Prosodic domains do not match spell-out domains*

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SUMMARY

In this paper we compare two current theories about the syntax-phonology interface. One theory proposes that spell-out domains directly define phonological phrases. In the alternative, edge-based mapping theory, prosodic domains are defined based on an algorithm asymmetrically mapping syntactic constituent edges (for example, phase edges) to prosodic constituent edges. To compare these two theories, we focus on the prosodic phrasing in the spell-out domains of vP phase and CP phase. Using data from selected Bantu languages illustrating common prosodic phrasing patterns in simple and complex sentences, we show that an edge-based analysis of the phrasing straightforwardly accounts for all the data. A spell-out domain approach predicts incorrect phrasing patterns.

RÉSUMÉ

Cet article compare 2 théories actuelles de l'interface syntaxe – phonologique. L'une d'elles propose que les domaines d'épellation ('spell-out') définissent directement les syntagmes phonologiques, alors que l'autre, la théorie de la correspondance des extrémités ('edge-based mapping theory'), défini les domaines prosodiques à partir d'un algorithme qui associe asymétriquement l'extrémité d'un constituant syntaxique (par exemple, l'extrémité d'une phase) avec celle d'un constituant prosodique. Afin de comparer ces deux théories, nous examinons la structure en constituants prosodiques dans les domaines d'épellation que constituent les phases vP et CP. A partir de données de langues bantoues illustrant des patrons communs de structuration prosodique dans des phrases simples et complexes, nous démontrons que la théorie de la correspondance des extrémités prédit automatiquement toutes les données, alors que l'approche en termes de domaines d'épellation ne prédit pas correctement les patrons de structuration prosodique attestés.

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1 INTRODUCTION

The correlation between phonology and syntax has been investigated in the generative linguistic tradition beginning with *SPE*. Two main approaches have been taken to encoding the correlation in the grammar. Indirect reference theories (Nespor & Vogel 1986; Selkirk 1986; Truckenbrodt 1995) propose that phonology is not directly conditioned by syntactic information. Rather, the interface is mediated by phrasal prosodic constituents, like Phonological Phrase and Intonation Phrase, which need not match any syntactic constituent. Direct reference theories (Kaisse 1985; Odden 1995; Seidl 2001), in contrast, argue that phrasal prosodic constituents are superfluous, as phonology can – indeed, must – refer directly to syntactic structure.

Phase-based syntax (Chomsky 2001) has provided new ways of formalizing the relation between syntactic and prosodic domains, and has led to new versions of these approaches. In one current theory – a more or less direct reference approach – spell-out strips away a phonological string (the complement of a phase head) from the syntactic structure and maps it to the phonological component (for a variety of proposals see, e.g., Dobashi 2004, 2009, 2010; Ishihara 2007; Kahnemuyipour 2009; Newell 2008; Kratzer & Selkirk 2007; Pak 2008; Selkirk 2009, 2011). In an alternative edge-based indirect reference approach, prosodic phrasing algorithms asymmetrically map syntactic constituent edges (for example, phase edges) to prosodic constituent edges. (For a variety of proposals, see An 2009; Cheng & Downing 2007, 2009; Kandybowicz 2009; Selkirk 1986, 1995; Truckenbrodt 1995, 2007.)

In this paper, we compare the phrasing predicted by the two approaches for simple sentences, and restrictive relative clauses. We present data from selected Bantu languages illustrating the relevant prosodic phrasing patterns and show that an edge-based analysis of the phrasing straightforwardly accounts for all the data, whereas a spell out domain analysis incorrectly predicts that subjects, verbs, and heads of restrictive relative clauses should all phrase separately from what follows. We conclude that an edge-based approach provides the best account of the phrasing.

2 PREDICTED PHRASINGS OF TWO APPROACHES TO THE PHONOLOGY-SYNTAX INTERFACE

2.1 SOME BASICS OF SYNTACTIC STRUCTURE FOR BANTU LANGUAGES

Before sketching the two approaches to the prosodic phrasing, we briefly define a phase and its spell-out domain (see work like Ishihara 2007; Kahnemuyipour 2009; Pak 2008; Selkirk 2009 for detailed phonologist-friendly definitions of the phase). According to the syntactic theory of phases (Chomsky 2001, 2004), syntactic structure is sent out in chunks – phase by phase – for phonological (and semantic) interpretation. More precisely, *Transfer* sends out a spell-out domain, which is expected to be "interpreted" in the phonological component (see, e.g., Dobashi 2010). The spell-out domain is the complement of the head of the phase:

