

# A flexible approach to the syntax-phonology mapping of intonational phrases

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**Abstract** This paper addresses ‘a central question for [...] any theory of the syntactic-prosodic constituency relation’ (Selkirk, 2011, 17): how to best characterize the notion of ‘clause’ in ALIGN/MATCH constraints related to the syntax-prosody mapping of the intonational phrase. We propose that the notion of ‘clause’ should be determined in each construction by making reference to the highest projection in the root clause (see Downing, 1970), to which the verbal material (i.e. the verb itself, the inflection, an auxiliary, a question particle) is overtly moved or inserted, together with the material in its specifier. In other words, we argue that no particular functional head plays a role in the theory of intonational phrasing. In support of this flexibility in syntax-prosody mapping, we discuss data from the Bantu language, Bàsàá, and the Finno-Ugric language, Hungarian. We show that a left-peripheral constituent may be prosodically outside the core intonational phrase even though its syntactic position is relatively low, so long as the verb is even lower, and that conversely, a constituent may be phrased inside the core intonational phrase even if it is in a syntactically high position, so long as the verb also moves high.

## 1 Introduction

### 1.1 What is a ‘clause’?

A number of studies have argued that the speech flow is organized into a finite set of hierarchically organized phonological domains more or less reflecting syntactic constituency (Selkirk, 1978, 1986; Nespor and Vogel, 1982, 1986, among others). Above the word level, at least two prosodic levels are usually assumed: the phonological phrase and the intonational phrase. It is widely accepted that the phonological phrase is formed in relation to syntactic domains, that is lexical XPs (Truckenbrodt, 1999; Selkirk, 2011) or spell-out domains (Dobashi, 2003; Ishihara, 2003; Kratzer and Selkirk, 2007). Identifying the basis for the intonational phrase has been a more problematic enterprise. Not only syntactic but semantic and pragmatic factors have been argued to play a role. For instance, Selkirk (1984) proposed the Sense-Unit Condition, which makes reference to the semantic interpretation

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of the material involved. In more recent work, intonational phrases are said to match constituents that form speech acts (Selkirk, 2005; Truckenbrodt, 2014). Finally, some have argued that specific information structural roles influence phrasing: for instance, (dislocated) topics are said to constitute their own intonational phrase (Frascarelli, 2000; Feldhausen, 2010). Another line of thinking identifies the basis of intonational phrases in purely syntactic terms, as the prosodic reflex of the ‘syntactic clause’ (Downing, 1970; Emonds, 1970, 1976). Various realisations have been offered including Optimality Theoretic (OT) constraints (McCarthy and Prince, 1993) requiring Alignment or Wrapping of vP/TP/CP with intonational phrases (Zerbian, 2006; Truckenbrodt, 2007; Cheng and Downing, 2009). The notion of a clause is also central in the recent Match Theory (Selkirk, 2011), where MATCH-CLAUSE is defined as follows:

MATCH CLAUSE

A clause in syntactic constituent structure must be matched by a corresponding prosodic constituent, call it  $\iota$  [intonational phrase], in phonological representation.

Explicitly, Selkirk (2011) proposed that at least two notions of clause come into play: ‘the standard clause’ and the ‘illocutionary clause’. The standard clause is understood as “the constituent that is the complement of the functional head Comp. In modern syntactic theory,  $\text{Comp}^0$ , or simply C, is commonly assumed to introduce the canonical sentence, which consists of an explicit or an implied subject, a predicate and a locus for Tense:

$\text{CP}[\text{Comp}^0 \text{ [standard clause]}]$ .” The illocutionary clause “is the highest syntactic projection of the sentence and carries its illocutionary force, which determines its appropriateness in a discourse context (...); the syntactic structure for this clause type [is] assumed to be  $\text{ForceP}[\text{Force}^0 \text{ [illocutionary clause]}]$ ”. In a different paper (Selkirk, 2009), a slightly different formulation is given, where it is proposed that MATCH CLAUSE could apply to “the complement of any functional head of the [Rizzi (1997)-style] ‘complementizer-layer’ ” (i.e. TopicP or FocusP).

Our central question is how to best characterize the notion of ‘clause’ in constraints related to the syntax-prosody mapping of the intonational phrase. We propose that the notion of ‘clause’ should be determined in each language and each construction, by making reference to the highest projection in the root clause (see Downing, 1970), to which the verbal material (i.e. the verb itself, the inflection, an auxiliary, a question particle) is overtly moved or inserted, together with the material in its specifier. So, we argue that no particular functional head plays a role in the theory of intonational phrasing (*contra* most recent approaches). In support of this flexibility in syntax-prosody mapping, we discuss data from the Finno-Ugric language, Hungarian and the Northwest Bantu language, Bàsàá. In particular, we show that in these languages, certain phrases are in a high A-bar position while prosodically integrated (Hungarian, Section 2) and, conversely, that phrases can be syntactically low while prosodically non integrated into the core intonational phrase (Bàsàá, Section 3). What determines the prosodic phrasing is not syntactic position in itself but rather the relative position of the constituent with respect to the verb.

## 1.2 Flexible mapping constraints

Szendrői (2001) proposed that the following principles are operative at the syntax-prosody mapping of clauses:

- (1) *Syntax-prosody mapping of clauses* (Szendrői's original formulation, to be substantially revised)
- a. Align the left-edges of the largest extended projection of the V with the left-edge of an intonational phrase.
  - b. Align the left-edges of intonational phrase with the left-edge of the largest extended projection of the V.
  - c. Align the right-edges of the largest extended projection of the V with the right-edge of an intonational phrase.
  - d. Align all the right-edges of the intonational phrase with the right-edge of the largest extended projection of the V.

In this paper, we would like to preserve the original insight that 'clausehood' should mean the highest projection to which the verbal material (i.e. the verb itself, the inflection, an auxiliary, a question particle) is overtly moved or inserted, together with the material in its specifier. We will abbreviate this as HOPV, for highest overt projection of the verb. We will bring evidence for our proposal from Bàsàà and Hungarian.

Szendrői (2001) did not consider complex clauses and we also cannot do so here. Nevertheless, Downing (1970) (see also Truckenbrodt, 2014) proposed that root clauses seem to have a special role for the syntax-prosody mapping:

- (2) Obligatory Boundary Insertion (OBI):  
Phonological phrase boundaries are inserted as leftmost and rightmost immediate constituents of every root S node [...]. (Downing, 1970, 31)
- (3) Root sentence:  
Any sentence which is not dominated by a predicative sentence.  
(Downing, 1970, 30)

In today's language, the immediate effect of Downing's OBI rule would be that clauses that are not dominated by predicative material form their own intonational phrase. This would apply to main clauses, but not to complement or adjunct clauses. This seems to be the correct prediction for Hungarian and Bàsàà (see Szendrői and Hamlaoui, in prep). So, although none of the data discussed in this paper hinges on the difference between 'root' and 'non-root' clauses, as we only discuss simplex clauses here, for consistency's sake, we would like to propose the following four constraints in (4)ai to (4)aiv to determine correspondences between syntactic and prosodic units on the clause level. Note that nothing in the present paper hinges on the distinction between Alignment and Match Theory and that the label ALIGN is simply used to maximize consistency with the original proposal (Szendrői, 2001).

- (4) Syntax-prosody correspondences on the 'clause'-level
- a. *Syntax-prosody mapping*
    - (i) ALIGNHOPV-L: Align the left edge of the highest projection whose head is overtly filled by the **root** verb, or verbal material, with the left edge of an  $\iota$ .
    - (ii) ALIGNHOPV-R: Align the right edge of the highest projection whose head is overtly filled by the **root** verb, or verbal material, with the right edge of an  $\iota$ .
    - (iii) ALIGNSA-L: Align the left edge of a syntactic constituent sing illocutionary force with the left edge of an  $\iota$ .

- (iv) **ALIGNSA-R**: Align the right edge of a syntactic constituent expressing illocutionary force with the right edge of an  $\iota$ .
- b. *Prosody-syntax mapping*
  - (i) **ALIGN $\iota$ -L**: Align the left edge of an  $\iota$  with the left edge of the highest projection whose head is overtly filled by the verb or verbal material.
  - (ii) **ALIGN $\iota$ -R**: Align the right edge of an  $\iota$  with the right edge of the highest projection whose head is overtly filled by the verb or verbal material.

In addition, in (4)bi and (4)bii, we propose that, while root-clauses have a privileged status from the perspective of syntax-to-prosody mapping, all clauses are equal in prosody-to-syntax mapping. By distinguishing the syntax-to-prosody mapping constraints from the prosody-to-syntax ones, we do not propose that they apply at different places in the grammar. What distinguishes them from each other is simply their underlying motivations (see Szendrői and Hamlaoui, in prep, for more discussion). All six proposed mapping principles apply at the same time to determine syntax-prosody correspondences at the level of the ‘clause’.

### 1.3 Predictions of the flexible mapping constraints

Let us concentrate on our main claim, that is the fact that many of our mapping principles specifically refer to the overt syntactic position of the verb in the structure. This allows us to formulate generalizations about the syntax-prosody interface that are hard to formulate in other alternative frameworks that make rigid reference to specific syntactic projections (e.g. TP or CP). In particular, we predict that elements targeting specifier positions with accompanying verb movement will normally be internal to the core intonational phrase, as in (5-a). In contrast, elements occurring in a left-peripheral position in the absence of accompanying verb movement (or insertion) will prosodically sit outside of the core intonational phrase, as in (5-b).

