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The Prosody and Syntax of Zulu Relative Clauses^{*}

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1. Introduction

In the most detailed previous study of prosodic phrasing in Nguni Bantu languages, Jokwani's (1995) study of Xhosa, it appears that the phrasing is quite straightforward. As shown in (1a-c), the whole (maximal) clause is parsed into a single prosodic phrase (in parentheses). As shown in (1d, e): both right- and left-dislocated elements form a separate prosodic phrase.

(1) Xhosa Prosodic Phrasing (Jokwani 1995: 86, 93, 49)

- a. (ndi-bhalél' úmam' íncwa:dí) 'I am writing a letter to/for my mother.'
- b. (ba-zám' úku-lim' úm-bó:na) 'They try to cultivate maize.'
- c. (abá-ntwana ba-kháb' í-bhó:la) 'The children are kicking the ball.'
- d. (bá-ya-yi-vú:l') (íncwa:dí) 'They open it, the book.'
- e. (íncwa:dí) (bá-ya-yi-vú:la) '[As for] the book, they open it.'

Jokwani suggests this data can be accounted for by placing a prosodic phrase break both at the right and at the left edges of a clause: that is, a prosodic phrase is roughly coextensive with a CP. The prosody of restrictive relative clauses and related structures, as they have an embedded CP, could provide crucial evidence that Nguni prosodic phrases are consistently coextensive with CP, however Jokwani (1995) does not examine them.

In this paper we present a study of Durban Zulu, another Nguni language spoken in South Africa. We show first that Zulu has basically the same prosodic phrasing as Xhosa for data comparable to that in (1): prosodic phrases are roughly coextensive with a maximal clause. However, the prosodic phrasing of restrictive relative clauses shows that it is not accurate to propose that, formally, prosodic phrases are consistently coextensive with CPs in Zulu. While such a phrasing algorithm correctly predicts that there should be a prosodic phrase boundary at the right edge of the relative clause, it wrongly predicts that there should either be a prosodic phrase break separating the head noun from the rest of the relative clause (in a traditional analysis) or one separating the whole relative clause including the internal head from the rest of the sentence, in a Kaynian analysis. We argue in section 2 that restrictive relative clauses provide evidence that prosodic phrasing is most consistently conditioned only by the right edge of CP in Zulu. Further evidence for the primacy of right edges of CP in conditioning prosodic phrasing comes from the fact that, in Zulu and in Xhosa, there is no prosodic phrase break preceding a sentential complement, as shown in (1b).

In sections 3 and 4, we examine the phrasing of structures related to restrictive relative clauses, namely, non-restrictive relatives and clefts. These constructions appear to be problematic for the analysis, as we find a consistent prosodic phrase

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boundary preceding these relative clauses, separating them from the head. However, we argue that the difference in phrasing between restrictive relatives and the related constructions falls out straightforwardly from their syntactic analysis. For clefts, we argue that their structure is comparable to equatives, yielding a right CP edge preceding the relative clause. For non-restrictive relatives, we argue that the relative clause CP forms a distinct syntactic phase from its head due to its adjunct status. Left CP edges only condition prosodic phrase breaks, we propose, when they coincide with syntactic phase boundaries.

2. Prosodic phrasing of Zulu restrictive relative clauses

Our study of Durban Zulu prosodic phrasing shows that Jokweni's (1995) findings for Xhosa, shown in (1), find a parallel, for the most part, in Durban Zulu. The primary prosodic correlate of the phrasing is that the phrase penult vowel is lengthened. In some tonal contexts, we also see tonal alternations conditioned by prosodic phrasing. For example, 'children' is often realized with a High tone through the penult – *ábá-ntwána*... – phrase-medially, but with a High tone only through the antepenult – *ábá-ntwa:na* – phrase-finally.¹ As shown in (2a-c), a maximal clause with the neutral SVO word order is parsed into a single prosodic phrase (in parentheses). As shown in (2d), right-dislocated elements are consistently phrased separately from what precedes. However, we find an asymmetry in the phrasing of left- vs. right-dislocated elements in Durban Zulu. As shown in (2e), left-dislocated elements commonly phrase with what follows; they are not phrased separately as in Xhosa²:

(2) Durban Zulu phrasing for data comparable to Xhosa data in (1)

- a. [_{CP}(úm-fúndísi ú-fúndel-ê: ábá-zal' ín-cwa:di)].
1-teacher 1-read to-TAM 2-parent 9-letter
'The teacher read to the parents a letter.'
- b. [_{CP}(Si-khólwa [_{CP} úkúth' ábá-ntwána bá-dlalá phá:ndle)])].
we-believe that 2-child 2-play outside
'We believe that the children are playing outside.'
- c. [_{CP}(ízin-g`áne zi-hlúph' ís-álúkwa:zi)].
10-child 10-bother 7-old woman
'The children are bothering the old woman.'
- d. [_{CP} [_{CP} (úm-fúndísi ú-yí-thól-é é-táfúle:-ni)] (ín-dánda:tho)].
1-teacher SM1-OM9-find-TAM Loc5-table-Loc 9-ring
'The teacher found it on the table, the ring.'
- e. [_{CP}(ízi-vakáshi [_{CP} ngi-zi-phekél' í-nya:ma)])].
10-visitor I-OM10-cook for 9-meat
'The visitors, I am cooking them some meat.'

The complex sentence with a sentential complement, (2b), and the sentence with left-dislocation, (2e), show that the correspondence between CP edges and prosodic phrasing edges is, indeed, only a rough one, as the left edge of CP is not separated from what precedes by a prosodic phrase break. The next section shows that the

¹ Work like Downing (1990) and Cassimjee (1998) can be consulted for more detailed discussion of Nguni tone patterns, including the phrasal conditions on High tone spread/shift.

² An asymmetry in the prosodic phrasing of left- vs. right-dislocations is found in other Bantu languages, like Haya (Byarushengo et al. 1976) and Northern Sotho (Zerbian 2006). See these and Downing (2002) for further discussion.

phrasing of restrictive relative clauses provides more evidence that left CP edges do not consistently trigger prosodic phrase breaks in Durban Zulu, while right CP edges do.

2.1 Prosodic phrasing in restrictive relative clauses: description

As a background to the discussion of the prosodic phrasing of relative clauses in Zulu, one needs to bear in mind the following points concerning the morphology of relatives (see Doke (1961) and Zeller (2004, 2006) for more detailed discussion). First, there is no relative pronoun. A relative clause is identified by having the relative form of the subject marker on the relative verb for both subject and object relatives. A relative verbal enclitic is also found in some tenses when the relative verb is clause-final.

The essential phonological point illustrated by the data below is that there is a phrase break at the right edge of the relative clause. However, there is no phrase break either preceding the relative clause or preceding its head. (Note that the syntactic constituency indicated in the relative clause data assumes a Kaynian analysis of relatives (Kayne 1994); this will be motivated in section 4.)

(3) Zulu restrictive relative clauses, Subject relatives

- a. [_{CP} [_{DP} [_{CP} (Ín-dod' é-gqoke ísí-gqo:ko)]] í-bon-é ízi-vaká:shi)].
 9-man REL9-wear 7-hat 9-see-TAM 8-visitor
 ‘The man who is wearing a hat saw the visitors.’
- b. [_{CP} [_{DP} [_{CP} (úm-fúnd'ísi ó-thól-é: ín-dánda:tho)]] ú-zo-thóla
 1-teacher REL1-find-TAM 9-ring 1-Fut-get
 úm-klóme:lo)].
 3-reward
 ‘The teacher who found the ring will get a reward.’
- c. [_{CP} [_{DP} [_{CP} (Ábá-ntwán' ábá-dlal' é-si-kóle:-ni)]] bá-hlál' éd`úzáne
 2-child REL2-play Loc-7-school-Loc 2-live near
 nésí-kó:le)].
 to7-school
 ‘The children who are playing at the school live near the school.’
- d. [_{CP} (sí-phul' [_{DP} [_{CP} ím-baz' é-théngw-é námhlâ:nje)]]].
 we-break 9-axe REL9-be bought-TAM today
 ‘We broke the axe that has been bought today.’

