The role of attachment height in explaining prosodic phrasing in Rutooro[1]

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Rutooro is a Bantu language of Uganda that lacks lexical tone. Instead, prominence in Rutooro is marked with a High tone (H) on the penultimate syllable of the phonological phrase (φ-phrase). Like many languages in the family, syntactic XPs reliably correspond to φ-phrases; however, we find a previously unattested pattern in the prosody of Rutooro adnominal phrases. Head nouns are marked H when they combine with strong determiners and full RCs. In contrast, nouns do not bear an H tone when they combine with weak determiners, adjectives, and reduced RCs. We propose that the distribution of H tones serves as a diagnostic for whether an adnominal is generated in a DP-internal or external position. Reduced object RCs with overt subjects are a special case: the relativized head bears an unexpected H tone, while the subject is all-Low despite the fact that it is a self-contained XP. Also in the realm of reduced RCs, when a relativized head is separated from the RC by an additional modifier, e.g. an adjective, that modifier is realized as all-Low even though it is phrasal. We hypothesize that the attested, nonisomorphic phrasing arose to prevent i) ambiguity and ii) prosodic indeterminacy—when prosodic structure could be the output of more than one syntactic configuration—and was subsequently grammaticalized.

1. INTRODUCTION

Rutooro (E/J.12), a Ugandan Bantu language, is one of only a handful of Bantu languages, most famously including Swahili, Tumbuka, and Pogolo, in which tone is no longer lexically contrastive (Kisseberth & Odden 2003). Although Rutooro does not have contrastive tone, all words in isolation are pronounced with a prominence on the penultimate syllable, which we refer to as High (H) tone (see also Persohn 2017 for Nyakyusa). In our examples, H tones are indicated with a diacritic above the nucleus of prominent syllables, as in (1).[1]

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[1] With the noted exception of the phrases in (2), all of the data presented in this paper come from Barbara Balinda, a 26 year old native speaker from Fort Portal, Uganda. Rutooro is an understudied language; previous work includes a Runyooro-Rutooro grammar (Rubongoya

(1) (a) ku-sóm-a
    C15-read-FV
    'to read'[2]

   (b) a-ka-tuungúro
    AUG-C12-onion
    'onion'

   (c) mpóra
    slowly
    'slowly'

The distribution of H tones is nontrivial in phrasal contexts, where it is neither the case that each word has a H on the penultimate syllable, nor that every utterance is restricted to a single H on the final penult. This puzzle was first noted by Kaji (2009), who discussed phrasal minimal pairs, as in (2). Although (2-a) and (2-b) are segmentally identical, the placement of a single H tone distinguishes between a possessed nominal and a copular clause.

(2) (a) e-ki-tabu   ky-áánge
    AUG-C7-book C7-1SG
    'my book'

   (b) E-ki-tábu   ky-áánge.
    AUG-C7-book C7-1SG
    'The book is mine.'   (Kaji 2009: 242)

When larger sentences are examined, it is possible to find nearly any combination of toneless words and H-marked words, but the phrase-final penult will always be marked with a H tone.

(3) (a) Nii-n-j-a   kw-eend-a ba-taandik-e ku-som
    PROG-1SG.SM-GO-FV c15-want-FV 3PL.SM-start-FV c15-read
    ee-bi-tábu.
    AUG-C7-book
    'I am going to want that they start to read the books.'

   (b) Ííjo   a-bá-ána   b-óóna ba-ka-sóm-a   múú-n-ju.
    yesterday AUG-C2-child C2-all 3SG.SM-PST-read-FV LOC-C9-house
    'Yesterday all the children read in the HOUSE.' (far past)

1999), a Rutooro word list (Kaji 2007), a few papers on tone that take a primarily diachronic perspective (Kaji 2010, 2018), and papers on vowel elision and harmony (Bickmore to appear a, to appear b). Kaji (2009) discusses nominal modification, which is addressed in Section 3. Otherwise, to our knowledge, this paper represents an analysis of entirely novel Rutooro data.

[2] Abbreviations used in glosses are as follows: AUG — augment vowel, APPL — applicative, FV — final vowel, INF — infinitive, LOC — locative, OM — object marker, PL — plural, PST — past, PROG — progressive, REL — relative prefix, SG — singular, SM — subject marker, TAM — tense aspect mood. Cardinal numbers are used to mark noun class.

To account for the distribution of high tones in Rutooro, we propose the High Tone Insertion Rule in (4), which links H tones to the penultimate syllable of each phonological phrase (φ-phrase), as in (5):

(4)   High Tone Insertion Rule: Insert a High tone and link it to the penultimate syllable of every φ-phrase.

(5)   High Tone Insertion

$$
\begin{array}{ccc}
\sigma & & \sigma)\varphi \\
| & & \\
| & & \\
| & & \\
\emptyset & \rightarrow & H
\end{array}
$$

In the sections that follow we examine matrix clauses, DPs, and relative clauses, highlighting the locations of the High tones in each type of structure. Largely based on the correspondence between φ-phrases and syntactic phrases (XPs) in Rutooro, we provide explicit, prosodically-informed, syntactic analyses for Rutorooro's adnominal phrases. In short, the distribution of H tones in the language serves not only as a diagnostic tool for the right-edges of φ-phrases, but also as a diagnostic for syntactic constituency. Before concluding, we discuss apparent exceptions in the phonological phrasing of reduced relative clauses.

1.1. Language background

Rutooro, which is also known as Tooro, is a Bantu language spoken by approximately 850,000 speakers in western Uganda (Simons & Fennig 2017). Other closely related langauges in the Nyooro/Ganda group include Luganda, Runyankore, Ruciga, Nyoora, Soga, and Gwere.

Rutooro is a highly agglutinative, polysynthetic language. SVOX is one common word order, although arguments are often dropped and focused constituents can appear in immediately postverbal position. Most tense/aspect markers are prefixal, although the language also has a series of low aspect markers, as in (9) below.

19 of Bantu's numbered noun classes are attested in Rutooro. As is common for Bantu languages, there are separate classes for singular and plural nouns, and certain plural classes correspond to more than one singular class. Compare the singular and plural forms in (6) and (7):

(6)   (a)   e-**ri**-iso
            AUG-C5-eye
            'eye'

      (b)   a-**ma**-iso
            AUG-C6-eye
            'eyes'

(7) (a) o-**ku**-tu
   AUG-C15-ear
   'ear'

   (b) a-**ma**-tu
   AUG-C6-ear
   'ears'

Rutooro also has rich nominal concord: note how in (8), all of the nominal modifiers are marked with the head noun's class prefix. In (9), the subject's noun class is also represented on the predicate.

(8) e-**bi**-sumuruzo **bi**-taano **by**-aange **by**-oona **bi**-nu
   AUG-C8-key   C8-five C8-my C8-all C8-this
   'all five of these keys of mine'

(9) A-**ba**-ana   **ba**-chuumb-ire e-ki-huro.
   AUG-C2-child C2.SM--cook-FV AUG-C7-meal
   'The children cooked the meal. (near past)'

The final vowel (FV) is a suffixal mood marker that distinguishes between subjunctive -*e* and indicative -*a*. [3] This suffix deletes when the following word begins with a vowel due to a general process of hiatus resolution. When a non-high vowel (V_1) immediately precedes another vowel (V_2), V_1 deletes and V_2 undergoes compensatory lengthening (Bickmore to appear). Example (10), shows an indicative final vowel realized on *nitwiija* 'come,' a subjunctive final vowel realized as *ayaamb-e* 'help' as well as the deletion of a final vowel and subsequent compensatory lengthening on the following vowel in *kw-eend* 'want'.