- (5) a. ( $\iota$  XP V ...  $t$  ...  $t$ )
- b. ( $\iota$  XP ... ( $\iota$  V ...  $t$ ))

Specifically, we will show in Section 2 that the configuration in (5-a) arises in the Hungarian left-peripheral focus construction, see (6), where the V moves to a functional position in the C-domain, FocusP (Rizzi, 1997), and the focused element moves to its Specifier. In this example and the following ones illustrating our predictions, the verb is underlined and the syntactic brackets corresponding to the HOPV appear in bold.

- (6) ( $\iota$  [**FocP** Pétert<sub>i</sub> szerette<sub>j</sub> [**PredP** meg  $t_j$  [**VP** Mari  $t_i$ ]]) )
- Peter.ACC loved                   Prt           Mary
- ‘It was PETER that Mari fell in love with.’

The same prosodic phrasing applies in English *wh*-questions involving I-to-C movement, and German V2 clauses, see (7). In accordance with our proposed mapping constraints, when I-to-C or V-to-C movement occurs,  $\iota$  encompasses the whole CP. Crucially there is no evidence for the presence of a left edge of  $\iota$  following the finite verb ( $C^0$ ), as would be predicted by approaches that rigidly map TP to  $\iota$ , such as Zerbian (2007a) or Selkirk (2009, 2011).

- (7) ( $\iota$  [<sub>CP</sub> Nächtes Jahr wird<sub>i</sub> [<sub>TP</sub> der Hans  $t_i$  zum Glück eine reiche Frau heiraten]])  
 next year will the Hans with luck a rich woman marry  
 ‘Next year, Hans will luckily marry a rich woman.’ (adapted from Frey 2005)

In contrast, as we will demonstrate in Section 3, a specific construction in Bàsàá, termed here zero-coded passive left-dislocation, gives rise to the configuration in (5-b), see (8). This construction effectively topicalizes the object, but in a relatively low position, within the inflectional domain (Woolford, 1991; Hamlaoui and Makasso, 2013). Tonal processes show that the fronted topical object is outside of the core  $\iota$ .

- (8) ( $\iota$  [<sub>TopP</sub> tòlò<sub>i</sub> ( $\iota$  [<sub>TP</sub> síngâ<sub>j</sub> ì-ñ-ḡḡ<sub>k</sub> [<sub>vP</sub>  $t_j$   $t_k$  [VP  $t_k$  ]ḡḡ ]]])  
 1.mouse 9.cat 9.AGR-PST1-eat 1.PRO  
 ‘The mouse, the cat ate it.’  
 (= the mouse was eaten by the cat)

The proposed phrasing is unexpected in those proposals that associate CP with the  $\iota$  (Truckenbrodt, 2007; Henderson, 2012; Cheng and Downing, 2009; Pak, 2008, among others). In sum, we predict that it is the highest overt position that the verb occupies within the clause rather than some rigid syntactic category (CP, TP or vP) that is relevant for the mapping of  $\iota$ . So, when the fronting of an XP is accompanied by verb movement/insertion, the fronted XP and the verbal material are integrated into the core  $\iota$ . This is so, even if the targeted position is relatively high within the clausal hierarchy, as in Hungarian focus or German V2. This is unexpected in theories that rigidly use TP-to- $\iota$  mapping. Conversely, an XP can fall outside the core intonational phrase, even if it is relatively low in the tree, as passive left-dislocated phrases in Bàsàá, so long as the fronting operation is not accompanied by verb movement to the head position of the targeted specifier. This is unexpected in theories that rigidly use CP-to- $\iota$  mapping.

Finally, our proposal does not *a priori* distinguish information-structurally neutral sentences from sentences that are information-structurally marked, involving a non-canonical word order. It is not the topical or focal nature of a peripheral element that primarily determines whether it is phrased inside or outside the core intonational phrase (*contra* Selkirk, 2005; Downing, 2011, among other works), but rather, phrasing is dependent on the highest overt position of the verb.

Let us now turn to the empirical evidence in favor of the proposed flexible approach.

## 2 Evidence from Hungarian simple clauses

### 2.1 Hungarian non-neutral and neutral declaratives

Both traditional and more modern syntactic accounts of Hungarian classify simple clauses into so-called neutral sentences and non-neutral ones, involving a left-peripheral exhaustive focus (É Kiss, 2002). Let us take these in turn. As (9) shows, particle verbs (Prt-V) form right-headed morphological units in Hungarian, corresponding to a single phonological word. In out-of-the blue utterances without a topic, the Prt-V complex is situated at the left-edge of the clause with any arguments following it, (9-a). In utterances with topics, the topics precede the Prt-V complex. The subject is often in this position, as in (9-b), but various factors including referentiality, animacy and relative salience of the arguments in-

fluence whether an argument ends up in the preverbal topic position. In (9-c) for instance, the utterance sounds natural because the object is human, while the subject is not.<sup>1</sup>

- (9) a. [<sub>PredP</sub> Meg-jött [<sub>VP</sub> a vonat]].  
       PRT-came the train  
       ‘The train arrived.’  
 b. [<sub>TopP</sub> Péter [<sub>PredP</sub> meg-szerette [<sub>VP</sub> Mari]]].  
       Peter PRT-loved Mari-ACC  
       ‘Peter started loving Mari.’  
 c. [<sub>TopP</sub> A postást [<sub>PredP</sub> meg-harapta [<sub>VP</sub> a kutya]]].  
       The postman PRT-bit the dog  
       ‘The dog bit the postman.’

Standard analyses of the Hungarian neutral clauses assume that the Particle-Verb complex moves out of the VP, targeting a *v*-like functional head (Pred) position (É Kiss, 2008). Left-peripheral topics target designated left-peripheral positions, Spec,TopP positions (Rizzi, 1997). TopP is recursive:

- (10) [<sub>TopP</sub> A vállalkozó ellen [<sub>TopP</sub> az ügyészség<sub>j</sub> [<sub>PredP</sub> meg-kezdte<sub>i</sub> [<sub>VP</sub> *t<sub>i</sub> t<sub>j</sub>* a vizsgálatot. ]]]]  
       the entrepreneur against the prosecution PRT-started the investigation-ACC  
       ‘The prosecution started the investigations against the entrepreneur.’ (Kálmán, 2001, 22)

As already argued in Szendrői (2001), Hungarian simple clauses with topics involve the type of recursive phrasing shown in (11). The left-peripheral topic constitutes a phonological phrase that is both outside the core intonational phrase and dependent on it by virtue of being inside the outermost layer of  $\iota$ . See also our discussion of Bâsââ zero-coded passive left-dislocation in Section 3.

- (11) ( $\iota$  A postást ( $\iota$  meg-harapta a kutya)) (corresponding to (9-c))

The proposed mapping principles in (4) give rise to recursive intonational phrases, as in (11), so long as ALIGNSA-L is ranked above ALIGN $\iota$ -L. This is because in the phrasing in (11), the boundaries of the outermost intonational phrase satisfy ALIGNSA-L/R, while ALIGNHOPV-L/R ensure that the left and right edges of the core PredP (here the HOPV) are marked by the edges of an intonational phrase. These boundaries satisfy ALIGN $\iota$ -L/R, but the outermost left  $\iota$  edge violates ALIGN $\iota$ -L.

In utterances with multiple topics, there does not seem to be any evidence for the presence of intonational phrase boundaries between the topics, so *contra* Szendrői (2001), we propose that the correct prosodic phrasing of such sentences is as in (12), as follows from the proposed mapping constraints.<sup>2</sup>

<sup>1</sup> Abbreviations: ACC: accusative, AGR: agreement, AUG: augment, CONN: connective, LOC: locative, PRO: pronoun, PST: past, PRT: particle, SM: subject marker, SUBJ: subjunctive

<sup>2</sup> Certain syntactic analyses treat topics as adjoined to *v*P (or PredP) rather than sitting in specifier positions. So long as the syntax-prosody mapping principles in (4) are understood as referring to the syntactic category (Truckenbrodt, 1999, 235) that the verb overtly moves to, rather than to each segment of that category (*contra* Szendrői 2001), such a syntactic analysis would give the same result as our current proposal.

- (12) ( $\iota$  [<sub>TopP</sub> A postást<sub>k</sub> [<sub>TopP</sub> a kutya<sub>j</sub> ( $\iota$  [<sub>PredP</sub> meg-harapta<sub>i</sub> [<sub>VP</sub> t<sub>i</sub> t<sub>j</sub> t<sub>k</sub> ]]] ]))  
 the postman the dog PRT-bit  
 ‘The postman bit the dog.’

Non-neutral sentences involve a left-peripheral focus constituent, as in (13). Semantically speaking, the Hungarian left-peripheral focus gets an exhaustive interpretation (Szabolcsi, 1994). Syntactically speaking, it moves to the specifier of a designated functional position in the left-periphery, sometimes labelled FocP (Bródy, 1995). The verb itself moves to the head position of the projection, leaving its particle behind.

- (13) [<sub>TopP</sub> Péter<sub>i</sub> [<sub>FocP</sub> Marit<sub>j</sub> szerette<sub>k</sub> [<sub>PredP</sub> meg t<sub>k</sub> t<sub>i</sub> t<sub>j</sub> ]]]  
 Peter Mary-ACC loved PRT  
 ‘It was Mary that Peter started loving.’