As shown in (4), for object relatives, besides the relative subject marking on the verb, a resumptive object must occur in the relative clause, either an object class prefix (OM) or a full pronoun agreeing with the head. Phonologically, we continue to find a phrase break only at the right edge of the relative clause.

(4) Zulu restrictive relative clauses, Object relatives

- a. [CP [DP [CP (ízi-túl' á-má-khósíkaz' á-zí-thénga:-yo)]] z-akhw-é
10-chair 6-women REL6-OM10-buy-Rel 10-be made
ithí:na)].
by us
'The chairs the women are buying were made by us.'
- b. [CP (sí-thánd' [DP [CP (ísí-gqok' ín-dod' é-si-gqok-ilê:-yo)]]].
we-like 6-hat 9-man REL9-OM6-wear-TAM-Rel
'We like the hat the man is wearing.'
- c. [CP [DP [CP (ín-dod' ízi-nj' ézi-yí-jahâ:-yo)]] í-ntshóntsh' í-qhû:de)].
9-man 10-dog REL10-OM9-chase-Rel 9-steal 5-rooster
'The man who the dogs are chasing stole a rooster.'
- d. [CP [DP [CP (ín-kúkh' éngi-yi-phéka:-yo)]] í-fíké nézi-vaká:shi)].
9-chicken REL1-OM9-cook-REL 9-came with 8-visitor
'The chicken I am cooking came with the visitors.'
[intended: I am cooking the visitors' chicken.]

This data shows that restrictive relative clauses, like the sentential complements in (1b) (2b), are prosodically closely bound to the string to their left. They are prosodically separated, however, from the string to their right. In the next section we develop a phonological analysis which accounts for this asymmetry.

2.2 Prosodic analysis

The Edge alignment theory of prosodic phrasing developed in work like Selkirk (1986, 1995, 2000) and Truckenbrodt (1995, 1999, 2005) assumes that edge-based phrasing asymmetries like those described in the preceding section are very common cross-linguistically. Indeed, the Zulu relative clause phrasing described in the preceding section is strikingly similar to the phrasing of Southern German relative clauses. As Truckenbrodt (2005) shows, in other constructions in this dialect of German, the Intonation Phrase is coextensive with a CP (root clause). But there is a phrase boundary only at the right edge of restrictive relative clauses and other embedded CPs, not at the left edge.

To account for such asymmetries, the basic parsing algorithm in the Edge-based theory requires one edge of a major syntactic constituent (XP or CP) to coincide with an edge of the corresponding prosodic constituent (Phonological Phrase or Intonation Phrase, respectively). In Optimality Theory (OT), this is formalized in terms of constraints aligning edges of prosodic and syntactic constituents. The right-alignment constraint in (5), proposed by Truckenbrodt (2005) to account for phrasing of Southern German embedded CPs, optimizes an Intonation Phrase break following a relative clause and other CPs:³

- (5) ALIGN R(CP, I) (Truckenbrodt 2005: fig (17))
Align the right edge of each CP with the right edge of an Intonation Phrase (I).

³ It is interesting to note that Cheng & Kula (2006) argue that the opposite edge alignment constraint accounts for the phrasing of relative clauses in Bemba. This constraint is satisfied if the left edge of CP (that is, in the case of restrictive relative clauses, the head) is preceded by a prosodic phrase break. However, since all of the restrictive relatives in Cheng & Kula (2006) are sentence-initial, it is unclear from their data whether Bemba actually has the opposite parameter setting for edge alignment from Zulu.