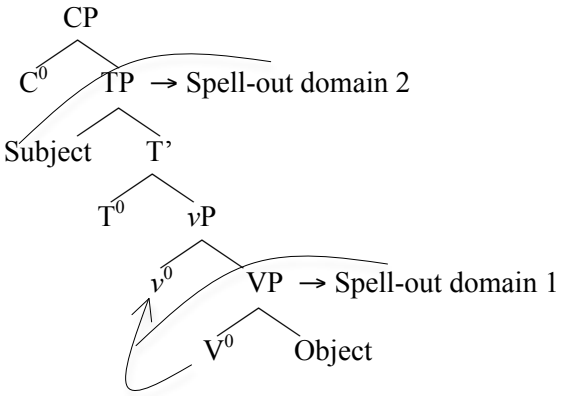
(1) Phases: *v*P and CP Equivalent spell-out domains: VP and TP/IP, respectively

For Bantu languages some background is necessary to understand what is in VP and TP/IP. Basic word order in most Bantu languages is: (S) V (IO) (DO) (Bearth 2003; Heine 1976). This order is rather rigidly enforced in languages like Zulu, less rigidly in languages like Chichewa. Subjects must raise to SpecTP to trigger subject agreement with the verb (see

Carstens 2005). The subject (agreement) marker is both an agreement marker and a pronominal (see Bresnan and Mchombo 1987). Following Julien (2002) and Buell (2005, 2006), we assume that the verb in Bantu languages undergoes movement to a position between T^0 and v^0 (an X^0 (inflectional final vowel, containing valency and modality information)). For a simple sentence (S V IO DO) like the one in (2), the syntactic structure is as shown below in (3). In a cyclic spell-out model, note that both the verb and the subject are outside of the first spell-out domain:

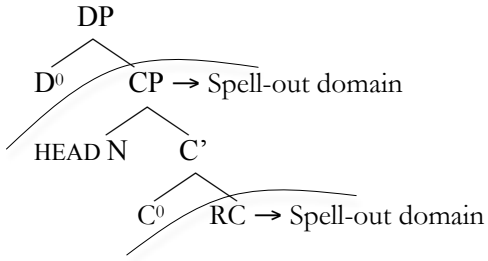
(2) Zulu (Cheng & Downing 2009)
[$_{TP}$ Ú-Síph' ú-phékél' [$_{vP}$ ú-Thánd' in-kû:khu]]
CL1-Sipho 1SUBJ-cooked.for CL1-Thandi CL9-chicken
'Sipho cooked chicken for Thandi.'

(3)



Restrictive relative clauses are contained in a CP phase, as shown in (4):

(4) Restrictive relative clause



In a standard Kaynian analysis (Kayne 1994: 91; Bianchi 1999: 190-197), a restrictive relative clause is in the spell-out domain within this CP, while the head and complementiser are outside this spell-out domain. This is illustrated below with an example from English, where the spell-out domain (IP) is bolded:

(5) We invited [$_{DP}$ the [$_{CP}$ students [$_{C'}$ that [$_{IP}$ **Tracy taught to ski**]]] to visit the Alps.

Given these assumptions about the relevant syntactic structures, we next introduce the two approaches and see what phrasings they predict for simple sentences and relative clauses.

2.2 SPELL-OUT DOMAIN IS PROSODIC DOMAIN

The relation between syntactic domains and prosodic domains is a direct one in phase-based approaches to the phonology-syntax interface which assume that the spell-out domain is a prosodic domain. Each spell-out domain is by definition a domain for the application of phonological processes (i.e., phonological interpretation). While work like Pak (2008) argues that there is no need for prosodic constituents like Intonation Phrase or Phonological Phrase, works like Selkirk (2009, 2011), Dobashi (2009, 2010) and Ishihara (2007) propose to maintain prosodic constituents, which by default match syntactic spell-out domains. The constraint in (6) formalizes the default prosodic parse for the CP spell-out domain:

(6) Match clause (Selkirk 2009, fig 10)
$[_{CP}$ Spec $[_{C'}$ C^0 **$[_{TP/IP}$ …….]]]** CP spell-out domain
⇩
(……..) Intonation Phrase