Given the structure in (13), the mapping principles in (4) give rise to the phrasing in (14), where the leftmost element in the core  $\iota$  is now the focused phrase and the relation of the topic to the rest of the sentence is the same as in (11).

- (14) ( $\iota$  Péter ( $\iota$  Marit szerette meg))

As before, the high-ranked ALIGNSA-L/R ensure that  $\iota$  boundaries are matched with the edges of the whole utterance, which constitutes a speech act. Additionally, ALIGNHOPV-L/R align the edges of the core  $\iota$  with the projection headed by the verb. Importantly to us, Hungarian focus movement is accompanied by verb movement, resulting in FocP now being the projection that hosts the moved verb and accounting for the fact that the focused phrase is included in the core intonational phrase. Again, the core  $\iota$  boundaries satisfy ALIGN $\iota$ -L/R, while the outermost left-boundary violates ALIGN $\iota$ -L.

In comparison, on the view that every projection of a supra-inflectional functional head is mapped onto an intonational phrase, or that the “standard” clause is the complement of C, a Hungarian sentence like (13) would be expected to display an additional  $\iota$  break between the verb and the material following it. However, just like in the German example in (7), no  $\iota$  break is normally observed between the verb and the remainder of the sentence.

Let us now turn to the issue of prosodic prominence in the Hungarian clause.

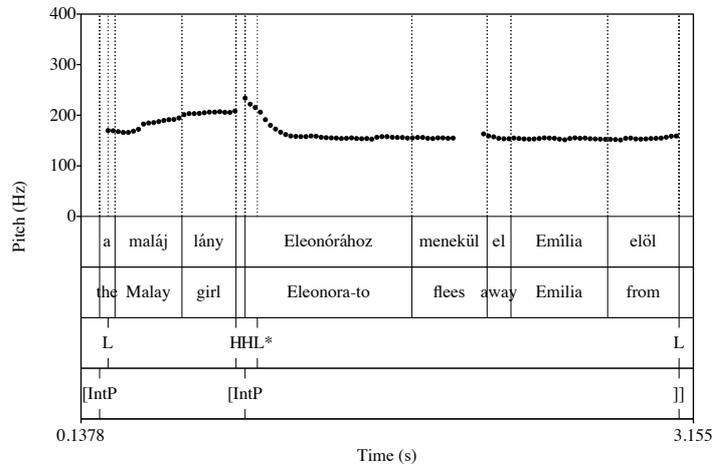
Regarding non-neutral sentences ((15), shown in Figure 1), there is a consensus in the literature that the main stress falls on the focal constituent and any postverbal phrases undergo post-focal accent reduction (possibly due to their given status). Pre-focal phrases may be optionally accented, but need not be.

- (15) ( $\iota$  [<sub>TopP</sub> A maláj lány<sub>k</sub> ( $\iota$  [<sub>FocP</sub> Eleonóra-hoz<sub>j</sub> menekül<sub>i</sub> [<sub>PredP</sub> el t<sub>i</sub> [<sub>VP</sub> t<sub>i</sub> t<sub>k</sub> t<sub>j</sub> Emília elöl.]]] ]))  
 the Malay girl Eleonora-to flees away  
 Emilia from  
 ‘The Malay girl escapes from Emilia to ELEONORA.’

We propose that this can be derived if we adopt the stress alignment constraints in (16) and assume the ranking in (17).<sup>3</sup>

<sup>3</sup> This current formulation gives the same results as Szendrői’s (2001) original proposal. There, however, the generalised alignment constraints LAS (Left Align Stress) and RAS (Right Align Stress) were invoked, which, following McCarthy and Prince (1993), were understood to incur gradient violations. In recent years, it was argued that gradient constraints should ideally not be used. See Buckley (2009) for an overview.

Fig. 1 Non-neutral declarative sentence in Hungarian



- (16) a. END-RULE-L: Main stress is on the leftmost phonological phrase of the  $\iota$  (Violated if main stress is not on the leftmost phonological phrase within  $\iota$ )  
 b. END-RULE-R: Main stress is on the rightmost phonological phrase of the  $\iota$  (Violated if main stress is not on the rightmost phonological phrase within  $\iota$ )  
 c. STRESS- $\iota$ : Every  $\iota$  has a stressed phonological phrase (Violated by headless  $\iota$ s)
- (17) STRESS- $\iota$  >> END-RULE-L >> END-RULE-R

This will ensure that main stress falls on the leftmost phonological phrase of the core  $\iota$  in Hungarian in sentences with recursive phrasing. This is because END-RULE-L will ensure that it is left-aligned with one of the left  $\iota$  boundaries, while STRESS- $\iota$  will make sure it is the innermost boundary, otherwise the innermost  $\iota$  would violate the constraint. This gives rise to main metrical prominence on the focal element in non-neutral sentences as, given our proposed phrasing, these end up as the leftmost elements of the core  $\iota$ . As argued by Szendrői (2001), by being aligned with the left edge of the core  $\iota$ , the focused phrase optimally satisfies the interface requirement in (18).

(18) *Focus Rule or Stress-Focus Correspondence Principle*

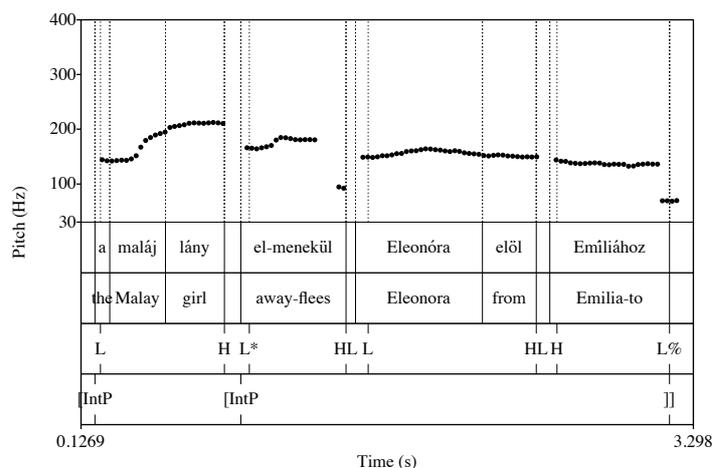
The focus of a clause is a(ny) constituent containing the main stress of the  $\iota$ , as determined by the stress-rule. (Reinhart 1995, 2006; Szendrői 2001, 2003)

As we can see from (15), the position of the verb is crucial with respect to how phrasing and consequently accentuation happens. Verb movement enlarges the  $\iota$ , allowing for the focal phrase to target a position that ends up leftmost within the core  $\iota$ , and thus receives main stress. The fact that left-peripheral topics are ‘skipped’ by the left-align stress rule showed that such elements end up phrased outside the core  $\iota$ . In Section 3, we will turn to Bäsää, for an example of a construction that provides further evidence for the proposed syntax-phonology mapping constraints, not based on accentuation, but rather established on domain-sensitive tonal processes.

In neutral sentences, all phonological phrases are stressed and carry pitch accents. This is illustrated with sentence (19) in Figure 2.

- (19) ( $\iota$  [<sub>TopP</sub> ( $\phi$  A maláj lány<sub>k</sub>) ( $\iota$  [<sub>PredP</sub> ( $\phi$  el-menekül<sub>i</sub>) [<sub>VP</sub>  $t_i$   $t_k$  ( $\phi$  Eleonóra elöl) ( $\phi$  Emília-hoz).]] ]))  
 the Malay girl away-flees Eleonora from  
 Emilia-to  
 ‘The Malay girl escapes from Eleonora to Emilia.’

Fig. 2 Neutral declarative sentence in Hungarian



Szendrői argued for an analysis that treats the phonological phrase containing the *Prt-V* complex to carry main stress (see also Ladd, 1996; Kálmán, 2001, for similar proposals). But the distribution of pitch accents illustrated in Figure 2 has led some to declare that the Hungarian declarative sentence does not have nuclear stress (Kálmán, 1985). As it will be apparent below, we still think it is plausible to assume that the *Prt-V* complex bears  $\iota$ -level prominence in Hungarian neutral declarative sentences, and this would fall out from the application of the stress rules proposed above in (16) for non-neutral sentences. But we will not defend this stronger claim here. We will only defend that (i) the *Prt-V* complex forms its own  $\phi$  bearing  $\phi$ -level accent, and that (ii) this  $\phi$  is located at the left edge of  $\iota$  (*contra* Surányi et al. (2012); Genzel et al. (2013)). (So, whether or not this  $\phi$  also bears  $\iota$ -level prominence is an issue that we leave open here.)

Our first claim that the *Prt-V* complex forms its own  $\phi$  in neutral clauses in Hungarian is consistent with existing prosodic descriptions of Hungarian (Kálmán, 1985; Varga, 2002). In Hungarian, unlike in English, the verb does not form a  $\phi$  together with the right-adjacent object noun phrase. As Szendrői (2001) proposed, Hungarian marks the left edge of syntactic constituents in prosodic structure, as is characteristic of OV languages. Note that Hungarian has dependent-head order in other syntactic domains and that Proto-Hungarian was an OV-language (É Kiss, 2013).

Note that we assume that an extra  $\phi$  right edge is inserted following the Prt-V complex, ruling out an alternative phrasing where the Prt-V is only a prosodic word sitting at the left edge of a recursive phonological phrase encompassing the Prt-V and the VP-internal PP. This could be the result of a prosodic constraint like STRONGSTART (Selkirk, 2011, 522), as the Prt-V is at the left edge of  $\iota$  (see (19)) (Selkirk, p.c.).