(10) Ni-tw-iij-a   kw-eend oo-mu-lími   a-yaamb-e Kajúúmba.
   PROG-1PL.SM-come-FV c15-want AUG-C2-farmer 3SG-help-FV Kajumba.
   'We are going to want the farmer to help Kajumba.'

With reference to the specific examples in this paper, the final vowel deletes when the following word begins with an augment (AUG). The augment, also referred to as the pre-prefix or initial vowel in the Bantu literature is inextricably linked to definiteness across the family. The augment is attributed to Proto-Bantu (Meeussen 1967; De Blois 1970), but modern Bantu languages differ with respect to whether or not the augment has been maintained. In those languages that have an augment, differences arise according to its shape (CV-, V-, floating H tone) and its syntactic and semantic distribution. See Halpert to appear for a comprehensive look at the augment in Bantu languages. In Rutooro, the augment is realized as a harmonizing vowel [a-, e-] or [o-] that precedes the noun class prefix.

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[3] An exception to the generalization that a final -*e* indicates subjunctive mood comes from the -*ire* perfective suffix, shown in (9).

2. DISTRIBUTION OF H IN SIMPLE MATRIX CLAUSES

High tones in Rutooro mark the right edge of a prosodic unit that must be greater than the prosodic word, because not all words bear a High tone when they are realized in a phrasal context, as was shown in (3-a) above. At the same time, the prosodic unit at question must be smaller than the intonational phrase, as every word in a clause *can* bear a H tone, given the right context, as was shown in (3-b).The prosodic domain for H tone assignment in Rutooro overlaps substantially with what has been called a phonological phrase (φ-phrase) in accounting for tone distribution in related languages, including Copperbelt Bemba (Kula & Bickmore 2015), Cilungu (Bickmore 2007), Chimwiini (Kisseberth & Abasheikh 2011) and Xitsonga (Selkirk 2011). For these reasons,, we propose that H tones are assigned to the penultimate syllable of the φ-phrase.

In this section, we discuss the location of High tones in simple matrix clauses. In each case we assume that the right edge of words containing a penultimate H sits at the right edge of a phonological phrase. We then provide an explicit syntactic structure for these clauses, demonstrating that there is a reliable correspondence between XPs and φ-phrases in Rutooro.

2.1. Data

In matrix clauses with intransitive verbs, such as those in (11), the subject and the verb each bear a penultimate H tone, which is unmarked in Rutooro orthography, but is indicated with an accute accent in our examples. Each H tone marks the right edge of a phonological phrase (φ-phrase), which is indicated here and in the remainder of the paper with a right parenthesis.

(11) (a) A-ba-lími)φ ba-ka-kór-a)φ
          AUG-C2-farmer C2.SM-PST-work-FV
          'The farmers worked.'
      (b) Kajúúmba)φ a-irúk-a)φ
          Kajumba   3SG.SM-run-FV
          'Kajumba runs.'

The same H-tone distribution obtains in transitive clauses that lack lexical objects: the subject and the verb are each marked H, as in (12)

(12) (a) Tu-ka-bi-gúr-a)φ
          1PL.SM-PST-C8.OM-bought-FV
          'We bought them.'
      (b) Kajúúmba)φ a-raa-bi-gúr-a)φ
          Kajumba   3SG.SM-FUT.C8.OM-buy-FV
          'Kajumba will buy them.'

Turning to transitive sentences with overt objects, as in (13), the verb surfaces as all-Low, but the object is marked with a High tone.

(13) (a) Tu-ka-gur   ee-bi-tábu)φ
           1PL.SM-PST-bought AUG-C8-book
           'We bought the books.'
      (b) Kajúúmba)φ a-raa-gur   ee-n-káíto)φ
           Kajumba   3SG.SM-FUT-buy AUG-C10-shoe
           'Kajumba will buy the shoes.'

The tonal patterns in (11)—(13) indicate that verbs and objects are part of the same φ-phrase, but subjects are separated from verbs by a φ-phrase boundary.

   In ditransitive clauses like those in (14) both the indirect and direct objects are found at the end of a phonological phrase—again, as indicated by the High tone on the penult of each argument that follows the verb.

(14) (a) A-ba-lími)φ   ba-ka-h   oo-mw-áán)φ ee-by-ookúlya)φ
           AUG-C2-farmer 3PL.SM-PST-give AUG-C1-child AUG-C8-food
           'The farmers gave the child the food.'
      (b) A-ba-somésa)φ ba-k-oolek   aa-bá-án)φ   ee-mí-ti)φ
           AUG-C2-teacher 3PL.SM-PST-show AUG-C2-child AUG-C4-tree
           'The teachers showed the children the trees.'

The same pattern is found in the applicative construction (15), where the applicative object and the direct object each bear a High tone on their penult.

(15) (a) A-báá-ntu)φ   ba-raa-som-er)φ   aa-ba-isíki)φ   e-bi-tábu)φ
           AUG-C2-person 3PL.SM-FUT-read-APPL   AUG-C2-girl   AUG-C8-book
           'The people will read the books to the girls.'
      (b) A-ba-záíre)φ   ba-ka-leet-er)φ   oo-mw-áán)φ   ee-bi-yúni)φ
           AUG-C2-parent 3PL.SM-PST-bring-APPL   AUG-C1-child   AUG-C8-yam
           'The parents brought the yams for the child.'

Clauses in which the verb is followed by an adjunct, e.g. a locative phrase (16) or an adverb (17), pattern in the same way as clauses in which the verb is followed by an argument: the verb surfaces as all-Low and each constituent that follows is marked with a High tone on its penultimate syllable.

(16) (a) Ba-ka-byaam-a múú-nju)φ
           3PL.SM-PST-sleep C18-house
           'They slept in the house.'
      (b) A-ba-záíre)φ   Ba-ka-vug-a   matóka)φ ha-Sabííti)φ
           AUG-C2-parent 3PL.SM-PST-drive-FV car   C16.LOC-Sunday
           'The parents drove the car on Sunday.'

(17) (a) Ba-ka-haandik-a   mpóra)φ
           3PL.SM-PST-write-FV slowly
           'They wrote slowly.'

(b) A-báá-ntu)φ ba-som   ee-bi-tábu)φ ku-rúúngi)φ
AUG-C2-person 3PL.SM-read AUG-C8-book C17-well
'The people read the books well.' (habitual)

In sum, a High tone marks the penultimate syllable of each post-verbal element, but not the verb that precedes them.

2.2. *Analysis: matrix clauses*

Taken together, the distribution of H tones in the examples from 1-, 2-, and 3-place predicates, as well as clauses with adverbial and locative modifiers, indicate substantial overlap between prosodic and syntactic structure in Rutooro. In all of the examples we have seen so far, nominal phrases, locative phrases, and adverbial phrases bear a penult High tone. In contrast, the verb is not marked with a High tone unless it lies at the right edge of the syntactic phrase it heads, as in intransitive clauses (11) or clauses with a pro-dropped object (12).

The structure in (18) shows the correspondence between the right edges of φ-phrases and the right edges of maximal projections in a transitive clause. The right edge of every XP is marked with a right parenthesis showing where its corresponding φ-phrase boundary is located. In cases where multiple edges align, one right parenthesis is shown in bold to to indicate that multiple syntactic edges are cued with a single φ-phrase boundary marker. Prosodic boundaries that align with multiple syntactic edges are not stronger than other boundaries, i.e. boundaries do not have a noticeably higher pitch or greater amplitude when they corresponds to multiple XPs as compared to a single XP.

