocated elements are outside IP, perhaps adjoined to it, we face the following task. As Samek-Lodovici (2005: 715) puts it, "any adequate analysis of Italian rightward focus must explain on one hand why right dislocation prevents focus from occurring rightmost in its clause and on the other why focused constituents are still forced to occur rightward even though they cannot occur rightmost." I will now show that Hamlaoui & Szendrői's (2015) proposal does precisely that.

According to Hamlaoui & Szendrői's (2015) proposal for the syntax-prosody mapping of intonational phrases, given in (5), the notion of 'clause' is defined by the position of the finite verb in overt syntax. Italian has V-to-I movement, so we may conclude that in declarative sentences the syntactic unit corresponding to the intonational phrase is IP. Any material sitting external to the core IP, say adjoined to IP, or in a functional position higher than IP, will be external to the innermost intonational phrase in a set of recursive intonational phrases. Let us illustrate this for string-medial focus. In (12), the narrow focus is in situ in the VP, with the indirect object in an IP-adjoined, right-dislocated position. Given the mapping principles in (5) we obtain the prosodic structure given in (12).

(12) (ι (ι φ φ) φ)
      [$_{IP}$ [$_{IP}$ Gli   ho   presentato [$_{VP}$ t$_V$ MARIA]] a   Gianni].
               he.DAT   have.1SG introduced   Mary   to John
      'I introduced MARY to John.'

Let us now see how main stress is assigned in such a structure. Since Italian main stress is rightward oriented (unlike Hungarian, which is leftward oriented), we may assume that the prosodic constraints in (8) are ranked as in (13).

(13) Ranking of prosodic constraints in Italian
      Stress-ι >> EndRule-R >> EndRule-L

It is easy to see that such a ranking will result in a winning candidate with main stress on the phonological phrase corresponding to the focal constituent (indicated with bold in (12)). This is because main stress falling on the right-dislocated element would violate the higher-ranked STRESS-ɩ, while main stress on any element to the left of the focus would incur a further violation on ENDRULE-R.

This result is consistent with the widely accepted prosodic fact that the intonation of postfocal material in Italian is always completely flat. It was indeed due to the lack of post-focal pitch accents that Szendrői (2001; 2002) treated post-focal material in sentences with string-medial focus as extrametrical: no pitch accents can be assigned to postfocal material, so, it was assumed, there are no phrasal stresses there. Subsequent closer phonetic evidence casted doubt on this conclusion, however. Bocci & Avesani (2015) carried out phonetic experiments that revealed that post-focal material undergoes prosodic phrasing into φs. The evidence for phrasing comes from final-syllable lengthening in right-dislocated phrases. Such lengthening, they argue, is a sign of a right-edge prosodic boundary, arguably, of a right-edge intonational phrase boundary. Following Bocci (2013), they concede, however, that postfocal phonological phrases in Italian always receive a L* accent, although they note that a wider range of post-focal pitch accents are allowed in other Romance languages, such as European Portuguese (Frota 2000).

Unlike Szendrői's (2002) proposal, Hamlaoui & Szendrői's (2015) proposal is consistent with these prosodic findings, as there is in fact a rightward intonational phrase boundary following right-dislocated elements in this analysis, see e.g (12) above. At the same time, due to the nature and ranking of the prosodic constraints regulating the position of main stress, it is ensured that the phonological phrases outside the innermost segment of the recursive intonational phrase never receive main stress, although, they can receive phrasal stress. Whether phrasal stress is actually targeted by phrasal L pitch accents in postfocal constituents, or whether these are accentless, is hard to determine empirically. But either scenario is consistent with Hamlaoui & Szendrői's (2015) proposal.

Another criticism levelled at Szendrői's (2001; 2002) analysis by Bocci & Avesani (2015: 31) and Bocci (2013: 171) was the following. Sometimes focused *wh*-phrases in Italian receive main stress at the left-periphery of the clause, nevertheless an H% boundary tone (optionally) occurs aligned with the final syllable of the clause. If postfocal material is extrametrical, then we cannot account for the presence of the final question rise on the last syllable of the postfocal string. But this criticism does not apply to Hamlaoui & Szendrői's (2015) proposal, because the outermost intonational phrase would provide a locus for the assignment of the question tune.[7]

Hamlaoui & Szendrői's (2015) analysis then can be successfully applied to account for string-final and string-medial focus in Italian without any additional assumptions. It derives the fact that (i) main stress is always on the focal constituent, and that (ii) postfocal material may not receive main stress, only phrasal accents.

The analysis has two further advantages when compared to a similar analysis proposed by Samek-Lodovici (2015). Samek-Lodovici's (2015: Chapter 6) analysis derives the same facts (i.e. (i) and (ii)), but it does so with more assumptions. First, in Hamlaoui & Szendrői's (2015) analysis (ii) falls out from the fact that right-dislocated elements are outside the core IP syntactically. It is by the interplay between the syntactic position of right-dislocated phrases and the proposed mapping and prosodic principles (5 and 13),

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[7] Note that the data showing the final question rise involves questions like *Chi di loro avrà votato il nostro emendamento?* 'Who of them has voted in favour of our amendment?', which does not involve a right-dislocated constituent. In order to see clearly which intonational phrase boundary (innermost or outermost) does the final rise actually align with we would need to consider sentences involving right dislocated elements.

that right-dislocated phrases end up without main stress. In contrast, Samek-Lodovici's analysis derives (ii) by assuming an extra constraint called DESTRESS-RD, which ensures that "R-marked [i.e. right-dislocated] constituents are not prominent in *up* [i.e. Utterance Phrase]." (Samek-Lodovici 2015: 287, example 109).

The second welcome result of Hamlaoui & Szendrői's (2015) analysis is that they do not posit a leftward intonational phrase boundary following the string-medial focus and preceding the right-dislocated element. Both Samek-Lodovici (2015) and Bocci (2013) posit a structure like (14) for string-medial focus. The boundary in question is indicated with bold in (14).

(14)   ($_{up}$ ($_{\iota}$ Gli   ho   presentato   MARIA) ($_{\iota}$ Gianni.))
           he.DAT have.1SG introduced Mary   to John
        'I introduced MARY to John.'