Let us now turn to the more contentious part of our proposal, namely that the  $\phi$  comprising the Prt-V complex sits at the left edge of  $\iota$ . In particular, this claim goes against a recent analysis of the prosodic phrasing of Hungarian declaratives by Surányi et al. (2012) (henceforth SIS) and Genzel et al. (2013) (henceforth GIS). In a production study with simple declarative sentences, they showed that sentence initial topics in Hungarian can always get a rising accent and in some cases, a falling accent is also possible (a flat pitch is also found in about 10% of the cases, but it shows no interesting systematic variation). Crucially, they find that the falling accent is restricted to certain information-structural configurations (Table 2 in GIS, p15). In particular, it does not arise unless the topic constitutes discourse-new information, or if the focus is contrastive. However, in about 40% of the cases where the topic is new and the focus is not contrastive, a falling pitch accent occurs on the left-peripheral topic and, in these cases GIS (p14, Table 1) observe that the height of the initial peak is significantly higher than the height of the peak on the verbal modifier. They conclude from the lack of pitch reset after the topic that a single  $\iota$  encompasses the whole clause, as in (20), rather than a set of nested phrases as proposed by Szendrői (2001), in (21), with the main prominence falling accent on the Prt-V complex (GIS, p23).

(20) ( $\iota$  Top Prt-V ...)

(21) ( $\iota$  Top ( $\iota$  Prt-V ...))

What is unexplained in GIS's analysis is why the Prt-V complex gets an obligatory falling accent even in broad focus cases. By analysis, it does not sit in the leftmost position of the  $\iota$  (at least not if the preceding topic is new information). One might say that the Prt-V complex receives a phrasal accent simply by virtue of not being old information, but as GIS's own investigations show, there is a crucial difference between the prosodic characteristics of the Prt-V complex and that of postverbal material: the latter is often deaccented or, if accented, the accentuation is hardly ever the falling pitch (in 24 cases out of 320, see their Table 9, p19), while a falling contour is found on the Prt-V complex in over 90% (in 298 cases out of 320, see their Table 1, p14) of the cases in all declaratives. So, it cannot simply be the case that the phonological phrase containing the Prt-V is just like any other postverbal phonological phrase inside the  $\iota$ .

We believe that the offending assumption underlying GIS's proposal is that they assume that a falling accent would necessarily indicate that the element bearing it is inside the core  $\iota$ . They assume this on the basis of previous work (SIS), where a production study was carried out with sentences involving a frame-setting topical PP and multiple peripheral quantifiers, as in (22).

(22) A vizsgán mindenki mindent megoldott egy óra alatt.  
the exam.at everyone everything.ACC prt.solved an hour under  
'At the exam, everyone solved everything in an hour.'

SIS found that the quantifiers (and also the Prt-V complex, as we will discuss below) were often pronounced with a falling contour, while the PP 'at the exam' never was. They concluded from this that the frame-setting topic, but not the quantifiers, falls outside the core  $\iota$ , whose left-edge is determined by the first falling accent by assumption. But in this study,

there was simply no opportunity for the topic to bear a falling contour, as such a contour is restricted to cases involving new information topics (and non-contrastive foci), as shown by GIS. Since the sentences like (22) were embedded in an appropriate discourse context, we may assume that the frame-setters were at least inferable, and thus the falling accent would have been unwarranted. Moreover, preverbal quantifiers have a tendency to be interpreted as contrastive foci, which would again preclude the possibility of a falling accent on the sentence-initial topic, even if it were new information.

We propose that the correct analysis of the GIS data involving new topics is that these topics, just like any other topics in Hungarian, fall outside of the core  $\iota$ . The leftmost element of the core  $\iota$  is the Prt-V complex, bearing the falling pitch accent obligatorily found in all declaratives. The topic, by virtue of being new, and thus stressed, may optionally bear phrasal accent and a falling contour. In our view, the absence of pitch reset between the phonological phrase constituted by the topic and the one containing the Prt-V complex is consistent with the phrasing in (11) and indicative of the fact that in Hungarian the relevant domain for the process of downstep is the outermost  $\iota$ .<sup>4</sup> Further support for our analysis comes from yes-no questions.

## 2.2 Hungarian yes-no questions

Ladd (1996) proposed a useful diagnostic for the  $\iota$  in Hungarian. In *yes-no* questions, which are syntactically unmarked in Hungarian, the intonational contour carries the semantic force. It starts with an optional H tone on preverbal elements in neutral clauses and prefocal elements in non-neutral clauses. The nuclear pitch, which starts with a L\* is anchored on the Prt (or if there is no particle, then on the verb itself) in neutral clauses, and on the focal element in non-neutral clauses. The right edge of the contour is marked by a H- phrasal and L% boundary tone, which are aligned with the penultimate and final syllables of the  $\iota$ , respectively (word-level stress is always on the initial syllable in Hungarian). If the utterance is long enough, then the L accent may be repeated on any postverbal phrases in neutral sentences, but no postverbal accents occur in non-neutral ones.

The prosodic characteristics of the sentences in Figure 3 and 4 are fully consistent with our proposed phrasing in (11) and (14) respectively. Our mapping principles in (4) and the stress constraints in (16) with the proposed rankings correctly derive the prosodic structure for *yes-no* questions as in (23). If we assume that the initial L\* accent falls on the first phonological phrase following the left-edge of the core  $\iota$ , then we correctly derive that it will fall on the focus in non-neutral sentences, and on the prefix (or if there is no prefix, on the verb) in neutral sentences. The H-L% tones are aligned with the penultimate and final syllables of the utterance, respectively.

- (23)  $(\iota (L)H(L) (\iota L^* \quad H-L\%))$   
 $(\iota \text{ topic } (\iota \text{ Prt-V XP XP}))$   
 $(\iota \text{ topic } (\iota \text{ FOC V Prt XP XP}))$

As we can see from (23), the position of the verb is crucial with respect to how phrasing and consequently accentuation happens. Verb movement enlarges the  $\iota$ , allowing for the focal phrase to target a position that ends up leftmost within the core  $\iota$ , and thus receive the initial L\* accent stress. The fact that left-peripheral topics are ‘skipped’ and the initial L\*

<sup>4</sup> Note that in our view, the relative height of the topic and the Prt-V should not be mistaken to reflect their metrical prominence relations.

Fig. 3 Neutral yes-no question in Hungarian

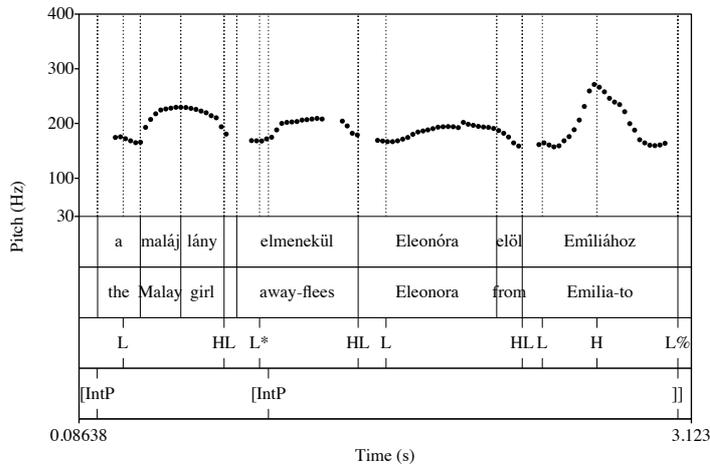
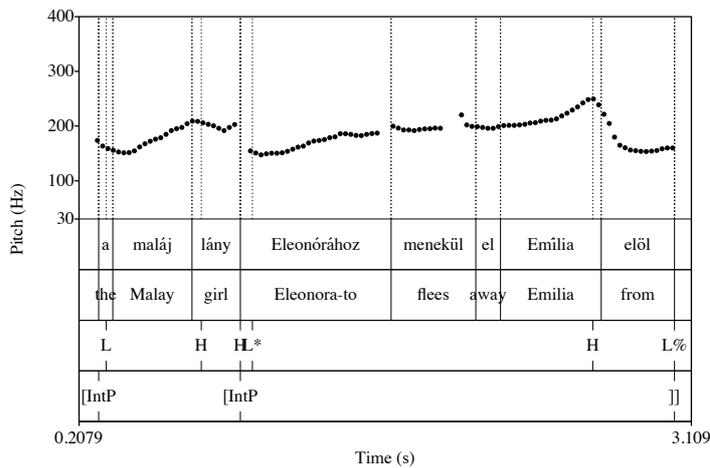


Fig. 4 Non-neutral yes-no question in Hungarian



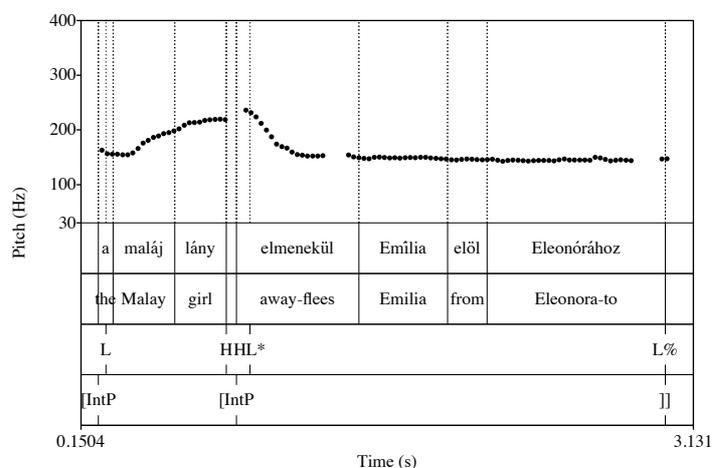
accent of the yes-no question contour target the focus shows that the left edge of the core  $\iota$  follows such topics.