This constraint straightforwardly accounts for the phrasing we find in Zulu restrictive relative clauses, plus the data in (2a-e). Notice that the asymmetry in the phrasing of left- vs. right-dislocated elements also falls out straightforwardly from this constraint, as right-dislocated elements are preceded by a right CP edge, while left-dislocated elements are not.⁴ However, as we shall see in the next sections, the phrasing of non-restrictive relatives and clefts is problematic for the generalization formalized in (5), as left CP edges appear to trigger prosodic breaks in these constructions. In sections 3 and 4, we present this problematic relative clause related data and develop a syntactic analysis which accounts for the fact that left CP edges coincide with prosodic phrase breaks for some Zulu relative clause constructions, while others do not.

3. More evidence for ALIGNR from the phrasing of clefts

The data so far illustrates the importance of right CP edges for prosodic phrasing in Zulu. The constraint in (5) must be high-ranked in this language, as it is never violated. We show in this section that the prosodic phrasing of clefts would appear, at first blush, to motivate a corresponding constraint aligning the left edge of (some) CPs with an Intonation Phrase. In fact, we argue that the phrasing of clefts is straightforwardly accounted for by the ALIGNR constraint in (5), given the proper syntactic analysis of the structure of Zulu clefts.

Clefts are obligatory in Durban Zulu when questioning the subject and when answering questions on the subject. Otherwise they indicate contrastive or identificational focus.⁵ Clefts consist of a head noun followed by a relative clause, formally identical to those in (3). The copula introducing a clefted head is most commonly expressed as a depressor (initial Low) tone (with no segmental marking). In contrast to the restrictive relative clauses in (3) and (4), we find a phrase break following the head. These characteristics are illustrated by the data in (6):

(6) Clefts vs. subject relatives

- a. (i) *clefted subject*, Answers to ‘Who found the ring that you lost?’
 (um-fúnd‘í:si) (ó-thól-ê: índándatho e-bí-ngi-láhléké:le).
 Cop1-teacher REL1-find-TAM 9-ring REL-TAM-I-lost
 ‘It is the teacher who found the ring that I lost.’
- (ii) *subject relative* (=3b)
 (úm-fúnd‘ísi ó-thól-é: ín-dánda:tho) úzo-thóla úm-klóme:lo).
 1-teacher REL1-find-TAM 9-ring 1-Fut-get 3-reward
 ‘The teacher who found the ring will get a reward.’

⁴ See Cheng & Downing (2006, 2007) for arguments that right-dislocated elements are preceded by a right CP edge. Cheng & Downing (2006, 2007) also show that the prosodic phrasing of left-dislocations is more complicated than this, as there is variability in their phrasing. For this reason, we concentrate on the phrasing of relative clause-type constructions in this paper. However, our current research suggests that the phase-based analysis of prosodic phrasing developed in section 4, below, extends to account for variation we find in the phrasing of left-dislocated DPs.

⁵ See Zerbian (2006) for detailed discussion of an analogous distribution of clefts in Northern Sotho.

- b. (i) *clefted subject*, Answers, ‘Who is playing at school?’
 (Abá-ntwa:n’) (abá-dlal’ é-sí-kóle:-ni).
 COP2-child REL2-play Loc-7- school-Loc
 ‘It is the children who are playing at the school.’
- (ii) *subject relative* (=3c)
 (Ábá-ntwán’ ábá-dlal’ é-sí-kóle:-ni) bá-hlál’ éd`úzáne
 2-child REL2-play Loc-7-school-Loc 2-play near
 nésí-kó:le).
 to7-school
 ‘The children who are playing at the school live near the school.’

More clefts

- c. [In answer to, ‘Who is cooking tonight?’]
 (u-Sí:ph’) (ó-zo-phéka ku-sí:hlwa).
 Cop1a-Sipho REL1-TAM-cook evening
 ‘It is Sipho who is cooking tonight.’
- d. [In answer to, ‘Who found the ring?’]
 (i-mî:na) (ó-thól-ê: ín-dánda:tho).
 Cop-I REL1-find-TAM 9-ring
 ‘It’s me who found the ring.’