(18)   H tone assignment in transitive clause
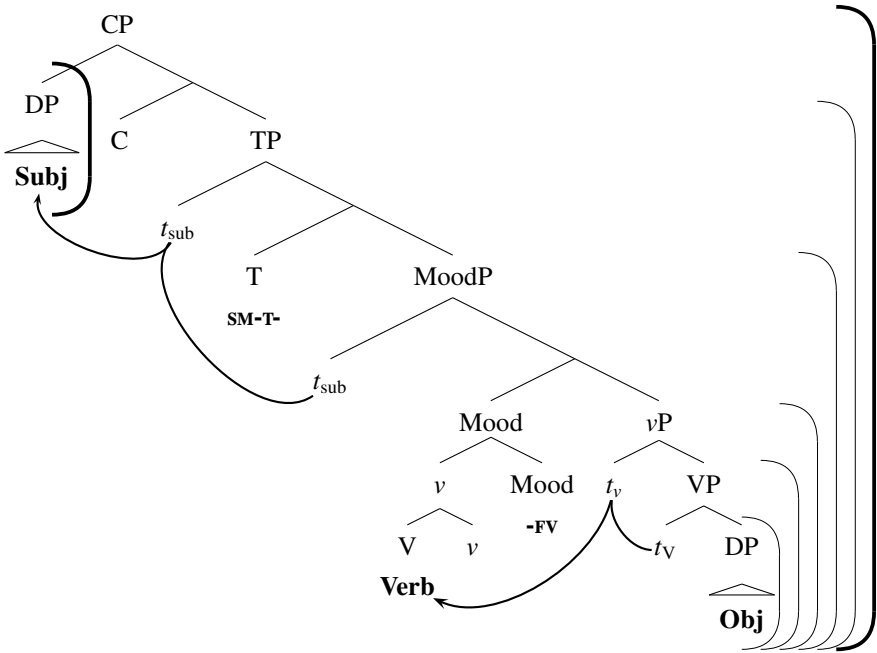
In (18), the verb root undergoes a series of head movements into MoodP, which hosts the final vowel (FV) and introduces the external argument (see e.g. Buell 2005, Cheng & Downing 2012, Halpert 2015, Julien 2002, Zentz 2016). The external argument, in turn, moves to the topic position in matrix clauses, shown as the specifier of CP (see e.g. Bresnan & Mchombo 1987, Cheng & Downing 2009, Downing & Hyman 2015, Henderson 2006, 2007, Lesholo 2002, Zentz 2016).

In sum, we have made the case for a reliable association between maximal projections and φ-phrases in Rutooro's matrix clauses. Subsequently, the location of the H tone can be taken to indicate not only the right edges of phonological phrases, but also the right edges of syntactic phrases. In the next section, we look at the distribution of High tones in noun phrases of varying complexity.

3. THE NOMINAL DOMAIN

Based on the distribution of H tones, as well as the order of constituents inside the nominal domain, Rutooro's nominal modifiers can be classified as belonging to one of two types. In the first, which we call TYPE 1 modifiers, the head noun is all-L and the modifying phrase is obligatorily postnominal. In the second, TYPE 2 modifiers, the head noun is marked with a H tone and the modifier can surface

either before or after the head noun.[4] We use the generalization from Section 2—that High tones serve as a diagnostic for φ-phrase boundaries, which in turn correspond to the edges of syntactic XPs—to develop a syntactic account that explains the fact that nominal heads belong to the same φ-phases as their modifiers in some cases, but not in others as well as the word order patterns. We begin by introducing the relevant data in Sections 3.1 and 3.2 below.

3.1. H-less nouns

The head noun does not bear a H tone when it combines with a Type 1 modifier, e.g. a possessor. Possessive constructions are head-initial in Rutooro, and the possessor, but not the possessum, bears a High tone. This generalization is illustrated in (19) with possessive pronouns and in (20) with full nominal possessors.

(19) (a) e-n-kaito   z-áánge)φ
          AUG-C10-shoes C10-1SG
          'my shoes'
    (b) e-by-ookulya by-áítu)φ
          AUG-C8-food C8-1PL
          'our food'

(20) (a) e-ki-nyonyi ky-a   Kajúúmba)φ
          AUG-C7-bird C7-LNK Kajumba
          'Kajumba's bird'
    (b) e-by-ookulya by-'   oo-mu-lími)φ
          AUG-C8-food C8-LNK AUG-C2-farmer
          'The farmer's food'

The same pattern occurs with numerals, as shown in (21), and the quantifiers 'another', 'many', and 'how many', as in (22):

(21) (a) e-bi-huguhugu bi-sátu)φ
          AUG-C8-bat   C8-three
          'three bats'
    (b) a-ba-ana   ba-tááno)φ
          AUG-C2-child C2-five
          'five children'

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[4] Kaji (2009) reports that the presence or absence of a H tone on a nominal head depends in part on the size of the modifier: the head noun is all low when it combines with a modifier that has a monosyllabic root e.g. (22-b) and (24-b), but bears a H tone when it combines with a larger modifier, e.g. (22-c) and (24-a). As should be clear based on our transcription, our speaker does not have this contrast.

(22) (a) e-bi-cuumbiro   bí-íngi)φ
        AUG-C8-kitchen C8-many
        'many kitchens'

    (b) e-ri-iba   líí-ndi)φ
        AUG-C5-dove C5-another
        'another dove'

    (c) e-bi-bira   bi-ingáha)φ
        AUG-C8-forest C8-how.many
        'how many forests'

The distribution of H tones in nominal phrases modified by adjectives follows the same principle: the adjective bears a H tone and follows the noun (23).

(23) (a) e-ki-tabu   ki-rúúngi)φ
        AUG-C7-book C7-good
        'the good book'

    (b) o-muu-ntu   mú-bi)φ
        AUG-C1-person C1-bad
        'the bad person'

The same adjectives introduced in (23) trigger a H tone on the noun they modify when they are marked with what appears to be an augment vowel, as shown in (24). Kaji (2009) discusses this type of structure in the context of the general association between the augment vowel and definiteness across the family (also mentioned in Section 1.1), and concludes that there is an association between definiteness and the distribution of Rutooro's H tone. Our data align with Kaji's; however, our analysis differs. We treat these structures as 'full' relative clauses (see Section 4), supported in part by the fact that our speaker offers relative clause translations of these and related examples. In line with this analysis, what Kaji (2009) glosses as the augment, we gloss as a relativizing prefix in (24).

(24) (a) e-ki-tábu   e-ki-rúúngi)φ
        AUG-C7-book REL-C7-good
        'the good book / the book that is good'

    (b) o-múú-ntu   o-mú-bi)φ
        AUG-C1-person REL-C1-bad
        'the bad person / the person who is bad'

    To summarize the emerging generalization, the head noun is all-L when it combines with a TYPE 1 modifier – possessors, numerals, certain quantifiers, and adjectives. TYPE 1 modifiers are postverbal and bear a H tone. Because we take H tones to mark the right edges of φ-phrases, we must conclude that the noun and the following TYPE 1 modifier are realized in a single φ-phrase.

    When multiple TYPE 1 modifiers follow the verb, they each have their own prominence:

(25) (a) a-ma-iba   a-sátu)φ gáá-ndi)φ
           AUG-C6-dove C6-three C6-another
           'another three doves'
      (b) a-ma-iba   gáá-ndi)φ a-sátu)φ
           AUG-C6-dove C6-another C6-three
           'another three doves'
      (c) e-bi-cuumbiro   by-áánge)φ bí-íngi)φ
           AUG-C8-kitchen C8-1SG   C8-many
           'many kitchens of mine'
      (d) *e-bi-cuumbiro bí-íngi)φ by-áánge)φ
           AUG-C8-kitchen C8-many C8-1SG
           Intended: many kitchens of mine

The order of TYPE 1 adnominals is generally quite free, as illustrated by (25-a) and
(25-b). One firm restriction, however, is that possessives must always immediately
follow the noun, as indicated by the contrast between (25-c) and (25-d).