Note that, contrary to our claim, one might argue that what we call *yes-no* question contour is in fact a marked contour, for instance reflecting polarity or *verum* focus (Selkirk, p.c.), as (24) and (25). This would have the consequence that the fact that such a contour cannot start on a left-peripheral topic, even if that topic is new, would have no bearing on the correct analysis of simple declaratives sentences, as declaratives would be neutral sentences with neutral prosody, while yes-no questions would be non-neutral sentences with non-neutral prosody. Fortunately, we can tell that this is not the case. Recall that the one aspect of Hungarian prosody that enjoys a consensus in the literature is the characteristic

of non-neutral prosody that main prominence falls on the left-peripheral focal element, and postverbal phrasal accents are eradicated, see Figure 5. As the minimal pair in Figures 3 and 6 illustrates, such postverbal accent reduction is not the norm in *yes-no* questions in general, but rather, it arises if there is contrast on the Prt-V complex or the veracity of the proposition. Thus, one cannot assume that *yes-no* question intonation contour is a non-neutral contour *per se*, because it does not bear the characteristic post-focal reduction of such contours.

- (24) A maláj lány elmenekül Emília elől Eleonórához.  
 the Malay girl away-flees Emilia from Eleonora-to  
 ‘The Malay girl ESCAPES from Emilia to Eleonora.’

Fig. 5 Non-neutral declarative with verb focus in Hungarian



- (25) A maláj lány elmenekül Emília elől Eleonórához?  
 the Malay girl away-flees Emilia from Eleonora-to  
 ‘Does the Malay girl ESCAPES from Emilia to Eleonora?’

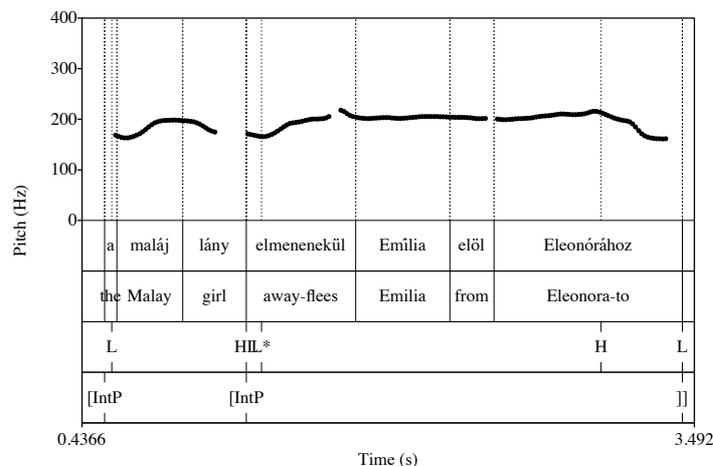
### 2.3 Quantifiers and syntax-prosody mismatch

Before closing this section, we need to tackle one remaining issue that arises with respect to our analysis of Hungarian prosody: the prosody of sentences with a focused quantifier, examined by SIS, repeated below for convenience.

- (22) A vizsgán mindenki mindent megoldott egy óra alatt.  
 the exam.at everyone everything.ACC prt.solved an hour under  
 ‘At the exam, everyone solved everything in an hour.’

Recall that SIS found that such quantifiers often bear a falling pitch contour, at least in broad focus contexts. In addition, just like in the case of the left-peripheral new topics of

Fig. 6 Non-neutral question with verb focus in Hungarian



GIS, the Prt-V complex is also marked by a falling contour (SIS, p49, Table 1). Recall that SIS assume that the leftmost falling accent marks the left edge of the core  $\iota$ : they conclude that the left-edge of the core  $\iota$  in such sentences precedes the quantifiers bearing a falling pitch. So, they assign a phrasing to such sentences as in (26).

- (26)  $(\iota (\phi \text{ A vizsgán}) (\iota (\phi \text{ mindenki}) (\phi \text{ mindent}) (\phi \text{ megoldott}) (\phi \text{ egy óra alatt})))$   
 ‘At the exam, everyone solved everything in an hour.’

In contrast, the phrasing we assign is as in (27):

- (27)  $(\iota (\phi \text{ A vizsgán}) (\phi \text{ mindenki}) (\phi \text{ mindent}) (\iota (\phi \text{ megoldott}) (\phi \text{ egy óra alatt})))$   
 ‘At the exam, everyone solved everything in an hour.’

To determine which one is the correct phrasing, we must impose a question intonation contour on such sentences. As Figure 7 shows, the  $L^*$  accent is anchored to the Prt-V complex, while the preverbal quantifiers bear marked LH contours indicating contrast, as in (28).<sup>5</sup> There is no possibility to extend the question contour to encompass the quantifiers, as in (29). This shows that the correct phrasing is the one we propose.

- (28)  $(\iota (L)H(L) LH LH (\iota L^* H-L\%))$

- (29)  $*(\iota (L)H(L) (\iota L^* H-L\%))$

Finally, let us consider the same sentence in a context that requires a contrastive narrow focus interpretation on the second quantifier. As SIS describe, in such a situation, at least some speakers alter the normal phrasing and assign a falling pitch on the second quantifier, a rising contour on the first quantifier, and on the Prt-V complex the ‘pitch contour was so compressed that it was impossible to detect the actual accent type’ (Fn 15, see also their

<sup>5</sup> We believe that the reason why the less salient H tone is unavailable for such fronted quantifiers simply lies in the syntax of such examples, but we put this issue aside here. Hungarian quantifiers need not move from their postverbal position, unless they move over a quantifier they take scope over, so the sentences under consideration here, where they appear preverbally, are information-structurally marked.

Fig. 7 Neutral question with a topic and two quantifiers in Hungarian

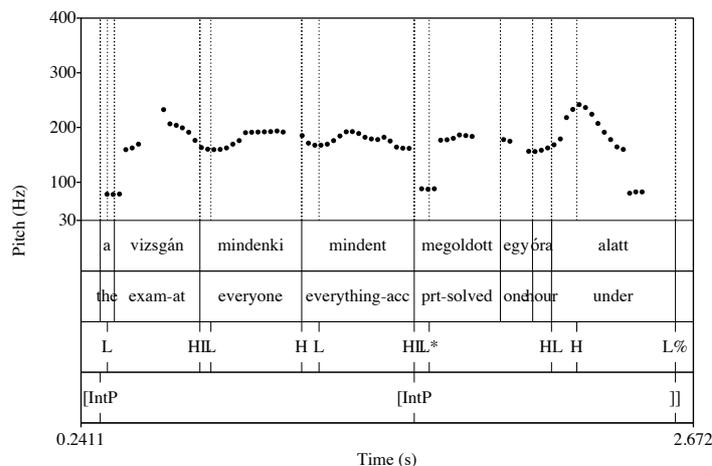


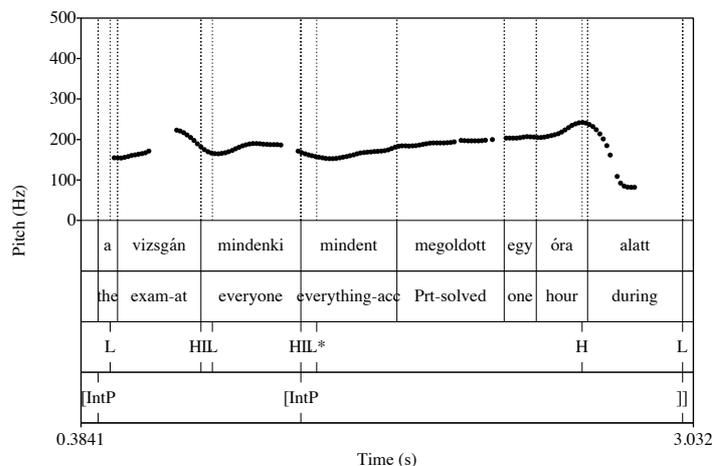
Figure 5 p54). We would interpret this state-of-affairs as indicating that the second quantifier now indeed occupies the leftmost position in the core  $\iota$ , and the Prt-V complex undergoes postfocal reduction. So the phrasing in such cases of narrow focus on the Q2 for speakers that allow such rephrasing is as in (30), which violates our syntax-prosody mapping constraints.

- (30) ( $\iota$  A vizsgán mindenki ( $\iota$  MINDENT megoldott egy óra alatt))  
 ‘At the exam, everyone solved everything in an hour.’

We agree with the idea (but not the specifics of the analysis) of SIS that such cases constitute a misaligned syntax-prosody mapping. The misaligned phrasing is motivated by the fact that on the one hand, the quantifier, being contrastively focused, must bear main prominence (see (15)), and that on the other hand, universal quantifiers are banned from the Hungarian focus position (i.e. \*A vizsgán mindenki MINDENT oldott meg egy óra alatt) (see Szabolcsi, 1994, for a semantic explanation). Indeed, as Figure 8 shows, the L\* accent of the yes-no contour can extend to the quantifier just in case it is contrastively focused.