It has long been established (at least since Schachter 1973) that relative clauses and cleft sentences are similar, and we see the same in Zulu. In (6), we see that the clause following the clefted head has the same relative agreement/concord as regular relative clauses, showing that Zulu clefts have within them the structure of a relative. This has prompted many to analyze clefts as having the same structure as relatives, with the clefted head as the relative head noun (see Svenonius (1998) among others for discussion).

If we adopt the syntactic analysis of clefts given in (7), which is basically the structure proposed by É. Kiss (1998) for English clefts, we can see that clefts would pose a problem for the alignment constraint stated in (5):

- (7) [IP ___ copula [FP clefted-phrase [CP clausal predicate/RC]]]

Given the structure in (7), the prosodic break between the clefted head and the rest of the cleft is not accounted for by the constraint in (5), as the clefted head does not fall at the right edge of CP. This prosodic break appears to motivate a left CP edge alignment constraint.

This motivation disappears, however, given an alternative analysis of cleft structure. We propose that the “relative clause” in clefts in Durban Zulu is a headless relative clause. The argument is as follows. First, note that restrictive relative clauses in Zulu are morpho-syntactically indistinguishable from a headless (free) relative:

- (8) a. (úm-fúnd`ísi ó-thól-é: ín-dánda:tho) ú-zo-thóla úm-klóme:lo)
 1-teacher REL1-find-TAM 9-ring 1-Fut-get 3-reward
 ‘The teacher who found the ring will get a reward.’
- b. Ó-thól-é: ín-dánda:tho ú-zo:-thóla úm-klóme:lo.
 REL1-find-TAM 9-ring 1-Fut-get 3-reward
 ‘Whoever found the ring/The one who found the ring, he/she will get a reward.’

A free relative can be analyzed as a relative clause containing a null head; in other words, it is a DP. This makes it possible to analyze clefts differently from restrictive relatives, but rather more like non-restrictive relatives. Let us reconsider the structure of clefts. Work like Schachter (1973) for English, Ouhalla (1999) for Moroccan Arabic, and Clech et al. (1999), Doetjes et al. (2004) for French have shown that cleft sentences have properties in common with equatives in many languages.⁶ For example, equatives are typically reversible, as (9a,b) from Durban Zulu show:

- (9) a. ú-Si:pho (ng)-u´m-phe:ki
 1aSipho cop-1-cook
 ‘Sipho is the chef.’
 (In answering: “What is Sipho’s job/what is Sipho doing?”)
- b. ú´m-phe:ki ng-u-Sî:pho
 1-cook cop-1a-Sipho
 ‘The chef is Sipho.’

From the position of the long vowels in the above data, we can see that both halves of the equative construction are parsed into separate Intonation Phrases. Clefts – like equatives – are reversible in Durban Zulu. And like equatives, each half – the clefted head and the relative clause – is parsed into a separate Intonation Phrase:

(10) Reversibility of clefts

- a. (i) [In answer to, ‘Who is carrying the basket?]
 (u-Nhlâ:nhla) (ó-thwél’ ú-bhasikí:di).
 Cop.1-Nhlanhla Rel.1-carry 1a-basket
 ‘It is Nhlanhla who is carrying the basket.’

OR

- (ii) (Ó-thwél’ ú-bhasikí:di) (u-Nhlâ:nhla).
 Rel.1-carry 1a-basket Cop.1-Nhlanhla

- b. (i) (u-Sî:phó) (ó-phéka:-yo).
 Cop1a-Sipho REL1-cook-REL
 ‘It is Sipho who cooks/is cooking.’

OR

- b. (ii) (ó-phéka:-yo) (ngu-Sî:pho).
 REL1-cook-REL Cop1a-Sipho

- c. (i) (abá-ntwa:na) (éngi-zo-khúlúma na:-bo).
 Cop.2-child RELI-Fut-talk with-2
 ‘The children are the ones I will talk to.’