3.2. H-marked nouns

The second pattern found in nominal phrases involves a head noun that is marked
H. This occurs when the noun is modified by a TYPE 2 modifier in either
prenominal or postnominal position. As shown in (26), the universal quantifier
can precede or follow the head noun. In either position, both the quantifier and
the noun it modifies are marked with a H tone.

(26) (a) e-bi-bíra)φ   by-óóna)φ
           AUG-C8-forest C8-all
           'all forests'
      (b) by-óón)φ ee-bi-bíra)φ
           C8-all   AUG-C8-forest
           'all forests'

The same pattern occurs with demonstratives, as shown in (27). Both the noun
and the TYPE 2 modifier comprise a unique φ-phrase.

(27) (a) e-ki-sumurúzo)φ kí-nu)φ
           AUG-C7-key   C7-this
           'this key'
      (b) kí-nu)φ e-ki-sumurúzo)φ
           C7-this AUG-C7-key
           'this key'

   We have shown that TYPE 1 and TYPE 2 modifiers differ on two dimensions:
phonological phrasing and constituent order. They can be distinguished on the
basis of a third difference as well: TYPE 1 modifiers are permitted in existential

constructions, while TYPE 2 modifiers are not. This contrast is shown in (28).

(28) (a) Ha-roho   e-bi-tabu   bi-sátu   ha-mééza.
           C16.LOC-EXIST AUG-C8-book C8-three C16-table
           'There are three books on the table.'

      (b) Ha-roho   e-bi-tabu   bí-íngi   ha-mééza.
           C16.LOC-EXIST AUG-C8-book C8-many C16-table
           'There are many books on the table.'

      (c) Ha-roho   (*by-oona) e-bi-tabu   (*by-oona) ha-meeza.
           C16.LOC-EXIST C8-all   AUG-C8-book C8-all   C16-table
           Intended: There are all the books on the table.

      (d) Ha-roho   (*ki-nu) e-ki-tabu   (*ki-nu) ha-meeza.
           C16.LOC-EXIST C7-this AUG-C7-book C7-this C16-table
           Intended: There is this book on the table.

Existentials require indefinite associates (Milsark 1974) and nominals that can occur in existential sentences are traditionally categorized as 'weak' (See also Milsark 1977; Keenan 1987, 2003; Freeze 1992). In contrast, DPs that are excluded from co-occuring from existenials are categorized as 'strong.' Restrictions of this kind are referred to as definiteness effects (DE), which for Rutooro arise when TYPE 2 nominals combine with the existential *haroho*, as shown in (28-c) and (28-d) above. So, another way to categorize TYPE 1 and 2 nominals in Rutooro would be to call them 'weak' and 'strong', respectively.

We leave to future work to determine whether the definiteness effect in Rutooro existentials is fundamentally semantic, as is the prevailing approach to the phenomenon, or if instead, the differing syntactic behavior of Rutooro's weak and strong nominals might indicate that the definiteness effect is a morphosyntactic phenomenon, as proposed by Preminger (2014:221-227).

3.3. Analysis: nominal domain

At this point we have seen two patterns with respect to the distribution of High tones in noun phrases. In the first, the head noun is all-L when it is followed by a TYPE 1 modifier. In other words, the first TYPE 1 modifier is phrased with the head noun. Every subsequent one bears its own H tone, i.e. it is realized in its own φ-phrase.

In the second pattern, the head noun bears a H tone when it is followed by a TYPE 2 modifier. TYPE 2 adnominals can precede or follow the head noun, but either way, they phrase separately from it. Multiple TYPE 2 modifiers can precede or follow the head noun) and they can also flank the head noun. In all cases, TYPE 2 modifiers bear a H tone. These possibilities are schematized in (29) and (30).

(29) Type 1 adnominals

    (a) **Noun** type 1)φ

    (b) **Noun** type 1)φ type 1)φ

(30) Type 2 adnominals

    (a) type 2)φ type 2)φ **Noun**)φ

    (b) **Noun**)φ type 2)φ type 2)φ

    (c) type 2)φ **Noun**)φ type 2)φ

We apply the conclusion drawn in Section 2 to the distribution of H tones in nominal phrases. High tones serve as a diagnostic for φ-phrase boundaries, which in turn correspond to the edges of syntactic XPs. Thus, H tones reveal the underlying syntactic structure.

    We analyze Type 1 modifiers, which phrase with the head noun, as generated below the position where the head noun is pronounced. The result, schematized in (31) below, is that there is no XP boundary between the head noun and the first Type 1 modifier that follows, i.e. the numeral in the tree below, and the head noun is realized without a High boundary tone.

    In contrast, Type 2 modifiers are adjoined above the position where head noun is pronounced. Subsequently, an XP boundary follows the Type 2 modifier and precedes the head noun.

(31) High tone assignment in DPs
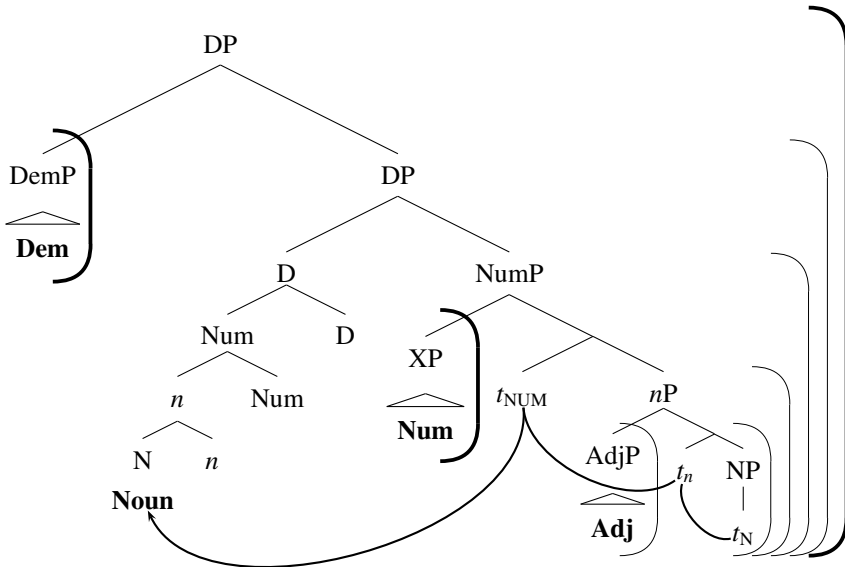
    The adjunction analysis also captures the fact that Type 2 adnominals surface on either side of the head noun; the tree in (32) illustrates a right-adjoined DemP.

(32)   Right-adjoined DemP
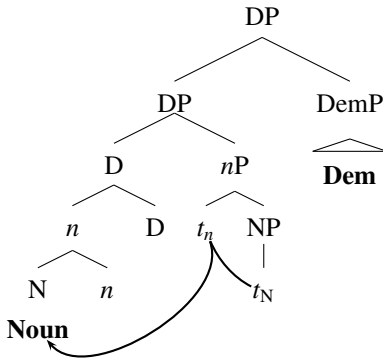
The structures in (31) and (32) are compatible with both the clausal structure given in (18) and—to a large extent—Carsten's (2000, 2008) account of the Bantu DP. The head noun is shown undergoing a series of head movements through a number of null heads into the determiner phrase. Type 1 modifiers are generated between the base and surface position of the noun. Type 2 modifiers, e.g. demonstrative phrases, are adjoined above the complex noun head to the left or to the right. When the demonstrative is left-adjoined, it is realized in a phrase-initial position; when it is right-adjoined, it is realized in a phrase-final position.

Until now, we have only seen noun phrases with either Type 1 or Type 2 modifiers. Of course, it is possible to combine the two, and when that happens, the distribution of H tones as well as the possible word orders falls out from the analysis presented here.