But there is in fact no phonetic evidence for the presence of such an additional leftward intonational phrase boundary preceding the right-dislocated element. Crucially, as we have already discussed above, Bocci & Avesani (2015) supply phonetic evidence of the two rightward intonational phrase boundaries preceding and following the right-dislocated phrase, but not for the leftward boundary posited by Bocci (2013) and Samek-Lodovici (2015). Indeed, if the right-dislocated phrase is small, it is also quite strange to assume that it forms its own intonational phrase without effectively neutralising the distinction between phonological phrases and intonational phrases. Moreover, an analysis like (14) requires the use of a further level of representation, the Utterance Phrase. Finally, there seem to be various prosodic differences between left- and right-dislocated elements in Italian (see e.g. Frascarelli 2000; also Feldhausen 2010 for similar distinctions for Catalan) that suggest that the former but not the latter may constitute full intonational phrases. For instance, left-dislocated phrases may be assigned a larger variety of pitch accent types, while, as already stated, right-dislocated elements always receive a level L tone. So, overall, Hamlaoui & Szendrői's (2015) analysis of right-dislocation involving nested intonational phrases is preferable over Samek-Lodovici's and Bocci's analysis for the structure in (14).

3.1.2 Left-peripheral focus

Let us now turn to left-peripheral focus in Italian, see (9c) above. Both Szendrői (2001; 2002) and Samek-Lodovici (2015) argued that such cases constitute foci that are in fact rightmost within their own intonational phrases, with all the post-focal material, including the finite verb and the verb phrase, sitting outside the intonational phrase that contains the focus. Szendrői (2001; 2002) proposed that the postfocal material is only prosodically external, while Samek-Lodovici (2015) presents a host of arguments in favour of the position that postfocal material in utterances with left-peripheral focus is syntactically right-dislocated.[8] To the extent that he is right, Hamlaoui & Szendrői's (2015) analysis extends to these cases, given that as we have seen above, this analysis can derive the fact that right-dislocated phrases do not receive main stress. (15) contains some examples with all post-focal constituents right-dislocated. The prosodic phrasing indicated is by Hamlaoui & Szendrői's (2015). Given the assumed right-dislocated nature of the postfocal phrases, main stress on the focal constituent is derived correctly.

(15)   a.   Samek-Lodovici (2015: 197, example 72)
              ($_{\iota}$ ($_{\iota}$ ($_{\iota}$ A   MARIA$_{F}$), la   mela,)   abbiamo dato.)
                   to Mary,   the apple.ACC, have.1PL given
              'We gave the apple to MARY.'

---

[8] Samek-Lodovici (2015) argues for a movement analysis for right-dislocated elements, which I do not endorse.

b. Samek-Lodivici (2015: 200, example 75)
(_ι (_ι (_ι A MARIA_F), abbiamo dato,) la   mela.)
        to Mary,   have.1PL given, the apple.ACC
'We gave the apple to MARY.'

However, this analysis predicts that there is always a rightward intonational phrase boundary following left-peripheral foci. But there is conflicting phonetic evidence on this issue. Consider for instance the pitch contour of *Germanico_CF la vorebbe invitare,, Pierangela* 'GERMANICO would like to invite her,, Piarangela.' in Figure 2 from Bocci & Avesani's (2011) experiment.

As reported by Bocci (2013: 158), Bocci & Avesani (2006), in a survey involving one speaker, found that left-peripheral foci did not contain a stronger boundary at their right edge than full noun phrase subjects in a broad focus utterance. In contrast, as Bocci (2013: 161) reports, in a second survey involving two speakers, Bocci & Avesani (in preparation) found that pre-boundary lengthening on left-peripheral contrastive foci were significantly longer than the pre-boundary lengthening on subjects of broad focus utterances. However, Bocci also reports that the pre-boundary lengthening on contrastive foci was also significantly shorter than that found on clause-initial contrastive topics. He concludes that put together, these results should be interpreted as showing that contrastive foci are only followed by a phonological phrase boundary, not an intonational phrase boundary.

It is important to note that the results and their interpretation should be taken with caution for at least three reasons. First, the two experiments together only involved three speakers. Second, it is questionable whether pre-boundary lengthening can be used in this gradient way to determine the nature of prosodic boundaries, i.e. with longer lengthening being associated with intonational phrase boundaries and shorter ones with phonological phrases. Third, the crucial data would be to compare the size of the pre-boundary lengthening on left-peripheral foci and on string-medial or string-final foci, as there is full consensus that the latter two are followed by an intonational phrase boundary. This comparison is, however, not supplied.

Nevertheless, taking Bocci's conclusions at face value, let us acknowledge the possibility that not all cases of left-peripheral focus occur at the right edge of an intonational phrase, with postfocal material prosodically or syntactically dislocated. A similar position is defended in a series of papers by Bianchi (2013; 2015) but on syntactic and semantic grounds. I will return to these cases in section 4 and show that such cases are not instances of focus movement driven by prosodic well-formedness constraints but instances of left-edge contrast-related movement.
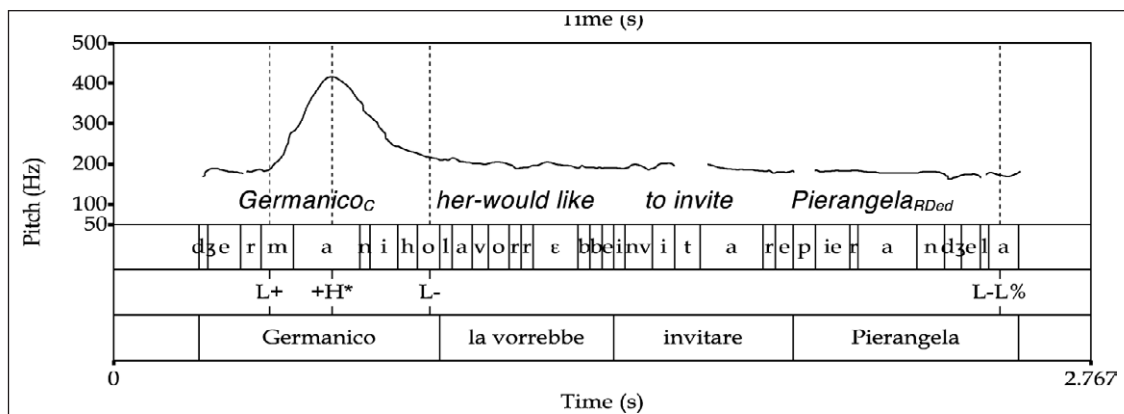
Figure 2: F⁰ contours of left-peripheral focus followed by main clause involving right-dislocated noun phrase from Bocci & Avesani (2011: 1359, Figure 1).