OR

- c. (ii) (éngi-zo-khúlúma na:bo) (ng-abá-ntwa:na).
 RELI-Fut-talk with-2 Cop-2-child

We conclude from this that the relative clause following the cleft is a headless (free) relative (DP), with the syntactic and prosodic structure shown in (11):

⁶ It should be noted that these analyses differ in the details of how they derive the similarities between clefts and equatives.

- (11) [In answer to, ‘Who is cooking tonight?’]
 (u-Sí:ph’) (ó-zo-phéka ku-sí:hlwa)
 Cop1a-Sipho REL1-TAM-cook evening
 ‘Sipho is cooking tonight.’
 It is Sipho; [_{DP} (the one) [_{CP} who is cooking this evening]].

In light of the prosodic phrasing – i.e. the clefted head is phrased separately from the relative clause – and the syntactic similarity to equatives, we propose that the clefted head is itself a CP:

- (12) [[_{CP} [_{IP} u-Sí:ph’]]] [_{DP} ∅ [_{CP} ó-zo-phéka ku-sí:hlwa]]
 ‘It’s Sipho, the one who is cooking this evening.’

Under this analysis, the prosodic phrasing in clefts – with the clefted head and the relative clause in separate Intonation Phrases – is optimized by the constraint in (5). The clefted head is syntactically parsed into a CP, and so is expected to be followed by an Intonation Phrase break.⁷

To sum up this section, we have shown that the prosodic phrasing of clefts falls out from the alignment constraint in (5), if clefts are given the same syntactic analysis as equatives. In this analysis, the clefted head falls at the right edge of a CP and is optimally phrased separately from the following relative clause.

4. Why some left CP edges matter

From the data so far, any corresponding constraint aligning a left CP edge with a left Intonation Phrase boundary would appear to be so low-ranked as to have no effect on prosodic phrasing in Durban Zulu. However, non-restrictive relative clauses show that left CP edges do sometimes count for Intonation Phrasing in Zulu. This section provides an explanation of why this is so.

Work like Burton-Roberts (2005), Cheng & Kula (2006), Kanerva (1990), Nespor & Vogel (1986) and Truckenbrodt (2005) has shown that it is common, cross-linguistically, for non-restrictive relative clauses (like other parentheticals) to phrase separately from the surrounding string. The data in (13) shows that in Durban Zulu, too, non-restrictive relative clauses – morpho-syntactically identical to restrictive relatives – are parsed into their own Intonation Phrase. Note that this contrasts with restrictive relative clauses in (3), which phrase with the preceding head noun. On the other hand, the head nouns in both restrictive and non-restrictive relatives are phrased together with the selecting verb, as shown in (4b) and (13c).

⁷ The DP (containing the relative clause CP) may be adjoined to the matrix CP (see Clech et al. 1999 for detailed discussion of French clefts).

- (13) Zulu non-restrictive relative clauses (prosodic phrasing in parentheses)
- a. [_{CP} [_{DP} [_{DP} (Ú-nhla:nhlá)] [_{CP} (ó-théngé ámá-tha:ngá)]]] ú-wá-thwéle
 1-Nhlanhla REL1-buy 6-pumpkin SM1-OM6-carry
 ng`ó-bhasikí:di].
 with1a-basket
 ‘Nhlanhla, who bought the pumpkins, is carrying them in a basket.’
- b. [_{CP} [_{DP} (úMnúmzane D`ú:be)] [_{CP} (ó-bhek’ émnya:ngo)]]]
 Mr. Dube REL1-look outside
 ng`ú:-thíshá wa:mi].
 Cop1-teacher my
 ‘Mr Dube, who’s looking outside, is my teacher.’
- c. [_{CP} (si-mem’ [_{DP} [_{DP} ú-Ja:bu)] [_{CP} (o-m-ázi:-yo)]]] é-dilî:-ni].
 we-invite 1a-Jabu RELyou-OM1-know-REL Loc9-party-Loc
 ‘We are inviting Jabu, who you know, to the party.’