As schematized in (33), when Type 1 or Type 2 adnominals are combined, we find that there is always be a phonological phrase boundary between adjacent adnominals. Type 1 adnominals must follow the head noun, and Type 2 adnominals occur on the periphery of the noun phrase. Type 2 adnominals cannot intervene between the head noun and a Type 1 adnominal, as in (33-c) or between two Type 1 adnominals, as in (33-d).

(33)   Type 1 and Type 2 combined

    (a)   TYPE 2)φ **Noun** TYPE 1)φ TYPE 1)φ
    (b)   **Noun** TYPE 1)φ TYPE 1)φ TYPE 2)φ
    (c) *__Noun__)φ TYPE 2)φ TYPE 1)φ TYPE 1)φ
    (d) *__Noun__ TYPE 1)φ TYPE 2)φ TYPE 1)φ

In example (34), the Type 2 determiner *bínu* 'that' is shown in three different positions. Note that if it surfaces between *bisátu* 'three' and *bishááka* 'new' the sentence is still grammatical but its meaning has changed to 'these three books are new.'

(34)   (a)   (bí-nu)   e-bi-tabu   bi-sátu   (#bí-nu)   bi-shááka   (bí-nu)
             C8-this   AUG-C8-book   C8-three   C8-this   C8-new   C8-this
             'these three new books'

We bring this section to a close with an observation about parallelism in the nominal and clausal domains with respect to prosodic phrasing: TYPE 1 modifiers behave like clausal objects and TYPE 2 modifiers behave like clausal subjects. In both cases, we can capture the prosodic phrasing via low and high attachment with respect to the post-movement landing site of the relevant head.

The distribution of H in TYPE 1 noun phrases, where the head noun does not bear a H tone, resembles the distribution of H in verb phrases with internal arguments and low adjuncts. Like internal arguments and low adjuncts, TYPE 1 modifiers are postnominal, and the first one phrases with the noun. Therefore, TYPE 1 modifiers must be located inside of the XP in which the nominal head is pronounced, so that the head noun is not pronounced at the right edge of an XP.

The distribution of H tones in nominal phrases with multiple TYPE 1 adnominals is also reminiscent of verb phrases with multiple postverbal arguments and low adjuncts, as discussed in Section 2: the head of the phrase does not bear a H tone, but every subconstituent that follows the head does. In contrast, TYPE 2 noun phrases, pattern like clausal subjects. When subjects appear in their canonical preverbal position, they surface with a H tone. Subjects can also be post-posed, and when they surface in a post-verbal position, they still do not phrase with the verb. An example of a post-posed subject is shown in (35).[5]

(35)   A-ka-yáámb-a   Kajúúmba.
       3SG-PST-help-FV   Kajumba.
       'Kajumba helped.'

Similarly, TYPE 2 adnominals can surface before or after the noun, as was shown in Section 3.2. In either position, TYPE 2 adnominals do not phrase with the head noun. As was argued for sentential subjects, TYPE 2 adnominals must be located above the position where the nominal head is pronounced to ensure that the head noun is pronounced at the right edge of an XP, whether or not it surfaces in a pre- or postnominal position.

The parallels between the distribution of H tones and the syntactic configuration is schematized in (36):

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[5] Without the High on the verb, the phrase would mean 'He/she helped Kajumba'.

(36) Summary of clausal-nominal connection

a.	Low attachment			**verb**	OBJECT	)φ
				noun	TYPE 1	)φ
b.	High attachment	{SUBJECT}	)φ	**verb**	)φ	{SUBJECT}	)φ
		{TYPE 2}	)φ	**noun**	)φ	{TYPE 2}	)φ

The syntactic connection between the clausal and nominal domains can be summarized as follows. Objects and TYPE 1 adnominals attach lower than the final landing site of the relevant head and subjects and TYPE 2 adnominals attach higher than the final landing site of the relevant head. The next section applies the connection between H tone distribution and relative attachment site to the domain of relative clauses.

4. RELATIVE CLAUSES

Rutooro exhibits two types of relative clauses, which we refer to as 'full' and 'reduced'. While Zulu famously has two distinct relative clause constructions (e.g. Cheng and Downing 2007, Cheng and Downing 2010, Henderson 2007, Zeller 2004), Rutooro is somewhat unique among its closest relatives for utilizing two different relativization strategies. Whereas the closely related languages Rutooro, Luganda, Rukiga, Haya and Runyambo (e.g. Allen 2004; Duranti 1997; Henderson 2007; Hyman and Katamba 2004; Pak 2007; Zeller 2004), exhibit full RCs that agree with the relativized head, even in non-subject RCs, only Rutooro has a second relativization strategy that lacks head agreement, i.e. the reduced relative clause. Based on the morphosyntactic differences between full and reduced relative clauses, we propose that full relative clause have more syntactic structure associated with them than their corresponding reduced forms.

Restrictive and nonrestrictive readings are possible with full relative clauses, whereas only the restrictive reading is available in the case of reduced relative clauses. Perhaps the more interesting difference between full and reduced relative clauses, however, pertains to the distribution of H tones. The relative clause head bears a H tone when it is modified by a full relative clause, but not when it is modified by a reduced relative clause. Example (37) compares a reduced subject RC, a full subject RC, and a matrix clause in the habitual aspect. Note that *abaantu* 'people' is not marked with a H tone in the reduced subject RC (37-a), which is the only difference between the reduced RC and the matrix clause (37-c). Meanwhile *abaantu* 'people' does bear a high tone in the full subject RC (37-b), leaving the relativizer *a-* on the verb *abasoma* 'read' to distinguish between the full subject RC and the matrix clause.

(37) (a) a-baa-ntu   [_RC ba-sóm-a])φ
            AUG-C2-people   C2.SM-read-FV
            'people who read' (habitual)

   (b) a-báá-ntu)φ   [RC a-ba-sóm-a])φ
         AUG-C2-people   REL-C2.SM-read-FV
         'the people who read' (habitual)
   (c) A-báá-ntu)φ   ba-sóm-a.)φ
         AUG-C2-people C2.SM-read-FV
         'People read.' (habitual)

As in previous sections, we appeal to relative attachment height to explain whether or not the phrase head lies at the right edge of a φ-phrase boundary.

4.1. Full relative clauses

Rutooro's full relative clauses are of Type 1 according to Henderson's (2006, 2007) classification of Bantu relatives, because they show agreement with both the subject and the relativized head in non-subject RCs. RCs in the languages most closely related to Rutooro are of the same basic type; however, there are interesting differences, especially with respect to the location of non-subject RC head agreement markers.

In Rukiga (Allen 2014), the RC head agreement marker is separated from the verb stem by the lexical subject, while for Luganda and Rutooro (see citations above for Luganda), the non-subject RC head agreement appears on the stem (as shown in the Rutooro examples below). In Haya (Duranti 1997) and Runyambo (Josephat Rugemalira p.c.), the relative clause head agreement marker can surface in either location: attached to the verb, as in Luganda and Rutooro, or attached to subject, as in Rukiga.

For Rutooro, full relative clauses begin with a relativizing prefix. In most cases, the relativizer has the same form as the augment morpheme found in nominals (see discussion in Section 1.1); however, unlike the augment, there are cases in which the relativizer does not harmonize with the following vowel. One such example is (38), in which the relativizer surfaces as *o-* [ow-] before the Class 1 subject marker *a-*.[6] In contrast, an augment would be expected to take the (phonologically harmonizing) form *a-* before a class marker containing /a/.

(38) úúw   [RC oow-a-raa-rór-a]
      3SG.INDEP   REL-C1.SM-FUT-see-FV
      'HE/SHE who will see'

Below we compare a matrix clause (39-a) to a full subject relative (39-b), a full direct object relative (39-c), and a full indirect object relative (39-d).