3.2 English Heavy NP Shift

Following Rochemont (1978), and Culicover & Rochemont (1990), Williams (2003) argues that focus is implicated in Heavy NP Shift (HNPS) in English. As the example in (16) shows, either of the arguments can be focused in the neutral order, while the shifted argument must bear focus (or be part of the focus) if HNPS is involved.

(16)   Williams (2003: 34, example 11)
        a.   John gave to Mary all of the money in the SATCHEL.
        b.   *John gave to MARY all of the money in the satchel.
        c.   John gave all the money in the satchel to MARY.
        d.   John gave all of the money in the SATCHEL to Mary.

Somewhat later, he explains that the positioning of HNPS is associated with the stress system of English. The NP appears in the position that it does because that is the neutral position for main stress, so a natural position for focus. In this way, HNPS can then be seen as an instance of driven movement, although Williams argues it is not the result of syntactic movement, but a misalignment between different levels of representation in syntax. Assuming a more traditional syntactic analysis, we may assume that the shifted NP adjoins to VP.

Given Hamlaoui & Szendrői's (2015) syntax-prosody mapping, the prosodic phrasing that will apply to such a structure is given in (17). This is because Infl is syntactically active in English, so IP is the "clausal" node in simple declaratives.[9]

(17) $(_{\iota}$ φ   φ   **φ**   )
        $[_{IP}$ John $[_{VP}$ $[_{VP}$ gave t_{NP} to Mary] all of the money in the SATCHEL]

English has rightward-oriented stress, like Italian, so the prosodic constraints have the same ranking as proposed above for Italian (i.e. (13)). It is easy to verify that given such a ranking the optimal candidate will be the one that places main stress on the final, shifted NP, indicated with bold in (17).

Although Williams (2003) does not demonstrate this, we can note that the accent can be shifted to the left within the shifted NP. This means that the accent may be not rightmost within the phonological phrase corresponding to the shifted NP, but it must still be on a word inside the rightmost phonological phrase. The slightly awkward question in (18) can be answered with a shifted NP.

(18)   Q: How much of the money that John keeps in the satchel did he give to Mary?
        A: John gave to Mary ALL of the money in the satchel.

Note the difference between right-dislocated elements in Italian and heavy NP-shift in English. The former is deaccented, or at least never the recipient of main stress, the latter is very much so – accent cannot be shifted away from the shifted NP. This falls out from Hamlaoui & Szendrői's (2015) analysis due to the different positions they occupy with respect to the finite verb. Right-dislocated elements in Italian sit structurally higher than the finite verb, since they are adjoined to IP, while the finite verb is in I. NPs undergoing HNPS in English sit in a structurally lower position than finiteness, due to their VP-adjoined position and the active I node in English. It is the flexible nature of the

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[9] There is a host of evidence available to the learner that shows that the Infl-node is syntactically active in English, and thus that simple declarative clauses are IPs in English, despite the lack of V-to-I. For instance, auxiliaries, which bear finiteness if they occur, sit in I. The EPP ensures that [Spec, IP] is always filled, and the I-head must be filled by *do* in negatives and questions if no other auxiliary is present.

syntax-prosody mapping of Hamlaoui & Szendrői (2015) that make it sensitive to such relative syntactic relations between the position of the moved or dislocated element and the finite verb.

3.3 Typological predictions

So far, I have followed Hamlaoui & Szendrői's (2015) proposal that left-peripheral focus in Hungarian can be explained by a set of syntax-phonology mapping constraints that refer to the highest position the verb or verbal material overtly fills. I went on to show that the same scenario can accommodate string-final and string-medial (and partly left-peripheral) focus in Italian, and heavy NP shift in English can be subsumed under the same analysis.

Let us now explore some specific typological implications of the proposal. First, any movement of a focal constituent that happens with the aim of satisfying the *Stress-Focus correspondence principle* (4) must target the position where main stress falls. If such movement targets a left-peripheral specifier position, like in Hungarian, then it must be accompanied by verb movement to the corresponding head position. As already stated by Hamlaoui & Szendrői (2015), in the absence of verb movement the left-peripheral element will fall outside the innermost intonational phrase by the syntax-phonology mapping constraints in (5). This is illustrated by the schemata, repeated here from (6). If verb-movement accompanies the movement of the focus, the intonational phrase will encompass the focus as its leftmost phonological phrase. If the verb does not move, the innermost intonational phrase, which is the effective domain of main stress assignment, will not contain the moved element. Since a focus most bear main stress, by (4), moving it to a position where it would be mapped outside the innermost intonational phrase makes no sense.

(6)   Hamlaoui & Szendrői (2015: 83, example 5)
    a. $(_\iota$ XP V ... t_V ... $t_{XP})$ see (7)
    b. $(_\iota$ XP ...$(_\iota$ V ... $t_{XP}))$

So, in this light, Hungarian and Italian left-peripheral focus movement is qualitatively different, since the former involves verb movement while the latter (to the extent that it involves A-bar movement to the left-periphery) does not. The former is driven by a need to satisfy the Stress-focus correspondence principle (4), the latter does not seem to be. This is because in the absence of verb movement, the innermost intonational phrase does not normally encompass a left-peripheral element. I will return to Italian left-peripheral focus movement in section 4.

The typological prediction following from this state of affairs is that leftward-oriented movement operations effecting foci are always accompanied by verb movement, or they target a position no higher than the position that the finite verb moves to independently.

The situation is just the opposite on the right-periphery. Here, due to the mapping constraints and prosodic constraints (5, 13), the target position of the focal element must be structurally lower than the position of the highest verbal element in the structure. As the schemata in (19) illustrate, if the verb moves to a position structurally higher than the right-peripheral focus, the latter will be rightmost in the innermost (or only) intonational phrase, thereby well-positioned to receive main stress. This is what happens in English Heavy NP Shift, as I argued above. In contrast, an operation that places an element to a position structurally higher than the moved verb, will that element the innermost intonational phrase, and thus make it unreachable for main stress. This, I argued, applies to right-dislocated elements in Italian.