Assuming a Kaynian analysis of restrictive relative clauses (see Bianchi 2000 among others for variations of Kaynian analyses), the syntactic distinction between the restrictive and non-restrictive relatives partially explains the phrasing difference. As shown in (14a), the head of a restrictive relative is within the CP, and the CP is a complement of the D head. In contrast, in a non-restrictive relative (14b), the relative clause is adjoined to the DP, and the head noun is not included in the CP:

- (14) a. Restrictive relatives b. Non-restrictive relative (Demirdache 1991)
- DP

├── D

└── CP

├── HEADN

└── C’

└── RC

DP

├── DP

└── CP

HEAD N

└── RC

Given the structures in (14), the prosodic phrase break following both types of relative clause satisfies the constraint in (5). While the fact that the head noun is positioned outside of CP in non-restrictive relatives does provide a clear-cut syntactic difference between restrictive relatives and non-restrictive relatives, this distinction alone does not directly translate to a prosodic boundary at the left edge of CP. As we have seen in (3d), (4b) and (13c) the head of relative clauses (restrictive and non-restrictive alike) is not phrased separately from the selecting verb.

To account for the prosodic break between the non-restrictive relative and its head, we have to posit an additional constraint. There seem to be just two plausible alternatives given the structure in (14b): either the right edge of DP or the left edge of CP also aligns with an Intonation Phrase boundary. The first option, however, cannot be correct. Since subject DPs, like many left-dislocated DPs, do not necessarily phrase separately from the verb phrase, it is clear that the right edge of DP is not regularly aligned with an Intonation Phrase. The second option also appears to be incorrect. As we have already demonstrated, the left edge of CP does not generally coincide with a prosodic phrase break: neither the head of a restrictive relative clause nor the left edge of a sentential complement is preceded by an Intonation Phrase boundary.

The fact that the left edge of CP appears to align with an Intonation Phrase in the case of non-restrictive relatives but not in other structures suggests another alternative. This alternative relies on two notions: phases and the head-complement (selection) relation. In a nutshell, we propose that CPs are only phases if they are not complements (i.e. not selected). The left edge of a CP is only aligned with an Intonation Phrase if it is a phase.

Following Chomsky (2001), we take CP to be a strong phase. However, we have also seen that adjunct CPs like non-restrictive relative clauses are different from complement CPs in terms of whether the left edge of CP is aligned with an Intonation Phrase break. Adopting typical X-bar theoretic terminology (see Jackendoff 1977, Chomsky 1981, among others), the difference between an adjunct and a complement rests upon the fact that the former is not selected by a head while the latter is. We suggest, then, that a CP does not count as a separate phase, if it is a complement. There are two constructions in which CPs are selected: one is in the case of a sentential complement selected by a verb, and the other involves a restrictive relative clause structure à la Kayne (see (14a), above). These two contrast with other CPs which are not selected, e.g. non-restrictive relative CPs, sentential subjects, and other adjunct clauses.

Work like Kratzer & Selkirk (2007) and references therein show that prosodic phrasing can be conditioned by phases. In the spirit of this work, we propose that the distinction in the phrasing of restrictive vs. non-restrictive relative clauses can be accounted for by adding the following constraints to the analysis:

(15)

- a. ALIGNL(PHASE, I)
Align the left edge of a phase with the left edge of an Intonation Phase (I).
- b. WRAP(CP, I) (Truckenbrodt 2005: fig. (18))
Each CP is contained in a single Intonation Phrase (I).