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[6] In this example, the relativizer undergoes compensatory lengthening and [w] is inserted to prevent hiatus (see 1.1 for more information on both of these phonological processes).

(39) (a) A-báá-ntu)φ   ba-som   ee-bi-tábu.)φ
           AUG-C2-person C2.SM-read AUG-C8-book
           'People read books.' (habitual)

      (b) a-báá-ntu)φ   [RC **a**-ba-som   ee-bi-tábu])φ
           AUG-C2-person   REL-C2.SM-read-FV AUG-C8-book
           'the people who read books' (habitual)

      (c) e-bi-tábu)φ   [RC a-báá-ntu)φ   **e-bi**-ba-sóm-a])φ
           AUG-C8-book   AUG-C2-person REL-C8-C2.SM-read-FV
           'the books that people read' (habitual)

      (d) a-bá-ána)φ   [RC a-báá-ntu   **a-ba**-ba-som-er
           AUG-C2-child   AUG-C2-person REL-C2-C2.SM-read-APPL
           ee-bi-tábu])φ
           AUG-C8-book
           'the children who the people read books to' (habitual)

The word order in full relative clauses is also the same as the word order in simple
matrix clauses, i.e. there is no subject-verb inversion as found in the relative
clauses of other Bantu languages. The subject precedes the verb, as in (39-c)
and (39-d), and the object follows the verb, as in (39-b) and (39-d). In each of
the examples in (39), the verb bears the subject's class marker (C2), which we
analyze as agreement between T and the subject.

    A second class marker—one which agrees with the relativized head—is
obligatorily represented on the predicate of the relative clause when something
other than the subject is relativized. In (39-c), the direct object (C8) is relativized,
and in (39-d), the indirect object (C2) is relativized. In both cases, the class marker
of the relativized head appears before the subject marker.

    We note here that there can be morphological differences between the verbs
in main clauses and their corresponding relative forms. In some cases a different
prefix or suffix is used. For instance the Far Past is marked by the prefix *ka-* and
Final Vowel *-a* in main clauses, while it is marked by the prefix *a-* and Final Vowel
ire- in relative clauses. While most TAM prefixes in main clause verbs follow
the Subject Marker, one, the progressive *ni-* seen in (3a) precedes the Subject
Marker. In relative forms, however, all TAM prefixes must follow the Subject
Marker (the progressive being expressed by *ku-*). This is also true of negation. It
is often expressed as a prefix before the Subject Marker in main clauses, but is
expressed after the Subject Marker in relative clauses. The difference is illustrated
below in (40).

(40) (a) A-báá-ntu)φ   **ti**-ba-ku-sóm-a)φ
           AUG-C2-people NEG-C2.SM-PROG-read-FV
           'The people are not reading.'

      (b) a-báá-ntu)φ   [RC a-ba-**ta**-ku-sóm-a])φ
           AUG-C2-people   REL-C2.SM-NEG-PROG-read-FV
           'the people who are not reading'

A template for the verbal morphology of full relative clauses is shown in (41). We analyze agreement with the relative head (CM.ʜᴇᴀᴅ) as taking place at C, which we find exclusively in nonsubject relative clauses. A stated above, subject agreement (CM.sᴜʙᴊ) is obligatory in all relative clauses and takes place at T.

(41)   **Full RCs**: ʀᴇʟ-CM.ʜᴇᴀᴅ-CM.sᴜʙᴊ-ɴᴇɢ-T-Root-ꜰᴠ

In Section 2.2, we claimed that subjects in canonical SVO clauses are located in a topic position in the periphery of the clause. We take the lack of agreement on C in matrix clauses to represent a difference between the C of matrix vs. relative clauses with respect to feature sensitivity: only C[ʀᴇʟ] is an agreeing head.[7] Still, we might expect subject agreement to occur twice—once at T and once at C—in subject relative clauses; and yet, we never find double subject agreement.

Example (42-a) shows that the subject's class marker cannot be expressed twice on the verb. The ungrammaticality of (42-a) cannot be phonologically motivated, nor can it represent morphological dissimilation, e.g. Nevins' (2007) account of "spurious *se* (Perlmutter 1968)" in Spanish, because while examples like (42-a) are ungrammatical, examples like (42-b) do occur. In (42-b), the object's class marker and the subject's class marker are both C2 and yet they surface on adjacent heads causing the syllable *ba-* to be repeated.

(42)   (a)   a-ba-límí   [ᴿᶜ a-(***ba**)-**ba**-gonz-a   a-bá-ána
              ᴀᴜɢ-C2-farmers   ʀᴇʟ-C2-C2.sᴍ-love-ꜰᴠ ᴀᴜɢ-C2-children
              'the farmers who love the children' (habitual)
       (b)   a-ba-límí   a-bá-ána   [ᴿᶜ a-**ba**-**ba**-gónz-a
              ᴀᴜɢ-C2-farmers ᴀᴜɢ-C2-children   ʀᴇʟ-C2-C2.sᴍ-love-ꜰᴠ
              'the farmers who the children love' (habitual)

In order to account for the ungrammaticality of (42-a), we appeal to the Activity Condition (Chomsky 2000, 2001), which restricts Agree to goals that have not yet already been targeted by Agree operations. Although the Activity Condition typically applies to Case features, we take inspiration from Oxford (2017) and sources cited therein for proposing that noun class is the feature that is sensitive to the Activity Condition in Rutooro. We propose that noun class agreement on C cannot target the goal of T-agreement, and subsequently, the subject cannot agree with both T and C.

As mentioned briefly in the beginning of this section, in both object and subject relative clauses, the head is marked with a H tone. Within the relative clause itself, the distribution of H tones is the same as it is in root clauses: the subject is marked with a H tone, as in (39-c), the object is marked with a H tone, as in (39-b), and by comparing (39-b) and (39-c), we see that the verb is only marked with a H tone if it is not followed by an argument (or adjunct). The presence of a

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[7] See Pietraszko (2019) for a DP-shell analysis of relative clauses in Ndebele, another Bantu language with a connection between relativizing prefixes and augment vowels.

H tone indicates a φ-phrase boundary, so the heads of full relative clauses are at the right-edge of a φ-phrase, which in turn corresponds to the right-edge of an XP. As mentioned previously, Luganda's RCs are morphologically similar to full RCs in Rutooro; however, an important difference is that the RC head forms a prosodic unit with the RC in Luganda (Hyman and Katamba 2004; Pak 2007), but not in Rutooro (cf. Rutooro's reduced relative clauses discussed in 4.2).

   We account for the prosodic phrasing of full RCs in the same way we accounted for Type 2 modifiers (see Section 3.3): we appeal to the relative height of the attachment site. In other words, the relative clause is attached above the XP in which the relativized nominal is pronounced. We adopt a head-external account of RC formation (Partee 1975; Chomsky 1977; Jackendoff 1977) illustrated in (43). We maintain that the relativized head originates in an RC-external position and is co-indexed with a null element internal to the relative clause; in other words, the external and internal relative clause heads are not part of a movement chain. Neither full relative clauses nor reduced relative clauses (see next section) display any evidence of movement (cf. Pak 2007 for Luganda).