(19) a. $(_\iota$ V ... t_V ... t_{XP} XP)   e.g. English HNPS
      b. $(_\iota$ $(_\iota$ V ... t_{XP}) XP)   e.g. Italian CLRD

There are two consequences of this state of affairs, typologically speaking. First, we do not expect HNPS-style movement in languages with no active Inflection-head, or with no V-to-I. Second, we also do not expect HNPS-style movement to target an IP-adjoined position (unless the finite verb moves to C, of course). Whether these typological predictions hold, one would need to ascertain by studying a wide range of different languages. For the moment, we must contend with simply formulating the predictions themselves, leaving their verification or falsification for future research.

In sum, several typological generalisations can be formulated based on the proposal that so-called focus movement is really movement of a focal constituent to a position that, due to the specific constraints proposed for the syntax-phonology mapping of clauses, can easily bear prosodic prominence. In the proposed system, it is predicted that left-peripheral focus movement would always be accompanied by verb movement, while rightward-oriented foci are predicted to always occur in a position structurally lower than the highest position of the finite verb in the clause.

Let us go one step further and enumerate the logically possible schemata that would give rise to potential structures for driven "focus movement". In other words, let us consider all the logical possibilities where a moved XP would be phrased as the leftmost or rightmost constituent inside the core intonational phrase. These are given in (20).

(20) a. $(_\iota$ XP V ... t_V ... t_{XP})   → Hungarian left-peripheral focus movement
      b. $(_\iota$ V ... t_V t_{XP} ... XP)   → Italian right-peripheral focus; English HNPS
      c. i. $(_\iota$ XP ... t_{XP} t_V V) or
          ii. $(_\iota$ ... t_{XP} t_V V XP)   → rare or unattested
      d. i. $(_\iota$ ... XP V)   → perhaps Turkish or Japanese
          ii. $(_\iota$ $(_\iota$ ... V XP) ...)   → perhaps IAV in Bantu/Chadic

Besides the two schemata I discussed in the earlier sections, (20a, b), there are two further structures that we need to mention. I am not in the position to study these here in detail, but they are clearly promising avenues for future research. First, it is conceivable that a language might have a left- or right-peripheral high focus position with verb movement to a high right-peripheral position accompanying the moved focus. This possibility is schematized in (20ci) and (20cii), respectively. I have not found a language that would illustrate this possibility. This might simply be due to the relatively low number of languages that have verb movement to a high right-peripheral position, and even fewer (possibly none) where a high functional position would project a rightward specifier as in (20cii).[10] At the same time, it is possible that this is not an accidental gap, but rather it is the case that languages that are so strictly head-final in their character that they would have verb movement to the right to a high position would always have another way of ensuring appropriate position for their foci. In particular, in strict OV languages it has been argued that there is a freedom of base-generated orders in the VP (Neeleman 2014). This means that such languages may in fact utilise the structure in (20di) to base-generate the focal constituent in the rightmost position within the clause (save the verb) and thus ensure that it is in a position to receive main stress in its base-generated position. Possibly, such a scenario could be argued to occur in languages like Turkish or Japanese.

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[10] Note that I omitted the structural possibility where the focus moves to a rightward specifier while the verb moves to the head position of that projection but on the left-periphery. Functional rightward specifiers are exceedingly rare, are in head-initial languages.

Finally, I would like to speculate that the structure in (20dii) might be exhibited by the IAV (Immediately After the Verb) focus position familiar from many Bantu and Chadic languages. Such languages are strictly VO, but sometimes they allow for structures where the verb appears in a position immediately left-adjacent to the focal constituent (perhaps syntactically forming a VP-shell). The prosodic characteristics of such constructions would need to be investigated in detail to see if there is indeed a right intonational phrase boundary following such foci, as is predicted by the proposed schema.

To sum up, so far I explored the typological predictions of the proposal that in certain languages, the focus-correspondence principle is satisfied by syntactic means, by focus movement to a position that would normally receive prosodic prominence by the stress rules of the language. What lies at the heart of the unified analysis of the constructions discussed above is that they all exhibit verb movement. This is exploited by the syntax-phonology interface, which by definition, takes "clause" to be the highest projection whose head is overtly filled by the verb or verbal material for the purposes of determining intonational phrase edges (Hamlaoui & Szendrői 2015). The current proposal makes some testable typological predictions. It is expected that left-peripheral "focus movement" always has accompanying verb movement; that topic movement never does; and that heavy NP shift always targets a position that is structurally lower than the surface position of the finite verbal material.

3.4 On optionality

The inability to account for optionality in the area of focus-movement was identified in section 1 as one of the major conceptual shortcomings of the cartographic approach. Let us now take a closer look as to how the present approach fares with respect to this issue.

In the proposed approach, focus movement is motivated by the interface requirement that foci must bear main stress (i.e. *Stress-focus correspondence principle* (4)). In Hungarian, where stress-assignment is left-aligned, movement may target the position that will occupy the leftmost phonological phrase inside the intonational phrase, once the syntax-prosody mapping takes place. Similarly, in English, heavy NP shift can place a constituent into a position that will correspond to the rightmost phonological phrase inside the intonational phrase, which is where nuclear stress is assigned in English. But this is not the only way to satisfy the interface requirement in (4). Another option would be to leave the focal constituent in situ and give prosodic prominence to that position by a marked prosodic operation, stress shift (Reinhart 1995; 2006). If stress shift takes place then the main stress is not edge-aligned, but rather, it occurs string-medially. Such an option is dispreferred in many languages, or at least restricted to certain syntactic configurations.[11]

In Hungarian, for instance, stress shift may occur inside a noun phrase if the nominal head, as opposed to the whole noun phrase is focused, but the whole noun phrase must move to the left-peripheral focus position, cf. (21a) vs. (21b). Szendrői (2003) argued that this state-of-affairs arises because it constitutes the most optimal prosody, with no violation on ENDRULE-L and a violation on its phonological phrase equivalent ENDRULE-L (φ), which favours left-alignment of stress within the phonological phrase. A compliance with ENDRULE-L (φ) cannot be achieved as split NPs involving modifying adjectives are not possible in Hungarian (see 21c).

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[11] Technically speaking, the choice between stress shift and syntactic reordering would be regulated by the relative ranking of the prosodic stress constraints (END-RULE L/R) and whatever constraints regulate syntactic movement (i.e. syntactic rules or soft constraints such as *STAY).