2.3 EDGE-BASED PROSODIC ALIGNMENT

The relation between syntactic domains and prosodic domains is indirect in the edge-based theory of prosodic phrasing (An 2009; Cheng & Downing 2007, 2009; Kandybowicz 2009; Selkirk 1986, 1995; Truckenbrodt 1995, 1999, 2005, 2007). This approach requires one edge of a major syntactic constituent to coincide with an edge of a prosodic constituent, Phonological Phrase or Intonation Phrase. Phonological Phrases coincide with lexical XPs, while Intonation Phrases coincide with functional XPs, like phases. Because only one edge of the prosodic phrase and the syntactic phase must coincide, a spell-out domain can be parsed with material outside the domain. For example, given a parsing algorithm which aligns right edges of phases and prosodic phrases, formalized with the alignment constraints in (7) and (8) (Cheng & Downing 2009), the spell-out domain is optimally parsed with preceding material, rather than forming an independent prosodic domain:

(7) ALIGNR[PHASE, INTPH]: Align the right edge of every phase (vP/CP) with the right edge of an Intonation Phrase (IntPh).
(8) ALIGNR[INTPH, PHASE]: Align the right edge of every Intonation Phrase (IntPh) with the right edge of a phase (vP/CP).

This is represented in (9), where parentheses indicate the phrasing optimized by the alignment constraints:

(9) ($[_{CP}$ Spec $[_{C'}$ C^0 **$[_{TP/IP}$ …….]]]**) cf. (6)

2.4 PREDICTED PHRASING, SIMPLE SENTENCES AND RESTRICTIVE RCS

The two approaches straightforwardly lend themselves to empirical testing, as they predict different phrasings for both simple sentences and complex sentences like restrictive relatives. The Prosodic phrase = spell-out domain predicts the phonological phrasing shown in (10), below. As we can see in (a), VP is the first spell-out domain in a simple clause, thus IO and DO are expected to phrase separately from the verb (**spell-out domain 1 is bolded**). TP is the next spell-out domain, thus Subject and Verb are expected to phrase together (**spell-out**

domain 2 is bolded and underlined). As shown in (b), for a *restrictive relative clause* the relative TP is the first relevant spell out domain **(bolded**), thus the head and the relative complementiser are expected to phrase separately from the RC:

(10) Relevant structures (assuming the verb has raised above vP) and spell-out domains
a. *simple sentence*
[$_{CP}$ [$_{TP}$ **subject verb** [$_{vP}$ [$_{VP}$ **IO DO**]]
b. *restrictive relative clause (RC)*
We invited [$_{DP}$ the [$_{CP}$ students [$_{C'}$ that [$_{TP}$ **Tracy taught to ski**]]] to visit the Alps.

The edge-based approach (assuming the right edge alignment constraints in (7) and (8)) predicts a different phonological phrasing for the same constructions (parentheses indicate predicted phrasing in (11)). As we can see in (a), in a simple sentence the first right phrase edge is at the first right vP or CP edge, thus IO and DO are expected to phrase with the verb. The subject and vP are also expected to phrase together. As shown in (b), for a *restrictive relative clause* the head and the relative complementiser are expected to phrase together with the relative clause, as no right phase edge intervenes:

(11) Relevant structures (assuming the verb has raised above vP) and Edge-based phrasings
a. *simple sentence*
([$_{CP}$ [$_{TP}$ subject verb [$_{vP}$ [$_{VP}$ IO DO]] **)**
b. *restrictive relative clause (RC)*
(We invited [$_{DP}$ the [$_{CP}$ students [$_{C'}$ that [$_{TP}$ Tracy taught to ski]]] **)** (to visit the Alps)

In the next section, we test the two approaches on the prosodic phrasing found in four Bantu languages which have received attention in the recent phonology-syntax literature.

3 TESTING THE TWO APPROACHES: SIMPLE SENTENCES

In this section we look at four Bantu languages where previous work shows there are systematic cues to prosodic phrasing: Chichewa, Kinyambo, Luganda and Zulu. As we shall see in section 3.1, the attested phrasing in these languages most closely matches that shown in (11). Complements of the V phonologically phrase with the verb (in broad focus contexts) in all four languages. (Indeed, as work like Dobashi (2004) and Selkirk (1986) note, it is common, cross-linguistically, for a verb to phrase with at least its first following complement.) The subject variably phrases with the verb phrase in Zulu, Chichewa and Kinyambo. It always phrases separately from the verb phrase in Luganda.