(43)   High tone assignment in full RCs
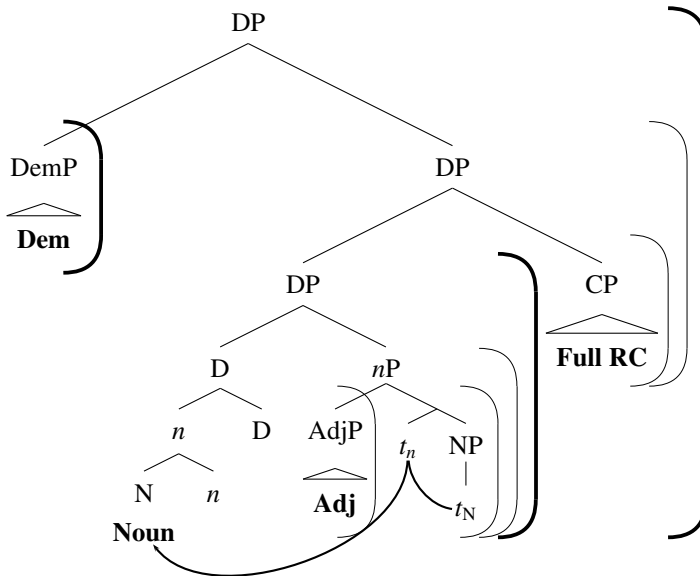
   Raising-based analyses (Schachter 1973; Kayne 1994; Bianchi 2000; Bhatt 2002) are incompatible with head-movement in the DP domain. According to a raising account, the relativized head originates inside the Relative Clause CP in the position associated with its θ-role. The final position of the head varies according to the specific analysis (e.g. compare Kayne 1994 and Bhatt 2002), but the principle remains that the RC head, an NP, undergoes phrasal movement. Assuming moved constituents are islands to extraction (e.g. Wexler

and Culicover's 1980 Freezing Principle), once the head of the relative clause is extracted (an NP), the head of that NP (an N) is inaccessible to further movement.

Furthermore, the head-external analysis shown above easily explains why TYPE 2 modifiers, e.g. demonstratives, can precede the relativized nominal, precede the relative clause, or follow the relative clause. In (51), the three possible positions for realization of the demonstrative *bánu* are indicated numerically.

(44) (**bánu**$_1$)φ a-baa-ntu   ba-rúúngi)φ (**bánu**$_2$)φ [$_{RC}$ a-ba-sóm-a])φ
      C2-this   AUG-C2-people C2-good   C2-this   REL-C2.SM-read-FV
      (**bánu**$_3$)φ
      C2-this

      'these good people who read' (habitual)

The head-external analysis allows for alternate orders by varying the direction and location of DemP attachment. The tree in (45) schematizes two of the possible positions for *bánu* 'C2-this' in (51), corresponding to *bánu*$_2$ and *bánu*$_3$. Rotating either of these branches yields a pre-RC-head demonstrative (*bánu*$_1$).

(45)   Variable position of demonstratives in association with full RCs
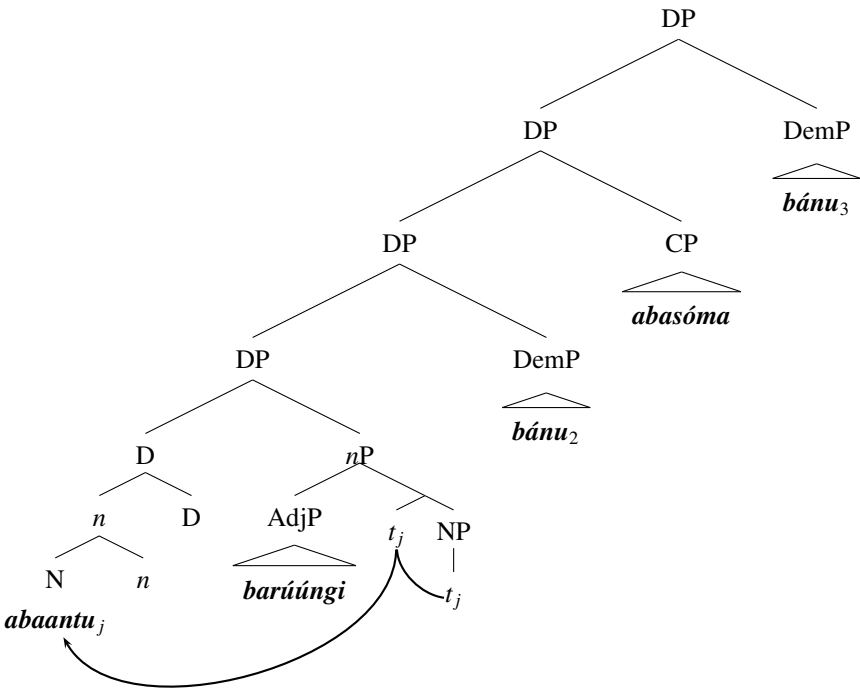
4.2. *Reduced relative clauses*

Rutooro's second relative clause type—the 'reduced' relative clause—falls into Type 2 in Henderson's (2006, 2007) typology for the reason that it exhibits subject agreement, but no agreement with non-subject RC heads. From the perspective of the relativization strategies employed by Rutooro's closest relatives, the reduced RC is more divergent than the full RC. Reduced RCs behave similarly to full RCs with respect to word order and the use of the low negation marker; however, this construction differs with respect to preverbal morphology and H tone distribution. Unlike in full RCs, reduced RCs do not appear with a relativizing prefix. Compare the reduced subject RC in (46-a) to the full subject RC in (46-b). For reasons that will become clear in Section 5, prosodic constituency and H tones are left unmarked in some examples.

(46) (a) a-baa-ntu [RC ba-som ee-bi-tabu]
AUG-C2-people C2.SM-read AUG-C8-book
'the people who read books' (habitual)

(b) a-baa-ntu [RC **a**-ba-som ee-bi-tabu]
AUG-C2-people REL-C2.SM-read AUG-C8-book
'the people who read books' (habitual)

As discussed in the previous section, in Rutooro's full relative clauses, subject and non-subject relatives differ with respect to the number of class markers on the verb. The subject marker is always present, but in non-subject RCs, a second class marker appears that agrees with the relativized nominal. To see this difference compare (46-b) to (47-b). In contrast, the form of the verb in subject as compared to non-subject relative clauses is invariable in reduced relative clauses. Compare the class marker on the reduced subject relative in (46-a) to the reduced object relative in (47-a). In both cases, the verb only agrees with the subject.

(47) (a) e-bi-tabu [RC a-baa-ntu ba-som-a]
AUG-C8-book AUG-C2-people C2.SM-read-FV
'the books that people read' (habitual)

(b) e-bi-tabu [RC a-baa-ntu **e-bi**-ba-som-a]
AUG-C8-book AUG-C2-people REL-C8-C2.SM-read-FV
'the books that people read' (habitual)

A template summarizing the verbal morphology of reduced subject and object relative clauses is provided in (48):

(48) **Reduced RCs**: CM.SUBJ-NEG-T-Root-FV

At this point, having only considered the morphosyntactic differences between full and reduced relatives, it might appear that the contrast between full vs. reduced RCs amounts to a difference between overt vs. null C. However, there is reason to believe that the absence of the relativizing prefix indicates an absence

of CP structure as opposed to simply phonological material, and subsequently, we propose that reduced relative clauses only project only as high as TP.

In addition to lacking the relativizing prefix and class agreement with the relativized nominal, reduced relative clauses behave differently than both full relative clauses and matrix clauses with respect to the placement of high adverbs. High adverbs cannot precede the verb in reduced object relatives with overt subjects, as shown in (49-c) below. In contrast, the same adverb can surface in exactly the position disallowed in reduced relatives in matrix clauses and in full object relatives, as shown in (49-a) and (69-c), respectively.

(49) (a) A-báá-ntu)φ   **ííjo**)φ   ba-ka-som   ee-bi-tábu.)φ
           AUG-C2-people yesterday C2.SM-PST-read AUG-C8-book
           'the people read books yesterday.' (far past)

      (b) e-bi-tábu)φ   [RC a-báá-ntu)φ   **ííjo**)φ
           AUG-C8-book   AUG-C2-people yesterday
           e-bi-ba-a-som-ére])φ
           REL-C8.OM-C2.SM-PST-read-FV
           'the books that the people read yesterday.' (far past)

      (c) e-bi-tábu)φ   [RC a-báá-ntu)φ   (***ííjo**))φ ba-a-som-ére])φ
           AUG-C8-book   AUG-C2-people yesterday C2.SM-PST-read-FV
           Intended: the books the people read yesterday. (far past)

In matrix clauses and full relatives, where preverbal subjects are topics located in CP, an adverb can adjoin at TP and surface between the topic and the verb, e.g. *ííjo* 'yesterday' (49-a). In contrast, in reduced object relative clauses adjoining to TP results in the adverb preceding the subject or following the verb.