(21)   Adapted from Szendrői (2003: 58, example 25)
a.   [Péter [$_{FP}$ [$_{NP}$ egy   használt   AUTÓT] vett   t$_V$ t$_{NP}$]],   nem
Peter   a   second-hand car.ACC bought   not
egy (használt)   tévét.
a (second-hand)   telly
'Peter bought a second-hand car, not a (second-hand) telly.'

b.   *Péter vett   egy használt   AUTÓT, nem egy (használt)   tévét.
Peter bought a   second-hand car.ACC not a   (second-hand) telly
'Peter bought a second-hand car, not a (second-hand) telly.'

c.   *[Péter   [$_{FP}$ AUTÓT   vett t$_V$ [$_{NP}$ egy   használt t$_N$]], nem egy
Peter   car.ACC bought   a   second-hand not   a
(használt)   tévét .
(second-hand)   telly.
'Peter bought a second-hand car, not a (second-hand) telly.'

An instance where there seems to be optionality between stress shift and syntactic move-
ment concerns focused universal quantifiers and also-phrases in Hungarian. Verb-adjacent
foci in Hungarian come with a complicated semantic-pragmatic exhaustivity and con-
trastivity implicature, which is incompatible with the semantics of universal quantifiers
and also-phrases (Szabolcsi 1994). As a consequence, such elements cannot appear in the
verb-adjacent, left-peripheral position (see (22b)). Since they are nevertheless focused,
such elements must bear main stress (by (4)). There are two possibilities: they either
remain in situ and bear stress by stress shift (as in (22c)) or they are fronted to a position
preceding the highest position of the verb (22a).[12] As Hamlaoui & Szendrői (2015) note,
in the latter case there is a misaligned syntax-prosody mapping, so the focal element is
encompassed by the intonational phrase despite the absence of verb movement. Such
misaligned mapping is not freely available, it can only be applied due to the semantic
incompatibility between such elements and the verb-adjacent position.

(22)   (adapted from Hamlaoui & Szendrői 2015: ex. 31)
a.   A   vizsgán   mindenki MINDENT   megoldott egy óra   alatt.
the exam.on everyone everything.ACC PRT.solved an   hour   under
'At the exam, everyone solved EVERYTHING in an hour.'

b.   *A   vizsgán   mindenki MINDENT   oldott meg egy óra   alatt.
the exam.on everyone everything.ACC solved PRT an   hour   under
'At the exam, everyone solved EVERYTHING in an hour.'

c.   A   vizsgán   mindenki megoldott MINDENT   egy óra   alatt.
the exam.on everyone PRT.solved everything.ACC an   hour   under
'At the exam, everyone solved EVERYTHING in an hour.'

In other languages, like Portuguese, edge-alignment of stress is normally preferred (even
if it involves syntactic displacement) but stress shift is possible in certain specific cases.
In such cases optionality arises. This is the case, for instance, in the ditransitive construc-
tion: the direct object can be focused in situ, with stress shift (23a), or it can be moved to
a right-peripheral position to receive neutral, right-aligned stress (23b).

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[12] It is possible that (23a) is in fact an instance of contrast-related movement, as discussed in section 4. Note
that such an analysis would be consistent with the fact that the elements that can undergo fronting and be
stressed by misaligned mapping are scope-taking elements (universal quantifiers and also-phrases), they
bear a contrastive interpretation, marking the sister constituent as the scope, or domain of contrast, of the
fronted element. I will leave the exploration of this possibility for future research.

(23)　　Adapted from Costa & Szendrői (2006: example 6)

　　a.　O　　João　só　　atirou　A　CADEIRA　ao　　　Pedro.
　　　　the　João　only　threw　the　chair　　　to.the　Pedro
　　　　'It was only the chair that João threw to Pedro.'

　　b.　O　　João　só　　atirou　ao　　　Pedro　A　　CADEIRA.
　　　　the　João　only　threw　to.the　Pedro　the　chair
　　　　'It was only the chair that João threw to Pedro.'

Similarly, Neeleman & Reinhart (1998) showed that in Dutch, scrambling may be applied to constituents that are discourse-given, instead of deaccenting. Arguably, the same is true of Czech more generally. In Czech, givenness marking by syntactic reordering and by prosodic deaccenting is in free variation (Šimík & Wierzba 2015). In these languages, again, albeit in a different domain, syntactic means are employed instead of prosodic means to achieve interface compliance.

On the other side of the typological spectrum, languages like English have severe syntactic restrictions, but prosodic flexibility. In English, focusing is normally achieved by stress shift and not by syntactic movement, except in the case of heavy NP shift. (Also, there is no possibility of scrambling, but deaccenting can apply to even larger constituents, such as VPs.)

Overall, focus movement appears to be one of the options available to natural language in order to satisfy the *Stress-focus correspondence principle* in (4) – the other option being prosodic stress shift. These options may not necessarily be in free variation in a particular language, where a preference for one or the other may be clear. But even in such cases, the normally dispreferred option emerges when independent (syntactic or semantic) considerations preclude the application of the default. The proposed analysis allows for treating prosodic stress shift and focus movement on a par by treating the latter as movement targeting the position neutral stress is assigned. In a cartographic approach, the link between the two is severed. There is no conceptual link between the availability of prosodic stress shift and the presence or absence of a designated functional position for Focus. The current proposal establishes this conceptual link by regarding focus movement and stress shift as different possible ways to satisfy the interface requirement that foci must bear prosodic prominence.

4 Contrast-related movement to the left edge

Let us now return to Italian left-peripheral focus movement. In section 3.1, I explained that Samek-Lodovici (2015) provides an analysis of left-peripheral focus in Italian in which all post-focal material including the finite verb phrase is right-dislocated both prosodically and syntactically. Although this seems to be the right analysis for many cases of left-peripheral focus, there are two reasons why it is unlikely to explain all instances of it. First, there is conflicting prosodic evidence about the presence or absence of an intonational phrase boundary the focal element, while Samek-Lodovici's (2015) analysis would always predict an intonational phrase boundary. Second, the pragmatic meaning and syntactic distribution of left-peripheral focus and string-final and string-medial focus is not exactly the same. In particular, in a series of papers Bianchi (2013; 2015) has argued that left-peripheral focus in Standard Italian has a mirative or corrective import, and that it can only occur in clauses that have the potential to update the discourse, so typically root and also in so-called embedded root. These differences are unexpected under Samek-Lodovici's (2015) proposal, which treats string-medial and left-peripheral focus essentially the same way.