3.1 THE DATA

These points are illustrated first with data from Zulu and Chichewa. The salient cue to prosodic phrasing in Zulu and Chichewa is penultimate vowel lengthening. The sentences in (12b, c) and (13b, c) illustrate the variation in the phrasing of the subject, which we will argue is conditioned by the topic status of the subject.

(12) Zulu (Cheng & Downing 2007, 2009)
a. (Bá-níké ú-Síphó íí-maali)
2SUBJ-give CL1-Sipho CL9-money
'They gave Sipho money.'
b. (Ú-Síph' ú-phékél' ú-Thánd' in-kúukhu)
CL1-Sipho 1SUBJ-cooked.for CL1-Thandi CL9-chicken
'Sipho cooked chicken for Thandi.'
c. (Ín-kósíkaazi) (í-théngel' ábá-fán' ízím-baatho)
CL9-woman 9SUBJ-buy.for CL2-boy CL10-clothes
'The woman is buying clothes for the boys.'

(13) Chichewa (Downing & Mtenje, in press; Kanerva 1990: 98, fig. (101a)))
a. (A-na-ménya nyumbá ndí mw-áála)
s/he-TAM-hit CL9.house with CL3-rock
'S/he hit a house with a rock.'
b. (Ma-kóló a-na-pátsíra mwaná ndalámá zá
CL6-parent 6SUBJ-TAM-give CL1.child CL10.money 10.of
mú-longo wáake)
CL1-sister 1.her
'The parents gave the child money for her sister.'
c. (M-fúumu) (i-na-pátsá mwaná zóóváala)
CL9-chief 9SUBJ-TAM-give CL1.child CL10.clothes
'The chief gave the child clothes.'

The data in (15) illustrate prosodic phrasing in Kinyambo. In this language the cue to prosodic phrasing is High Tone Deletion:

(14) KINYAMBO HIGH TONE DELETION (HTD) (Bickmore 1990: 9)
H tone is deleted if followed by a H tone in the following word in the phrase.

The sentence in (15a) illustrates that the verb plus following (non-modified) complements phrase together. Notice that only the final word in the phrase maintains its input High tones. (A phrasal High tone is inserted on the initial vowel of nouns not initial in the phrase.) The sentences in (15b, c) illustrate the variation in the phrasing of the subject, which depends on whether a (subject) DP is modified (branching in Bickmore's analysis), while (15d) illustrates that the branching effect also conditions the phrasing of verbal complements:

(15) Kinyambo (Bickmore 1990)
a. /Nejákúha omutáhi ebitóoke / → (Nejákuh' ómutah' ébitóoke)
s/he will give CL1.friend CL8.bananas
'He will give the friend bananas.'
b. /aba-kózi bá-ka-júna / → (abakozi bákajúna)
CL2-workers 2SUBJ-TAM-help
'The workers helped.'
c. /aba-kózi bakúru bá-ka-júna / → (abakozi bakúru) (bákajúna)
CL2-workers 2.mature 2SUBJ-TAM-help
'The mature workers helped.'
d. /Nejákwórecha omukáma w'ábakózi émbwa /
s/he will show CL1.chief 1.of.CL2.worker CL9.dog
→ (Nejákworech' ómukama w'ábakózi) (émbwa)
'S/he will show the chief of the workers the dog.'

The data in (17) illustrate prosodic phrasing in Luganda, where the cue to prosodic phrasing is High Tone Anticipation:

(16) HIGH TONE ANTICIPATION (HTA):[1]
A H tone spreads leftward through toneless moras onto preceding words within the domain. It must cross a prosodic word boundary, and it must stop short of the first mora in the domain. (Hyman & Katamba 1993: 45; 2010; Pak 2008: 134).

The sentences in (17a, b) illustrate that the verb plus following complements, as well as right dislocated elements phrase together. The sentences in (17c, d) illustrate that the subject and left dislocated elements phrase separately from the verb phrase:

(17) Luganda (Hyman & Katamba 2010; Pak 2008: 135); underlining indicates HTA domain
a. (nj-ógérá kú bítábó by-á Mùkàsà)
I-talk LOC CL8.book 8-POSS CL1.Mukasa
'I'm talking about Mukasa's books.'
b. (tè-bá-lì-lù-yìmbá á-bá-límí ó-lú-yîmbá)
NEG-2SBJ-FUT-11OBJ-sing AUG-CL2-farmer AUG-CL11-song
'They will not sing it, the farmers, the song.'
c. (òmùlènzì) (à-gúlírá Múkásá kááwà)
CL1.boy 1SBJ-buy.for CL1.Mukasa coffee
'The boy is buying Mukasa some coffee.'
d. (òmùlènzì) (Mùkàsà) (à-mú-gúlírá kááwà)
CL1.boy CL1.Mukasa 1SBJ-1OBJ-buy.for coffee
'The boy, Mukasa, [he] is buying him some coffee.'