- (31) A: ( $\iota$  A vizsgán mindenki ( $\iota$  MINDENT megoldott egy óra alatt?))  
 ‘At the exam, everyone solved everything in an hour.’  
 B: Nem, Csak KÉT feladatot!  
 no only two exercise-acc  
 ‘No, only two exercises!’

To summarize, we provided an account of the prosodic phrasing patterns of Hungarian simple declaratives and *yes-no* questions including both neutral and non-neutral utterances which assumes the mapping constraints in (4) and the stress rules in (16). Our analysis is superior to alternative analyses as it provides a unified account of all these cases. On our account, the left edge of the core  $\iota$  corresponds to the left-edge of the syntactic phrase that hosts the overt verb: the focus in non-neutral sentences, and the Prt-V complex in neutral ones. There is one exception to this, the case of focused quantifiers, which constitutes a misalignment, easily explained by independent principles.

**Fig. 8** Non-neutral question with focus on the second quantifier in Hungarian

### 3 Evidence from Bāsàá simple clauses

In this section, we examine a special type of left-dislocation in Bāsàá, which expresses a change in diathesis.<sup>6</sup> This structure is used as a zero-coded passive in languages that altogether lack passive morphology, like Lango (Nilotic) (Noonan, 1977; Noonan and Bavin Wood, 1978; Noonan, 1992) and Mbuun (Bantu B87) (Bostoen and Mundeke, 2011), or in languages in which passive voice markers genuinely reduce the valency of a verb, like in Bāsàá (see also Cobbinah and Lüpke (2012) for an overview of zero-coded passives). We first argue that the zero-coded passive left-dislocated XP is located below C and that, as shown by the tonal process of Falling Tone Simplification, it is outside of the syntactic constituent that corresponds to the core  $\iota$ . This brings further evidence to our claim that prosodic integration to the core  $\iota$  is dependent on the HOPV, rather than on a specific syntactic category. If our approach is on the right track, the general lack of prosodic integration of dislocated-topics is tied to the fact that they sit outside of the HOPV, no matter how high in the structure they are located.

#### 3.1 The syntax of zero-coded passive left-dislocation

In terms of basic word order, Bāsàá displays the typical SVO word order found in the Bantu family. Basic sentences are analyzed as in (32) (Hamlaoui and Makasso, Forth). In line with standard assumptions (e.g. Krifka, 1995; Zerbian, 2006; Polinsky and Hyman, 2009),  $vP$  hosts the internal arguments of the verb and its highest XP raises to the specifier of a functional projection in the inflectional domain (Spec,TP). In addition, the fact that adverbials

<sup>6</sup> Bāsàá is a narrow Bantu language (A43) spoken in Cameroon. According to the last official census (SIL, 1982), it is spoken by more 282 000 speakers. In the present paper, we concentrate on the dialect of Emmanuel-Moselly Makasso, spoken in the North of the area where Bāsàá is mainly spoken (Régions Centre et Littoral).

systematically follow the verb provides evidence for *v/V* to T movement (Pollock, 1989). The HOPV in the sentences considered in this section is thus TP.

- (32) [TP rì-nùní<sub>i</sub> rí-íj-óŋ]<sub>j</sub> [vP [vP t<sub>i</sub> t<sub>j</sub> [vP t<sub>j</sub> mú-<sup>4</sup>mbúl mà-láám] í pùmá ]]]  
 rì-nùní rí-íj-óŋ mù-mbúl ma-láám í pùmá  
 13-birds 13.AGR-PRES-build 6-nests 6-beautiful LOC 1.orange.tree  
 ‘Birds build beautiful nests on the orange tree.’

Although Bàsàá is in many aspects a typical Bantu language, it lacks the freedom in constituent ordering often associated with its eastern and southern relatives (Nurse and Philipson, 2003; Hamlaoui and Makasso, Forth). Instead, it belongs to the type of languages identified by Noonan (1992) as ‘indirect role marking’, i.e. in Bàsàá surface positions strongly encode thematic relations.

When it comes to changes in diathesis, only short passives can be expressed through the use of passive morphology (see (33)–(34)). These structures are agentless, hence the impossibility of attaching adverbials like ‘voluntarily’. The patient being the highest thematic role selected by the verb, it can be raised to the preverbal subject position Spec,TP.

- (33) tòlò à-n-çé-βà (\*nì òŋŋ).  
 tòlò à-n-çé-βà (\*nì òŋŋ)  
 1.mouse 1.AGR-PST1-eat-PASS with will  
 ‘The mouse was (\*voluntarily) eaten.’
- (34) tòlò à-n-çé-βà <sup>4</sup>ní síŋgà  
 tòlò à-n-çé-βà nì síŋgà  
 1.mouse 1.AGR-PST1-eat-PASS with 9.cat  
 \*‘The mouse was eaten by the cat.’  
 ‘The mouse was eaten together with the cat.’

To express passive sentences displaying both agent and patient arguments, Bàsàá resorts to object left-dislocation. This strategy, in (35), allows promoting the (more topical) patient argument, without deviating from the default linking between argument structure and syntax which requires raising the agent to Spec,TP.

- (35) tòlò síŋgà ì-n-çé jé.  
 tòlò síŋgà ì-n-çé jé  
 1.mouse 9.cat 9.AGR-PST1-eat 1.PRO  
 ‘The mouse, the cat ate it.’  
 (= the mouse was eaten by the cat)

A number of properties set zero-coded passive left-dislocation (ZP-LD) apart from both Hanging-Topic left-dislocation (HTLD) and Clitic left-dislocation (CLLD) found for instance in Romance or Germanic languages (see references *infra*). These properties generally indicate greater syntactic integration of the XP undergoing ZP-LD. We will illustrate the crucial ones here (the interested reader is referred to Noonan and Bavin Wook (1978), Woolford (1991), Bostoen and Mundeke (2011)).

First, whereas HTLD and CLLD are free, recursive operations (e.g. Rizzi, 1997; De Cat, 2007b; Frey, 2005), ZP-LD only targets one argument of the verb at a time. This is illustrated in (36) to (38), with the arguments of the ditransitive verb *to give*. Whenever both objects are full XPs, the only word order available in Bàsàá, as is typical in Bantu languages, is recipient preceding patient (Hyman, 2003). Either object can be fronted to derive a zero-coded passive ((36) and (37)), but not both (irrespective of order), (38).

- (36)      ɓ-ɗɗɨŋgɛ ɓɔ-ɓá-sò sóyól à-ɓ-tí ɓɔ ndáp.  
 ɓ-ɗɗɨŋgɛ ɓɔ-ɓá-sò      sóyól      à-ɓ-tí      ɓɔ      ndáp  
 2-children 2.PRO-2CONN-all 1.grandfather 1.AGR-PST1-give 2.PRO 9.house  
 ‘All the children, the grandfather gave them a house.’  
 (= All the children were given a house by the grandfather)
- (37)      ndáp sóyól à-ɓ-tí jɔ ɓ-ɗɗɨŋgɛ ɓɔ-ɓá-sò.  
 ndáp sóyól      à-ɓ-tí      jɔ      ɓ-ɗɗɨŋgɛ ɓɔ-ɓá-sò  
 9.house 1.grandfather 1.AGR-PST1-give 9.PRO 2-children 2.PRO-2CONN-all  
 ‘A house, the grandfather gave it to all the children.’  
 (= A house was given to all the children by the grandfather)
- (38)      \*ndáp ɓ-ɗɗɨŋgɛ ɓɔ-ɓá-sò sóyól à-ɓ-tí ɓɔ jɔ.  
 ndáp ɓ-ɗɗɨŋgɛ ɓɔ-ɓá-sò      sóyól      à-ɓ-tí      ɓɔ  
 9.house 2-children 2.PRO-2CONN-all 1.grandfather 1.AGR-PST1-give 2.PRO  
 jɔ  
 9.PRO  
 ‘A house, all the children, the grandfather gave it to them.’

Second, as in (39), singular quantified expressions and non-specific indefinites, which typically resist HTLD and CILD (De Cat, 2007b, 504), can participate in Bàsàá ZP-LD.

- (39)      hí<sup>1</sup>γí ñ-tómbá nɕɛè ì-ñ-nóɔl jɔ.  
 híγí ñ-tómbá nɕɛè ì-ñ-nóɔl      jɔ  
 every 3-sheep 9.lion 9.AGR-PST1-kill 3.PRO  
 ‘Every sheep, the lion killed it’  
 (= Every sheep was killed by the lion)

Third, ZP-LD can take place in clauses with non-root properties, like in the restrictive-relative clause in (40) (Jenks et al., 2012).

- (40)      í-màà-ɨŋgɛ (nú) ɓi-ɕɛk gwéé mɛ ɓí-<sup>1</sup>ɕɛ gwó.  
 í-m-aɨŋgɛ (nú) ɓi-ɕɛk gwéé mɛ ɓí-<sup>1</sup>ɕɛ gwó  
 aug-1-child (that) 8.food 8.poss I PST2-eat 8.PRO  
 ‘the child whose food I ate it’  
 (= the child whose food was eaten by me)

In contrast, French does not allow CILD in restrictive relative clauses, as in (41).

- (41)      \*La fille à qui le livre<sub>i</sub>, Pierre l’<sub>i</sub> a donné  
 the girl to whom the book Pierre it has given  
 ‘The girl to whom Pierre gave the book’

Finally, in contrast with Romance and Germanic HTLD and CILD, where object left-dislocation is generally inappropriate in all-new contexts, ZP-LD is possible in utterances with a wide-focus reading (see (42)).