Cruschina (2011) provided an analysis of Italian left-peripheral focus, which recognises some of the differences between the Italian and the Hungarian case. He noted that Italian

left-peripheral focus and Hungarian left-peripheral are qualitatively different with only the latter requiring adjacency between the fronted focus and the finite verb. He proposed to account for this distinction in the cartographic framework, by proposing that the two are attracted to different functional head-positions: Italian focus to $CFoc^0$, and Hungarian focus to $IFoc^0$. He also proposed that $IFoc^0$, but not $CFoc^0$ attracts the verb. But he does not provide an explanation as to why it is $IFoc^0$ and not $CFoc^0$ that attracts the verb rather than the other way around. It is simply assumed that this is the case.[13]

Another issue with introducing two different functional focus heads ($IFoc^0$ and $CFoc^0$) is that this affects the original account of uniqueness of focus in Italian: Rizzi's (1997) showed that there can be many left-peripheral topics, there is never two foci in an Italian sentence (see also Cinque & Rizzi's 2008 discussion around example (5)). Uniqueness of focus on his account simply followed from the assumption that there is only one focus position. If, however, there are two, one to host contrastive foci and one to host new information foci, then uniqueness no longer follows.

Finally, the idea of two focus positions also raises a further issue. Take a dialect that is alleged to have both positions active, such as Sicilian, according to Cruschina (2011). In Sicilian, a focus sitting in the left-peripheral $CFoc^0$ position (non-adjacent to the verb) must be contrastive, cannot just be a new information focus. But the reverse is not true: a focus sitting in [Spec, $IFoc^0$] can be contrastive. To account for this asymmetry, Cruschina proposed that [contrast], the feature attracted to $CFoc^0$, "appears to be a subtype of focus feature" (Cruschina 2011: 156). So, both can be attracted to $IFoc^0$, while only the more specific [contrast] is attracted to $CFoc^0$. But this introduces a new notion in grammar: features on features. As Neeleman et al. (2009) explain, such a move means that features are no longer atomic units in the grammar. In this regard, it seems preferable to assume that feature bundles (e.g. [contrast] + [focus]) can be attracted by specific heads (i.e. $CFoc^0$), while the single feature [focus] is attracted to $IFoc^0$. In this case, one would need independent evidence for positing the feature [contrast]. This seems possible: for instance, Molnár (2001) and Molnár & Winkler (2010) argue for the existence of such a feature (and a designated position, $Kontrast^0$) in Finnish.[14]

I agree with Cruschina's (2011) analysis that it is the contrastive character of the Italian left-peripheral focus that is responsible for its displacement, but I do not think it is necessary or helpful to assume a designated syntactic position to host the contrastive element. An alternative to the cartographic treatment of contrast-related movement was proposed by Neeleman et al. (2009) (see also Horvath 2010; Neeleman & Vermeulen 2012). They propose that [contrast] and [focus] (and also [topic], but that is not relevant for the present paper) are "discourse notions" that can be "targeted by mapping rules operating between syntax and information structure" (Neeleman & Vermeulen 2012: 5). They may have "syntactic consequences" but they are not associated with designated positions.

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[13] There are attempts in the literature to identify fine-grained phonetic correlates of different types of focus, distinguishing new information focus from contrastive (or mirative or corrective) focus prosodically (see e.g. Selkirk 2002; 2008; Bocci 2013). To the extent that these are successful, which is not always clear that they are (see for instance Gyuris & Mády 2014 for a negative result on Hungarian contrastive vs. aboutness topics), this is often taken as supporting evidence for the cartographic approach. But this is in fact based on faulty logic. The prosodic characteristics of the different focus types, to the extent that they are systematically, never correlate with position, but with interpretation: a contrastive focus bears contrastive focal stress whether it is in a left-peripheral position or in a right-peripheral position. So, the fine-grained prosody-meaning correspondences are irrelevant for the syntax, and therefore cannot support syntactic arguments in favour of different designated positions.

[14] Note that the Sicilian sentences with only information focus that appear to move to a left-peripheral, verb-adjacent position, potentially constitute a case of focus movement. In order to substantiate or disprove this hypothesis one would need to study the prosodic characteristics of the moved elements as well as the postfocal material. This would take us too far afield, and is thus left for future research.

Rather, under the minimalist principle that "syntactic operations may be licensed by having an interpretative effect, movement can take place in order to feed a mapping rule associated with a particular discourse notion." (Neeleman & Vermeulen 2012: 5)

In Dutch, for example, both contrastive foci and contrastive topics, so any element bearing [contrast], may move to a position in the so-called middle field (or the left-periphery), as shown in (24) for contrastive foci.

(24)　　Neeleman & Vermeulen (2012: 27, example 54–56)

　　　a.　Ik　geloof　dat　[DIT　boek]$_1$　Jan　　Marie t$_1$　gegeven　heeft.
　　　　　I　believe　that　this　book　　John　Mary　　given　　has
　　　　　'I believe that John has given this book to Mary.'

　　　b.　Ik　geloof　dat　Jan　　[DIT　boek]$_1$　Marie t$_1$　gegeven　heeft.
　　　　　I　believe　that　John　this　book　　Mary　　given　　has
　　　　　'I believe that John has given Mary only this book.'

　　　c.　[DIT　boek]$_1$　zou　　Jan　　Marie t$_1$　geven.
　　　　　this　book　　would　John　Mary　　give
　　　　　'John would give Mary this book.'

There is no fixed landing-site for these movement operations: the more elements occur in the middle field (e.g. adverbials), the more the potential landing sites. The movement serves to mark the scope of the contrastive element: the sister of the moved element is what Neeleman et al. (2009) and Neeleman & Vermeulen (2009) call its "domain of contrast", as shown in (25). For ease of exposition, let us assume that the scope, or domain of contrast of a contrastive element XP is all the material in YP except for XP itself. As (25a) shows, if XP stays in situ, the domain on contrast is a discontinuous constituent made up of elements preceding and following XP inside YP. In (25b), however, where XP moved to a position marking its domain of contrast, its sister YP (including the trace of XP) is now a single syntactic constituent.