3.2 ACCOUNTING FOR THE DATA IN THE EDGE-BASED APPROACH

The edge-based alignment constraints in (7) and (8) straightforwardly optimize phrasing heads with their complements. The constraints, then, account for the phrasing of simple

[1] The tone system of Luganda is extremely complex, and so we present here only the essentials of HTA necessary to follow the analysis. The interested reader should consult Pak (2008) and especially Hyman & Katamba (1993, 2010), Hyman, Katamba & Walusimbi (1987) and references therein for more detailed discussion.

sentences, *except* that these constraints optimize always phrasing subjects with a following VP. To account for data in Chichewa, Luganda and Zulu where the subject phrases separately from the following VP, we follow Cheng & Downing (2009) in proposing that when we find a phrase break, the subject is actually left dislocated, and thus outside of the CP.[2] The left dislocated subject has the same phrasing as a left dislocated object. This is illustrated in (18) for Zulu and Chichewa; a Luganda example is found in (17d), above.

(18) Pre-subject left dislocated topic
Durban Zulu (Cheng & Downing 2009)
a. (ámá-pheeph') **[**$_{CP}$ [$_{IP}$ (úm-mél' ú-wá-sayín-íile)]]]
CL6-paper CL1-lawyer 1SUBJ-6OBJ-sign-PERF.DJ
'The lawyer *signed* the papers.'/ 'The papers, the lawyer *signed*.'
Chichewa (Kanerva 1990: 102, Fig. 110c)
b. (a-leenje) **[**$_{CP}$ [$_{IP}$ (zi-ná-wá-luuma)]]] (njúuchi)
CL2-hunter 10SUBJ-PAST2-2OBJ-bite CL10.bees
'The hunters, they bit them, the bees [did].'

To briefly summarize Cheng & Downing's analysis (2009), adjuncts (left/right-dislocated phrases, non-restrictive relative clauses, adjunct clauses) are not syntactically selected by what precedes or follows. They are attached on a separate plane: cf. Chomsky (2004); see also An (2007).[3] As a result, adjuncts are phrased separately from adjacent vP/CP. Subjects have variable phrasing in Chichewa and Zulu, because they can either occur clause internally, or they can be left dislocated like other DPs. In Luganda, Pak (2008) argues that subjects are always CP-external. The two possible syntactic positions for subjects account for the two possible phrasings. To account for the variability in phrasing of subjects in Kinyambo, we adopt Bickmore's (1990) branchingness analysis. (More on this in the next section.)

3.3 PROBLEMS FOR THE SPELL-OUT DOMAIN APPROACH

The phrasing expected under the spell-out domain approach is repeated below from (10):

(19) Relevant structures (assuming the verb has raised above vP) and spell-out domains
simple sentence[$_{CP}$ [$_{TP}$ **subject verb** [$_{vP}$ [$_{VP}$ **IO DO**]]

As we have seen, the actual phrasing in simple sentences in all four Bantu languages is quite different. The whole verb phrase is one prosodic phrase, and the IO and DO are phrased with the verb. In Chichewa, Kinyambo and Zulu, the subject only variably phrases with the verb; while in Luganda the subject always phrases separately from the verb.

Proposals to get around these problems in a spell-out domain approach remain problematic. For example, Dobashi (2004, 2009, 2010) – to fix the "Assembly Problem" (a linearization problem) – proposes that the leftmost element in each unit of spell-out is left behind for the next spell-out:

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[2] See Morimoto (2000), van der Wal (2009), Zerbian (2006) for discussion of the topic-like properties of subjects in Bantu languages. See Feldhausen (2010) for an alternative OT analysis of the phrasing of left-dislocated topics.

[3] See, too, Chen (1987), which appeals to a complement-adjunct distinction in conditioning prosodic phrasing.