- (42) A: ípùú<sup>+</sup>kíí 6-òòṅṅé bá-jé màséeé?  
 why 2-children 2.AGR-be.PRES happy  
 ‘Why are the children happy?’
- B: rì-nùní rí-í-óṅ mú<sup>+</sup>mbúl mà-láám í pùmá.  
 13-birds 13.AGR-PST1-build 6.nests 6-beautiful LOC orange.tree  
 ‘The birds have built beautiful nests on the orange tree.’
- B’: mùmùbúl mà-láám rì-nùní rí-í-óṅ mó í pùmá.  
 6.nests 6-beautiful 13-birds 13.AGR-PST1-build 6.PRO loc orange.tree  
 ‘Beautiful nests, the birds built them on the orange tree.’  
 (= Beautiful nests were built on the orange tree by the birds)

Altogether, these properties show that the LD-XP of ZP-LD is syntactically comparable with the subject of a morphological passive, rather than with a dislocated peripheral topic. Syntactic proposals differ with respect to the exact location of the latter type of left-dislocated phrases (LD-XP). The LD-XP has alternatively been treated as being adjoined to a “discourse projection” (TP, De Cat, 2007a) or to the “clause” (CP, Cheng and Downing, 2009), as the specifier of a functional projection in the supra-inflectional domain (TopP, Cinque, 1983; Rizzi, 1997) or, most recently, as belonging to an altogether separate clause (Ott, 2013). The last approach explicitly captures the long acknowledged syntactically non-integrated nature of these peripheral topics. This lack of syntactic integration has in turn been associated with their observed lack of prosodic integration (Selkirk, 2005; Cheng and Downing, 2009, among others), as these left-dislocated phrases do not phrase together with the core clause (Downing, 1970; Frascarelli, 2000; De Cat, 2007a; Downing, 2011, among other works).

In contrast, Woolford (1991) proposes the syntactic analysis in (43) for Lango’s ZP-LD, with the LD-XP (“a second subject”) occupying the Spec,IP, and the agent (the actual grammatical subject) staying in Spec,VP. But assuming that in such structures, the OSV order is derived by object-movement to Spec,IP across the in-situ subject is problematic on Relativized Minimality (Rizzi, 1990): what would make the object move over the subject in a language that otherwise moves the argument with the highest thematic role to Spec,IP?

- (43) [<sub>IP</sub> NP<sub>i</sub> [<sub>VP</sub> NP V *t<sub>i</sub>/pro<sub>i</sub>* ]]

Our alternative representation in (44) captures Woolford’s insight while respecting the fact that, in Bàsàá, subject agreement takes place above vP (in T). There is no Relativized Minimality violation, as the subject moves to Spec,TP and a [+ topic] feature attracts the object to Spec,TopP.

- (44) [<sub>CP</sub> ... [<sub>TopP</sub> DP<sub>i</sub> [<sub>TP</sub> DP<sub>j</sub> V<sub>k</sub> [<sub>vP</sub> *t<sub>j</sub>* V<sub>k</sub> [<sub>VP</sub> V<sub>k</sub> pro<sub>i</sub> ]]]]]]

Syntactically, the LD-XP in (44) belongs to the core-clause. Crucially, it is located within the inflectional domain. Additional evidence for the location of the ZP-LD-XP within the inflectional domain comes from Bantu languages like Kinyarwanda (Kimenyi, 1980), as in (45), or Kanyok (Bostoen and Mundeke, 2011), in (46), in which the fronted object of OVS zero-coded passives controls subject agreement on the verb.

- (45) igi-tabo ki-som-a umu-huúngu  
 7-book 7.SM-read-ASP 1-boy  
 ‘The book is being read by the boy.’ (Kimenyi, 1980, 192)

- (46) mi-saany yì-dyààdy ba-tùw  
 4-fish 4.SM-eat 2-fisherwoman  
 ‘The fish is eaten by the fisherwomen.’ (Bostoen and Mundeke, 2011, p165, from  
 p.c. with Timothee Mukash-Kalel)

The relation between the OSV and OVS zero-coded passives was already noted by Bostoen and Mundeke (2011), who investigate ZP-LD in Mbuun, and is discussed further in Hamlaoui and Makasso (2013). The most studied case of OVS zero-coded passive is probably from Kinyarwanda (Kimenyi, 1980, 1988; Morimoto, 1999, 2006). As these authors show, in so-called “subject-object reversal” structures as in (45), preverbal object and postverbal subject retain their respective object and subject properties: “NPs advanced to subject by the [Subject-Object] reversal rule do not acquire the properties of basic subjects, such as raising, deletion under identity, and ha-insertion” (Kimenyi (1980, 145) from Morimoto (2006, 166)). The only subject-like properties of the object are its linearly preverbal location and its control over subject-agreement. So, in contrast with (non-passive-related) OVS structures, observed for instance in V2 languages like German, in which O and V sit in the CP domain and do not agree, what is observed in Kinyarwanda suggests that O and V sit within the inflectional domain.<sup>7</sup> What distinguishes Kinyarwanda from Bàsàá is then how high the verb can move within its extended projections, with the Kinyarwanda verb moving over the subject to Top, as in (47).<sup>8</sup>

- (47) [CP ... [TopP DP<sub>i</sub> V<sub>k</sub> [TP DP<sub>j</sub> <V><sub>k</sub> [vP t<sub>j</sub> <V><sub>k</sub> [VP <V><sub>k</sub>]]]]]

In sum, ZP-LD provides precious evidence as to the syntactic edges with which  $\iota$  boundaries align within root clauses. They can help empirically test whether  $\iota$  boundaries universally align with a specific syntactic category like CP/Topic/CommaP or whether the notion of ‘clause’ that serves as a basis for  $\iota$  formation should be characterized in purely structural (and thus cross-categorial) terms (just like prosodic words and phonological phrases). In Bàsàá, the mapping constraints given in (4) predict the presence of an  $\iota$  boundary between the left-dislocated object and the subject, as this position corresponds to the left edge of the HOPV. We will show that this prediction is borne out.

### 3.2 The prosody of left-dislocation in Bàsàá

From a prosodic perspective, Bàsàá is a tonal language which underlyingly contrasts two level tones H(igh) and L(ow). Additionally, a number of grammatical morphemes (noun class prefixes, some tense markers and verbal extensions) are underlyingly toneless (Hamlaoui et al., 2014). In the existing literature on Bàsàá, two tone rules have been particularly discussed (Bitjaa Kody, 1993; Dimmendaal, 1988; Hyman, 2003; Makasso, 2008). The first one, High Tone Spreading (HTS) turns H-L and H- $\emptyset$  sequences into H-HL and H-H sequences, respectively. The domain of application of HTS is the phonological phrase.<sup>9</sup> When the proper tonal

<sup>7</sup> Asymmetric c-command is a strong requirement for subject-agreement in Bantu languages, compared to Indo-European languages, in which subject agreement normally takes place with the argument carrying the subject case/thematic role, no matter its syntactic location (Baker, 2008).

<sup>8</sup> This structure predicts that the object in Kinyarwanda OVS is prosodically integrated into the core  $\iota$ , due to accompanying verb movement to Top. To the best of our knowledge, no data is yet available that allows testing this prediction.

<sup>9</sup> For more details on the connection between tone rules and prosodic structure in Bàsàá, see Hamlaoui et al. (2014).



FTS also applies between a verb and the phrase that immediately follows it within the same clause, as in (54), and between the arguments or adjuncts of a verb, as in (55) and (56).

- (54) ( $\iota$  mùr à- $\grave{h}$ -lò  $^{\uparrow}$ hálà).  
 mùr à-n-lò hálà  
 1.man 1.AGR-PST1-arrive like.this  
 ‘The man arrived in this fashion.’
- (55) ( $\iota$  sóyól à- $\grave{h}$ -tí ß- $\text{ɔ}$ ngé ßó- $\acute{b}$ á-só  $^{\uparrow}$ ndáp).  
 sóyól à-n-tí ß- $\text{ɔ}$ ngé ßó- $\acute{b}$ á-sò ndáp  
 1.grandfather 1.AGR-PST1-buy 2-children 2.PRO-2.CONN-all 9.house  
 ‘The grandfather bought all the children a house.’
- (56) ( $\iota$  Lìngòm à- $\grave{h}$ - $\text{ɕ}$ é má-kàlà mó-má-só  $^{\uparrow}$ kékèlà).  
 Lìngòm à-n- $\text{ɕ}$ é ma-kàlà mó-má-sò kékèlà  
 Lìngom 1.AGR-PST1-eat 6-doughnuts 6.PRO-6.CONN-all morning  
 ‘Lìngom ate all the doughnuts in the morning.’ (adapted from Bitjaa Kody)

Importantly, whenever the LD-XP of ZP-LD and the subject create the proper tonal configuration, as in (57), FTS fails to apply.

- (57) ßò $\grave{d}$ ngé ßó- $\acute{b}$ á-sò sóyól à- $\grave{h}$ -téhé ßó.  
 ßò $\grave{d}$ ngé ßó- $\acute{b}$ á-sò sóyól à-n-téhé ßó  
 2-children 2.PRO-2.CONN-all 1.grandfather 1.AGR-PST1-see 2.PRO  
 ‘All the children, the grandfather saw them.’  
 (= All the children were seen by the grandfather)

As predicted by the constraints in (4), the HOPV, which in Bàsàá is TP, forms a core  $\iota$  excluding the LD-XP in Spec,TopP. So, the prosodic structure of the sentence in (57) is (58).