(25)　a.　$[_{YP} .... $　　　XP$_{contrast}$　　　　　　　　　$....]$
　　　　　part of DoC　contrastive element　part of DoC

　　　b.　XP$_{contrast}$　　　　　　　　$[_{YP} .... $ t$_{XP}$ $....]$
　　　　　contrastive element　DoC

So, the motivation for contrastive fronting is to create a syntactic constituent in surface syntax that corresponds to the scope of the contrastive element, i.e. to mark its domain of contrast. The movement is licensed because it facilitates a simple mapping between syntax and information structure, according to Neeleman et al. (2009) and Neeleman & Vermeulen (2012). As a result of the movement operation, there are syntactic constituents corresponding to the contrastive element and to its scope. The movement ensures that the surface syntactic representation of the contrastive element and its domain of contrast reflect their LF scope relation (see also Bobaljik & Wurmbrand 2012 for a similar proposal about quantifier raising more generally).

Note that this kind of movement is optional. There is no need to mark the domain of contrast in syntax, just as there is no need for quantifiers to mark their scope in surface syntax. But if movement takes place, it can only effect elements that are contrastive (i.e. elements that can take scope), and the landing site of the movement determines the domain of contrast for the contrastive element.

Let us investigate the prosodic characteristics of contrastive movement. Here, as above, I will restrict myself to cases involving contrastive foci. The prosodic characteristics of fronted contrastive topics are distinct, and they would lead us too far afield to discuss

them. Foci that undergo contrastive fronting are subject to the *Stress-focus correspondence principle* in (4). In languages like Dutch, this is achieved by stress shift: a positioning of the main stress to a position other than the nuclear stress position. By default, Dutch, like English and Italian, places main stress on the rightmost phonological phrase in the intonational phrase. But stress shift may apply, and position the main stress on another phonological phrase.

In recent work, Büring (2015) developed a semantic analysis that links the prosodic notion of stress shift to marking the scope of a contrastive focal element in the semantics directly. He proposes that when stress shift applies, the semantic computation of the focal alternatives will be such that the sister constituent of the element with marked stress will be backgrounded or discourse given. In Neeleman et al.'s (2009) and Neeleman & Vermeulen's (2012) terminology, the sister constituent is the domain of contrast. (See also Wagner's 2007; 2012 proposal for arguments that the sister of a marked stressed constituent is backgrounded, or given). If this is on the right track, and the semantics of focus is sensitive to the nature of the prosodic stress (i.e. nuclear vs shifted), then we can explain the prosodic characteristics of contrastive movement as follows. The contrastive element may move to a fronted position, to mark its sister as its domain of contrast. A prosodic operation of stress shift must accompany the syntactic operation of fronting, placing main prominence on the fronted contrastive focus. This way the fronted focus will satisfy the *Stress-focus correspondence principle,* and the resulting prosodic structure can feed directly into the semantics of focus, to derive the correct focal meaning.

Dutch is remarkably flexible in that it allows numerous landing sites for contrastive elements in the left-periphery and the middle field. If the line of thought presented here is on the right track, Dutch owes this flexibility to two factors: to the flexibility of its syntax, which provides landing sites in the middle field (i.e. aka scrambling) and to the flexibility of its prosody, namely that stress shift can shift the main prominence to virtually any position inside the intonational phrase. Other languages seem to be more restrictive. I would like to propose that in certain languages a prosodic restriction applies to restrict the possible landing sites of contrastive fronting. In particular, I will argue that this is the case in the case of the Italian left-peripheral focus construction.

It is well-known that in languages like Italian, stress shift inside the intonational phrase is severely restricted (e.g. Samek-Lodovici 2006). Nuclear stress is right-aligned, and marked stress may be left-aligned, but the head of the intonational phrase cannot occupy a phrase-medial position (see e.g. Frascarelli 2000). As a result, contrastive movement cannot target a medial position in the intonational phrase because that would result in a prosodically ill-formed utterance. Rather, contrast-related movement targets a left-peripheral position syntactically, and gives rise to a misaligned syntax-phonology mapping. In other words, some of the syntax-prosody mapping constraints in (5) are violated (under pressure by a higher-ranked constraint that favours operators marking their scope on the surface and the stress-focus correspondence principle). The intonational phrase is exceptionally enlarged to include the contrastive constituent at its left edge. The misaligned mapping places the contrastive element in an edge-aligned position (see also Molnár & Winkler 2010). The corresponding schema is given in (26).

(26) $(_\iota \textbf{XP} \dots [\text{ V} \dots t_{XP}])$

The moved contrastive element, which bears main stress, is prosodically marked, since it is the result of a misaligned syntax-phonology mapping. In particular, among the constraints responsible for the mapping (i.e. (5)), ALIGN-L (HVP-ι) and ALIGN-L (ι-HVP) are both violated by the schema in (26). In addition, the utterance is also prosodically

marked in the sense that stress within the intonational phrase is left-aligned, rather than right-aligned. So, the high-ranked EndRule-R is violated (in (13)).[15]

In this light, we can make a crucial distinction between contrast-related movement and focus movement in the sense that only the latter targets the position where main stress falls by the syntax-phonology mapping and the stress assignment rules. But there is also one thing they both fronted contrastive foci and foci undergoing focus movement bear the main stress of their utterance (the former by default, the latter by a marked prosodic operation resulting in left-aligned stress). This gives a way to account for the uniqueness of focus in Italian. The reason is prosodic: Italian does not allow two main accents. Since both the right-peripheral and the left-peripheral focus, a prosodic restriction on their co-occurrence is naturally stated. It is, of course, also possible to maintain a cartographic analysis of the two constructions while accepting that uniqueness is due to prosodic reasons. But prosodic restrictions do not normally have an effect on the syntax of a language (i.e. forcing that only one functional position can be filled). It is the prosodically relevant nature of these positions that make syntax vulnerable to prosodic effects in this domain. If the positions are semantically motivated in a cartographic fashion, this link is lost.