(20) predicted phrasing with V raised to v (= (7) in Dobashi 2010)
(C NP_{subj}) (Infl V) (NP_{obj})

This now allows the subject to be phrased separately from the verb. However, the proposal still has two problems, to be discussed in turn. First, the subject is predicted to always be phrased separately from the verb. Second, the object is predicted to be phrased separately from the verb, and in case of two objects, the two objects are predicted to be split in two different prosodic phrases: (C NP_{subj}) (Infl V NP_{IO}) (NP_{DO}) - cf. (19). To account for the phrasing of the subject with the verb, Dobashi proposes that rephrasing is allowed, but only in the phonological component, for prosodic reasons: e.g., to satisfy a minimality constraint requiring a phonological phrase to have at least two phonological words; cf. Inkelas & Zec (1995), Nespor & Vogel (1986), Selkirk (2011). An example of how rephrasing works is provided by Dobashi's (2004, 2010) account of the phrasing of subjects in Kinyambo, illustrated in (15b, c), repeated here as (21a, b):

(21) a. /aba-kózi bá-ka-júna / → (abakozi bákajúna)
CL2-workers 2SUBJ-TAM-help
'The workers helped.'
b. /aba-kózi bakúru bá-ka-júna / → (abakozi bakúru) (bákajúna)
CL2-workers 2.mature 2SUBJ-TAM-help
'The mature workers helped.'

For (21a), the syntactic derivation yields the phrasing in (22):

(22) (abakózi) (bá-ka-júna) → phonological rephrasing → (abakozi bákajúna)

Because the subject (the leftward constituent) violates the minimal size constraint, rightward phonological rephrasing applies. For (21b), the syntactic derivation yields the phrasing indicated in (21b). Because the subject satisfies the minimal size constraint, no rephrasing applies even though the verb is subminimal (there is nothing to the right of the verb for it to rephrase with). Rephrasing in the case of objects would presumably work the same way: the verb is one phonological word, thus phonological rephrasing with the object(s) is triggered.

There are, however, problems with the rephrasing proposal. In the case of Chichewa and Zulu, subminimal subjects are only variably phrased with the verb (see (12c) and (13c), above). Under Dobashi's account, this variability is not explained.[4] Furthermore, under Dobashi's account, when the subject is phrased separately from the verb, it is not linked to a particular discourse interpretation (e.g., topic). Finally, a verb and two objects cannot be phrased together, as rephrasing is not applicable. Dobashi (2004) proposes to account for the phrasing of objects through object movement to vP. If the object is moved out of the vP spell-out domain, it will not be phrased separately from the verb. However, this proposal faces a number of problems: (1) the IO and DO order has to be maintained; (2) typically, any movement of an object out of a verb phrase requires object marking on the verb; (3) there is no independent evidence for movement to vP (see also Cheng and Downing, to appear, on immediately after the verb position in Zulu).

To sum up this section, the Edge-based approach easily accounts for the data, while the spell-out domain approach has serious problems.

[4] See Downing & Mtenje, in press, for arguments against a branchingness account for Chichewa.

4 PHRASING IN RESTRICTIVE RELATIVE CLAUSES

4.1 THE DATA

For restrictive relative clauses, we find a similar phrasing pattern in Zulu, Chichewa and Luganda (no information is available for Kinyambo), namely, the head and the following relative clause phrase together. This is illustrated in the data below:

(23) Phrasing of restrictive relative clauses (set off by square brackets)
Chichewa (Downing & Mtenje, in press)
a. (ma-kóló a-na-pátsíra [$_{DP}$ [$_{CP}$ mwaná a-méné á-ná-wa-chezéera]])
CL6-parent 6SUBJ-PST1-give CL1.child 1-REL 1SUBJ-PST2-6OBJ-visit
([$_{DP}$ ndalámá zá mú-longo wáake]])
CL10.money 10.of CL1-sister 1.her
'The parents gave [the child who visited them] money for her sister.'
Durban Zulu (Cheng & Downing 2007, 2009)
b. (Si-phul' [$_{CP}$ ím-baz' é-théngwée námhláánje])
we-break CL9-axe REL9SUBJ-buy.PASS.TAM today
'We broke [the axe that has been bought today].'
Luganda (Pak 2008: 154)
c. (nj-ágálá ókúfúúmbírá Músóké [$_{CP}$ lúmóóndé ómúkyálà
I-want INF.cook.for CL1.Musoke CL1a.potato CL1.lady
gwè y-â-m-pà])
1.REL 1SBJ-PAST-ME-give
'I want to cook Musoke [the potato that the lady gave me].'