The prosodic break before a non-restrictive relative clause satisfies the alignment constraint, as the left edge of a non-restrictive relative clause coincides with a phase edge. However, it violates the WRAP constraint, as the maximal CP (root clause plus embedded clause) is not contained in a single Intonation Phrase. (As Truckenbrodt (2005) makes clear, WRAP constraints have the effect of minimizing the number of prosodic phrases that a syntactic domain is parsed into.) The CP containing a restrictive relative clause (or a sentential complement), on the other hand, is not a phase, and so this constraint provides no motivation for a prosodic break at its left edge. The phrasing of restrictive relative clauses and complement clauses therefore satisfy WRAP.

The analysis is exemplified by the tableaux in (16) and (17), which contrast the optimal Intonation Phrasing found with restrictive relative clauses like (4b) with the phrasing found in non-restrictive relative clauses like (13c). A left CP-phase edge is underlined; a non-phasal left CP edge is not:

(16) Phrasing of restrictive relative (4b)

$[\text{CP}(\text{si-thánd}'[\text{DP}[\text{CP}(\text{ísí-gqok}' \text{ ín-dod}' \text{ é-si-gqok-ilê:-yo})]])]$ we-like 6-hat 9-man REL9-OM6-wear-TAM-Rel	ALIGNR	ALL	WRAP
☞ a. $[\text{CP}(\text{si-thánd}'[\text{DP}[\text{CP}(\text{ísí-gqok}' \text{ ín-dod}' \text{ é-si-gqok-ilê:-yo})]])]$.		PHASE	
b. $[\text{CP}(\text{si-thá:nd}')[\text{DP}[\text{CP}(\text{ísí-gqok}' \text{ ín-dod}' \text{ é-si-gqok-ilê:-yo})]])]$.			*!

Candidate (a), where the head of the restrictive relative clause forms an Intonation Phrase with the preceding verb and the following relative clause is optimal, as this phrasing satisfies all of the constraints. Candidate (b), which has an Intonation Phrase break at the left edge of the relative clause, is non optimal, as this phrasing violates WRAP: a maximal CP is optimally parsed into a single Intonation Phrase, unless higher ranked alignment constraints motivate a prosodic break at a left or right CP edge.

(17) Phrasing of non-restrictive relative (13c)

[_{CP} (si-mem' [_{DP} [_{DP} ú-Ja:bu]) [_{CP} (o-m-ázi:-yo)]]] é-dilî:-ni] we-invite 1a-Jabu RELyou-OM1-know-RELLoc9-party- Loc	ALR	ALL PHASE	WRAP
a. [_{CP} (si-mem' [_{DP} [_{DP} ú-Ja:bu]) [_{CP} (o-m-ázi:-yo)]]] é-dilî:-ni].			*
b. [_{CP} (si-mem' [_{DP} [_{DP} ú-Jabu] [_{CP} o-m-ázi:-yo)]]] é-dilî:-ni].		*!	

Candidate (a), where the non-restrictive relative clause forms a separate Intonation Phrase from its head is optimal, as this phrasing satisfies both of the high-ranked alignment constraints. Candidate (b), which has no Intonation Phrase break at the left edge of the non-restrictive relative clause, is non optimal, as this phrasing violates ALIGNL-PHASE: a phasal CP like a non-restrictive relative clause optimally has an Intonation Phrase boundary at its left edge.

5. Conclusion

The prosodic phrasing of Zulu restrictive relatives, non-restrictive relatives and clefts provides a good example to illustrate that syntactic analyses can be informed by phonological analyses and vice versa. As we have seen, prosodic phrasing provides an important cue that these constructions have distinct syntactic analyses. The syntactic analysis of non-restrictive relative clauses supports the proposal that the Intonation Phrase is conditioned, cross-linguistically, not only by CP edges, but also by reference to syntactic phases.

In the analysis proposed in section 4, we have suggested that phases can be relative. That is, the phasehood of CP is relativized as to whether or not it is selected. Selection under this account nullifies phasehood. Further work is required to determine whether this reduction of phasehood is related to the mapping between syntax and phonology, or whether this is also the case in narrow syntax.

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