- (58) ( $\iota$  ßò $\grave{d}$ ngé ßó- $\acute{b}$ á-sò ( $\iota$  sóyól à- $\grave{h}$ -téhé ßó)).

As for alternative approaches, both approaches that tie the notion of clause to CP (Truckenbrodt, 2007; Henderson, 2012; Cheng and Downing, 2007, 2009; Downing, 2011) and approaches in which the crucial syntactic boundary for mapping  $\iota$ s is the edge of the maximal projection corresponding to the complement of C (Selkirk, 2011; Dobashi, 2003; Ishihara, 2007) predict the phrasing in (59). Approaches that associate the TP with clausehood would derive the Bàsàá phrasing correctly, but would fail to encompass the German V2 sentences (Section 1) and the Hungarian left-peripheral focus sentences (Section 2).

- (59) \*( $\iota$  ßò $\grave{d}$ ngé ßó- $\acute{b}$ á-só  $^{\uparrow}$ sóyól à- $\grave{h}$ -téhé ßó)

So, only our theory based on the HOPV can capture the intonational phrasing of V2 structures in German (Section 1), focus-fronting structures in Hungarian (Section 2) and make the right prediction concerning the intonational phrasing of low topicalization in Bàsàá.

Before concluding, we would like to briefly address the variation in the prosodic status of LD-XPs.

## 3.3 Variation in the phrasing of LD-XP

The prosodic phrasing of ZP-LD in Bāsàá is comparable with the phrasing of left-dislocation reported by Zerbian (2007a) for Northern Sotho (henceforth NS), in which there is evidence that an LD-XP does not constitute a separate  $\iota$ . In NS, penultimate lengthening and a rule of finality restriction characterize the right-edge of  $\iota$ s. These phonological processes apply at the end of declarative sentences, as well as at the end of right dislocated phrases.<sup>12</sup>

As shown by Zerbian, the penultimate syllable of the LD-XP in (60) fails to display the lengthening typical of words located at the right edge of an  $\iota$ , and its final syllable is not extratonal, that is, exempt of receiving an H through the process of HTS.<sup>13</sup> Thus, LD-XP

- (60) mo-sádí ke a mmó:na  $\iota$   
 1-woman 1st A 1.OM.see  
 ‘The woman, I see her.’

In Bāsàá, contour tones are not generally restricted to  $\iota$ -edges. For instance, as they are not followed by an H, the falling tones in (61) and (62) do not simplify, showing that these contour tones are licit in  $\iota$  medial position.

- (61) ( $\iota$  kínjê à-ñ-sóŋgòl).  
 kínjê à-n-sóŋgòl  
 1.chief 1.AGR-PST 1-count  
 ‘The chief counted.’
- (62) ( $\iota$  n-čé m-úr à-ñ-sóŋgòl)?  
 n-čé m-úr à-n-sóŋgòl  
 who 1-man 1.AGR-PST 1-count  
 ‘Which man counted?’

The presence of a contour tone on the left-dislocated object in (57) is thus not indicative of this constituent forming its own  $\iota$ , as in the prosodic structure in (63).

- (63) \*( $\iota$  ñdòŋgé ñó-ñá-sò) ( $\iota$  sóyól à-ñ-téhé ñó)  
 ‘All the children, the grandfather saw them.’  
 (= All the children were seen by the grandfather)

<sup>12</sup> Zerbian analyses the right-dislocated phrase as a separate  $\iota$ . The prosody she reports is however consistent with our account, in which the outermost  $\iota$  boundary is inserted by ALIGN-SA, R rather by the dislocated phrase itself.

<sup>13</sup> Zerbian reports the results of a small perception study whose results suggest that dislocated phrases are prosodically indistinguishable from preverbal lexical subjects. Either there is no left edge of an  $\iota$  between a fronted object and the remainder of the clause in Sotho, as in (i), which would go against our prediction, or it could be that in this language, the full lexical subject, just like a fronted-object, is outside of the core  $\iota$  (and thus prosodically indistinguishable from it, as in (ii) and (iii)). Zerbian (2006, 54) indeed argues that NS belongs to the Bantu languages in which full syntactic subjects are always dislocated.

- (i) ( $\iota$  object subject pronoun verb ..)  
 (ii) ( $\iota$  subject ( $\iota$  pronoun verb ...))  
 (iii) ( $\iota$  object ( $\iota$  pronoun verb ...))

If our syntax-prosody mapping approach is on the right track, Zerbian’s results constitute additional evidence for syntactic analyses that treat Sotho full lexical subjects as being located above TP rather than in Spec,TP.

The phrasing of left-dislocation observed in Sotho and Bàsàá is consistent with our syntax-prosody mapping constraints, in which the  $\iota$  break that separates a LD-XP from the remainder of the clause is not introduced by the LD-XP itself, but rather by the HOPV. This phrasing however contrasts with a different one reported for a number of languages. For instance, Selkirk (2011) observes that in Xitsonga, LD-XPs right-align with an  $\iota$  break. Penultimate lengthening is also an indicator of the presence of an  $\iota$  right edge in Xitsonga (Kisseberth, 1994; Selkirk, 2011). It is found at the edge of simple declarative sentences and at the right edge of right-dislocated phrases. Interestingly, in Xitsonga, penultimate lengthening is also found at the edge of LD-XPs. In that language, the phrasing of left-dislocation is of the type in (63), in which the LD-XP constitutes an  $\iota$  of its own, see (64).

- (64) ( $\iota$  ti-ho:mú) ( $\iota$  hi-hontlovila x-<sup>4</sup>á-xá:v-a)  
 10-cow 7-giant 7.SM-tense-buy-FV  
 ‘As for the cattle, the giant is buying.’ (Kisseberth, 1994, 154)

In Xitsonga, LD-XPs thus seem to have greater prosodic prominence and autonomy than in NS or Bàsàá. As proposed by Selkirk (2011, 494), if Xitsonga LD-XPs syntactically belong to the same clause as the material that follows them (instead of belonging to a separate clause, as in Ott (2013)), the high ranking of a prosodic constraint such as STRONGSTART (Selkirk, 2011, 522) could promote the dislocated phrase into a separate  $\iota$ . EQUALSISTERS, proposed by Myrberg (2013, 75), would yield a similar result.

As noted before by Zerbian (2007b), Downing (2011) and Selkirk (2011) (among other works), forming a separate  $\iota$  is not a necessary trait of topics. Thus we have an argument against Frascarelli’s (2000) and Feldhausen’s (2010) proposals that establish a direct link between topicality and alignment with  $\iota$  in the following way:

- (65) ALIGNTOPIC (Feldhausen, 2010)  
 Align the right edge of a [dislocated] topic constituent to the right-edge of a prosodic phrase [ $\iota$ ].

The problem with a constraint like (65) is that it only captures the phrasing of LD in languages that pattern like Xitsonga (and a number of Romance languages), but says nothing about languages like NS, Bàsàá or Hungarian, in which topics do not form a separate  $\iota$  but are none-the-less set off from the remainder of the clause.<sup>14</sup>

We started this section with a series of syntactic arguments showing that ZP-LD should not be analysed on a par with CILD and HTLD in Romance and Germanic languages. We would like to conclude the section by pointing out that in spite of their distinct underlying syntactic structures, HTLD, CILD, Bàsàá ZP-LD and even Hungarian topics display a similar prosodic behaviour in that the dislocated element is set off from the rest of the clause by an  $\iota$  break. Among the various approaches to the syntax-phonology mapping of intonational phrases, only the flexible approach captures the prosodic similarity of this variety of syntactic structures.<sup>15</sup> What all these cases share is that the LD element is syntactically outside of the projection hosting the overt verb. In our approach, this is why they end up prosodically outside the core  $\iota$ .

<sup>14</sup> We do not have space to discuss this issue further, but see Szendrői and Hamlaoui (in prep), where we propose a general interface requirement that topic align with the edge of an  $\iota$  (with no reference to right edges).

<sup>15</sup> An alternative line of thought due to Selkirk (2005) establishes an indirect link between topicality and phrasing by proposing that topics constitute an independent speech act. To accommodate languages like NS, Hungarian or Bàsàá, this proposal would have to be supplemented with some clear diagnostic as to which type of topics constitute their own speech acts and which ones do not. We will not pursue this possibility here.

#### 4 Conclusion

In this paper, we argued that the syntax-prosody and prosody-syntax mapping constraints that relate syntactic clauses to *ι*s do not rigidly refer to specific syntactic categories, say CP or TP, but rather, that they are flexible in nature. In particular, we proposed that what constitutes a clause is the highest projection to which the root verbal material (i.e. the verb itself, the inflection, an auxiliary, a question particle) is overtly moved or inserted, together with the material in its specifier. The size of the *ι* can thus vary from language to language and construction to construction, depending on the position of the verb (or verb related material) in the syntactic tree. This explicitly cross-categorial approach allowed for an analysis of Hungarian left-peripheral topics and foci, as well as Bàsàá zero-coded passive left-dislocated objects in simplex clauses. An additional benefit is that our account encompasses non-canonical word orders involving topics and foci without making reference to the discourse status of the elements.

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