As work like An (2007) and Wagner (2010) notes, it is common, cross-linguistically, for relative clauses to phrase with their heads. This is the phrasing expected in the Edge-based approach: it satisfies the constraint in (7) right-aligning CP phases and Intonation Phrases.

4.2 PROBLEMS FOR THE SPELL OUT DOMAIN APPROACH

The spell-out domain approach predicts a different phrasing for relative clauses, as shown below (repeated from (10), above):

(24) We invited [$_{DP}$ the [$_{CP}$ students [$_{C'}$ that [$_{TP}$ **Tracy taught to ski**]]] to visit the Alps.

As we can see, the head and complementiser are expected to phrase separately from the relative clause, as they are in a separate spell-out domain. The data in the previous section is obviously problematic, as the head phrases with the relative clause.

To get around this problem, Pak (2008: 161) proposes that Luganda relative clauses have a reduced structure (i.e. no CP phase - cf. (4a)):

(25) Reduced clause analysis of Luganda restrictive relative clause (adapted, Pak 2008: 161, Fig. 49); preverbal relative marker is italicized.
[$_{NP}$ [$_{NP}$ ékítábó] [$_{TP}$ [$_{DP}$ *Op*$_j$] [$_{TP}$ [$_{DP}$ ómúlénzí$_i$] [$_{T'}$ [$_{T}$ *kye*$_{Agr}$ y-á-lábà$_k$] [$_{vP}$ t$_i$ t$_k$ t$_j$]]]]]
CL7.book CL1.boy 7.REL 1SBJ-PAST-see
'…the book the boy saw'

The advantage of this analysis is that "reduced" relative clauses will then be similar in phrasing to other reduced complement clauses:

(26) (nj-ágál' ómúlénzí á-wándííkér-ê Mùkàsà èbbàlúwà)
I-want CL1.boy 1SUBJ-write.to-MOOD CL1.Mukasa CL9.letter
'I want the boy to write Mukasa a letter.'

However, even if the phrasing of Luganda relative clauses can be accounted for by analyzing them as "reduced" relative clauses, this account cannot be extended to other Bantu languages. In Chichewa, for example, the relative marker, *-méné* (homophonous with the emphatic demonstrative, with class-agreement with the head) introduces the RC, as shown in (27a). Chichewa relative clauses therefore cannot be easily analyzed as reduced relative clauses. Further, non-reduced embedded clauses, like complements of *think/say* verbs, also phrase with what precedes, just like restrictive RCs. This is shown in (27b):

(27) Chichewa
a. *relative clause*
(A-ná-kwíyá ndí [$_{CP}$ m-phunzitsi *a-méné* a-lendó
2SUBJ-PST2-get angry with CL1-teacher 1-REL CL2-visitor
á-ná-mu-gulílá zóóváala])
2SUBJ-PST2-1OBJ-buy.for CL10.clothes
'They got angry at [the teacher for whom the visitors bought clothes].'
b. *embedded clause* (Kanerva 1990: 117)
([$_{CP}$ Mavúuto) (a-ku-gániza [$_{CP}$ kutí mw-alá úu-gwa]])
CL1.Mavuto 1SUBJ-PRES-think that CL3-rock 3SUBJ-fall
'Mavuto thinks that the rock will fall.'

To sum up this section, the edge-based approach also easily accounts for the restrictive relative clause data, while the spell out domain approach has only problems.

5 CONCLUSION

The proposal that prosodic domains match spell-out domains is attractively simple: indeed, it is the null hypothesis. However, it wrongly predicts that in many (Bantu) languages, heads should not phrase with their complements. Syntactic proposals to get around these problems remain problematic, as they are ad hoc and do not account for a wide range of available data. The spell-out domain approach also cannot account for the fact that other factors, both syntactic and prosodic, besides spell-out domains, may condition prosodic phrases. In contrast, we have shown that an edge-based approach straightforwardly accounts for (a) the fact that heads and complements phrase together, and (b) the variable phrasing of subjects, and (c) the interaction of other syntactic and prosodic factors in conditioning prosodic phrasing. In short, the best account of prosodic phrasing is provided by a "syntactically informed" theory, rather than by a syntax-driven theory.

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