To sum up, in this section I argued that left-peripheral Italian focus is an instance of contrast-related fronting in Neeleman et al.'s (2009) and Neeleman & Vermeulen's (2012) sense. It is motivated by marking the scope of the contrastive element in surface syntax. Since it affects a focal constituent the fronted element must bear stress. In Italian, where stress shift is not freely allowed, this places a restriction on the position the fronted element can target. In terms of the syntax-prosody mapping a misaligned mapping applies, and in the prosody, left-aligned marked stress is assigned to the contrastive element. It follows from this analysis that Italian left-peripheral movement is not and thus no verb-adjacency requirement is expected. It also follows that Italian left-peripheral movement is pragmatically marked, contrastive (or mirative or corrective). Contrastivity is in fact the underlying motivation for its displacement. In this respect, the proposed analysis agrees with Cruschina's proposal. I do not, however, endorse the idea of a designated position for contrastive foci, partly because of languages like Dutch, where a multitude of such positions is necessary, partly because it seems to me that in a language like Italian, the prosodic organisation of the clause can give insight into the position targeted by the contrastively fronted element. The importance of prosodic considerations in the analysis has the added benefit of providing an account for the uniqueness of focus in Italian: there is only one main stress allowed in this language, hence only one focus position can be targeted in any utterance.

5 Summary and conclusions by way of revisiting the differences between Hungarian and Italian focus movement

In this paper I argued that a better understanding of Hungarian and Italian left-peripheral focus movement is obtained if they are taken to be instantiations of two distinct type of movements, focus movement targeting the nuclear stress position and contrast-related movement to the left edge, respectively. In terms of the syntax-phonology mapping, the former is a manifestation of an optimal syntax-phonology mapping of the clause, while the latter is a case of misaligned mapping. I followed Hamlaoui & Szendrői (2015) in proposing that the notion of "clause" should be understood to refer to the highest position the verb or verbal material overtly fills. I showed how this provides a unified analysis for

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[15] In languages that allow main stress to be string-medial, like Dutch, both EndRule-L and EndRule-R are violated, but ALIGN-L (HVP-ι) and ALIGN-L (ι-HVP) are satisified.

Hungarian left-peripheral focus, Italian string-final and string-medial focus and heavy NP shift in English as instances of movement driven by a need to satifsfy interface needs, in particular, the *Stress-focus correspondence principle.*

I indentified three differences between the Hungarian and Italian left-peripheral focus constructions whose explanation follows from the proposed analysis. First, Hungarian but not Italian focus movement is accompanied by verb movement. This follows from the analysis because the presence of verb-movement allows the focus in Hungarian to target a position where nuclear stress is assigned. This is because the syntax-prosody mapping principles are sensitive to the surface position of the verb. In Italian, since the movement is motivated by scope, rather than by prosody, there is no reason for accompanying verb movement. Note that this does not mean that verb movement is precluded in such situations, although it is interesting to note that to the best of my knowledge scope-driven movement is generally not accompanied by verb movement. For instance, Hungarian is known for displaying quantifier raising in its overt syntax. But this is not accompanied by verb movement.

The second difference is that Hungarian focus movement involves nuclear, default stress, while Italian focus is prosodically marked. I presented a detailed prosodic analysis showing that Hungarian left-peripheral focus and Italian string-final and string-medial focus, as well as English HNPS utilises the nuclear stress position of the language. In contrast, I argued that Italian left-peripheral focus is prosodically marked, as it is left-aligned within its intonational phrase (i.e. the position of the main stress in these clauses does not satisfy all the prosodic stress constraints).

The third difference is that Hungarian utterances with focus movement are pragmatically unmarked, while Italian left-peripheral focus is pragmatically marked. I speculate that the unmarked pragmatics is simply the result of the unmarked syntax-prosody mapping and the fact that focal stress placement coincides with the nuclear stress position. This can be thought of as a corollary of the *Stress-focus correspondence principle* in (4) in the sense that the function of prosodic prominence is to the hearer the focused constituent. As far as left-peripheral focus in Hungarian is concerned, it can be uttered in new information contexts, as shown in (27). In fact, this is the default way one answers a *wh*-question in the language. Note that the focus in the answer is interpreted exhaustively (Szabolcsi 1994), but nevertheless, its pragmatic function is simply to provide new information. So in this sense, it can be understood to be pragmatically unmarked.

(27)   A: Kit   szeretett meg Mari?
            Who-ACC loved   PRT   Mary
            'Who did Mary fall in love with?'

       B: ($_{\iota}$ [$_{FocP}$ Péter t$_i$ szerette$_j$ [$_{PredP}$ meg t$_j$ [$_{VP}$ Mari t$_i$]]])
            Peter.ACC loved   PRT   Mary
            'It was PETER that Mari fell in love with.'

Similarly, Italian string-final and string-medial focus is not necessarily contrastive. Rather it can be used to provide an answer to a corresponding *wh*-question as illustrated above in (10). Heavy NP shift in English has been argued to affect focal constituents (Williams 2003) but as the name suggests prosodic weight is also a contributing factor. There is certainly no sense of contrastivity required, the NP undergoing heavy NP shift can be a simple new information focus. Again, unmarked prosody does not give rise to consistently marked pragmatics. Naturally, in all these cases contrastive accent can be present on the moved constituents, in which case contrastive pragmatics is licensed. The point is that the constructions are all well-formed in the absence of contrastive prosody or marked pragmatics.

In contrast, if we treat contrastive movement as one that occurs to satisfy an interface need relating to contrastivity and its scope, and where the prosodic domain is enlarged in a way that goes against the neutral syntax-prosody mapping constraints, with non-neutral (left-peripheral) stress placement, it follows that such an operation can only target pragmatically marked constituents (contrastive, corrective or mirative). I also showed that prosodically speaking, contrastive fronting involves marked stress: left-aligned stress in Italian and stress shift in Dutch. Büring (2015) proposed that the marked nature of the stress feeds directly into the focal semantic meaning, deriving the contrastive meaning of the fronted element taking scope over its sister constituent. If this view is on the right track, then it is the marked prosody that is responsible for the marked pragmatic (i.e. contrastive) meaning.

In addition to deriving the above distinctions, I also explored the typological predictions of the proposed analysis of focus movement, based on Hamlaoui & Szendrői's (2015) proposal. This predicts that left-peripheral focus movement will always be accompanied by verb-movement. In addition, rightward-oriented focus positions must occupy a position structurally lower than the overt position of the finite verb. I also briefly mapped out some further possibilities for future typological work in this area. Overall, I hope to have shown that it is possible to formulate restrictive and powerful analyses that can account for syntactic generalisations in the area of focus movement without recourse to a syntactic [+focus] feature or any designated functional projections.

Abbreviations

1 = first person agreement, 2 = second person agreement, 3 = third person agreement, ACC = accusative, DAT = dative, PL = plural, PRT = particle, SG = singular

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The author has no competing interests to declare.

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