Supported in part by the behavior of adverbs such as *ííjo* 'yesterday', we suggest that the subject sits in the specifier of CP in full object relatives, whereas it sits in the specifier of TP in reduced object relatives. Together, the morphological form of reduced RCs and the behavior of high adverbs in reduced RCs suggest that this type of relative clause only projects as high as TP.

Next, we account for the prosodic phrasing of reduced relatives. The heads of reduced RCs surface as all-L, so they must not surface at the right-edge of a prosodic boundary. As before, we appeal to the relative height of attachment to account for the distribution of H. Like nominal heads modified by demonstratives and other weak determiners (see 3.3), the heads of reduced RCs are attached internally to the XP in which the RC head is pronounced, as shown in (50).

(50)   High tone assignment in reduced RCs
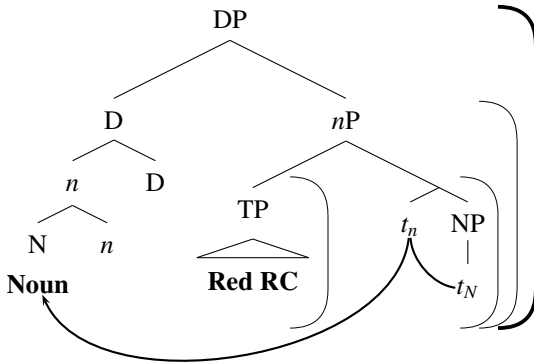
   This analysis also captures the fact that our speaker disprefers high deter-
miners preceding the relative clause in reduced RCs (51), whereas they are fully
grammatical in this position in full RCs (44).

(51)   (**bá-nu**$_1$)φ a-baa-ntu   (**?bá-nu**$_2$)φ [$_{RC}$ ba-sóm-a])φ (**bá-nu**$_3$)φ
       C2-this   AUG-C2-people C2-this   C2.SM-read-FV   C2-this
       'those people who read' (habitual)

The structure in (52) schematizes one of the possible positions for *bánu* 'C2-this'
in (51), corresponding to *bánu*$_3$. Rotating this branch would yield *bánu*$_1$, e.g. a
demonstrative that surfaces before the relativized head.

(52)   Variable position of demonstratives in association with reduced RC
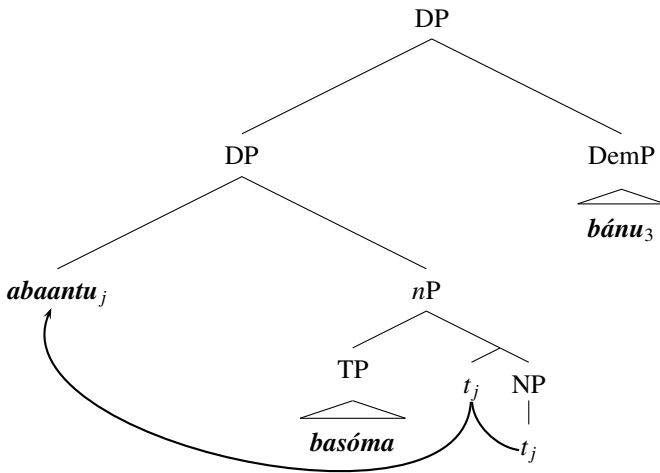
   The difference between full and reduced RCs with respect to the location

of the demonstrative *bánu* is the consequence of how full vs. reduced relative clauses attach to the relativized nominal. The demonstrative only ever adjoins to the DP, but in the case of full relative clauses, which also adjoin to DP, *bánu* can attach above or below the RC. For reduced relatives, which attach internally to the relativized head, *bánu* is necessarily adjoined above the position of the RC, and consequently it cannot surface between the relativized head and the reduced RC.

At this point, we have sketched a head-external analysis of full CP relative clauses and reduced TP relative clauses in Rutooro that accounts for the presence of a H-tone boundary on nouns modified by full RCs and the absence of a H-tone boundary on nouns modified by reduced RCs. The explanation relies on two different attachment sites for relative clauses: full relative clauses attach outside of the relativized nominal's DP, while reduced relative clauses attach in a DP-internal position. It remains an open question as to why CP- and TP-modifiers attach in these two locations; however, this difference in attachment site and H tone distribution is found across adnominal phrases in Rutooro. Indeed, the connection between H tones and phrase-internal vs. external positions relative to a particular phrase head extends more broadly across the language: internal arguments pattern with Type 1 modifiers and reduced relative clauses, while external arguments pattern with Type 2 modifiers and full relative clauses. As such, the analysis finds broad support in a variety of constructions in the language. However, a subset of reduced relative clauses, discussed in the next section, challenges the perfect association between φ-phrases and syntactic XPs.

5. Prosodic analysis

In Section 1, we offered a simple H tone insertion rule for Rutooro, which is repeated in (53) and illustrated in (54):

(53)   High Tone Insertion Rule: Insert a High tone and link it to the penultimate syllable of every φ-phrase.

(54)   High Tone Insertion

$$\emptyset \quad \rightarrow \quad \overset{\sigma \quad \sigma)\varphi}{\underset{\text{H}}{\shortmid}}$$

Before H tones can be inserted, however, the prosodic component of the grammar must convert syntactic XPs into phonological φ-phrases. The data we have gathered to this point do not allow us to distinguish between competing theoretical approaches on empirical grounds. We offer a Match-theoretic account (Selkirk 2011, Elfner 2012, 2015, Itô & Mester 2013), but note that alternative approaches, e.g. an Edge-Based account (Selkirk 1986, 1995, 2000, Truckenbrodt 1995, 1999, 2007), would be equally able to handle these data.

Match theory takes as its jumping off point the idea that syntactic and prosodic constituents correspond. Further explanation of the basic tenets of Match Theory

as well as a contextualization of the theory in the broader syntax-prosody literature can be found in Bennett and Elfner 2017 and Elfner 2018. Examples of research offering MATCH-theoretic accounts of a variety of puzzles at the syntax-prosody interface include the papers cited above as well as Bennett et al. 2015, 2016, to appear, Clemens 2014a, to appear, Myrberg 2013, and Tyler to appear.

Individual MATCH constraints make specific predictions about how syntactic units map onto prosodic units, as summarized by (55):

(55)   Schematization of MATCH Constraints (Based on Selkirk 2011)
   (a)   Syntactic head (X^0) ⟷ Prosodic word (ω)
   (b)   Syntactic phrase (XP) ⟷ Phonological phrase (φ)
   (c)   Illocutionary phrase (CP/IP) ⟷ Intonational phrase (ι)

For all of the data presented thus far—matrix clauses, nominals, and relative clauses—only one MATCH constraint (56) is needed to capture the distribution of H tones in Rutooro:

(56)   MATCH PHRASE: XPs correspond to φ-phrases.

By way of example, we consider the syntax-prosody mapping of a transitive clause modified by an adverb, first introduced as (17), repeated in (57):

(57)   A-báá-ntu)φ ba-som   ee-bi-tábu)φ ku-rúúngi)φ
       AUG-C2-person 3PL.SM-read AUG-C8-book C17-well
   'The people read the books well.' (habitual)

   A syntactic tree for this specific example is shown in (58):

(58)   Syntactic tree: transitive clause with adverbial modifier
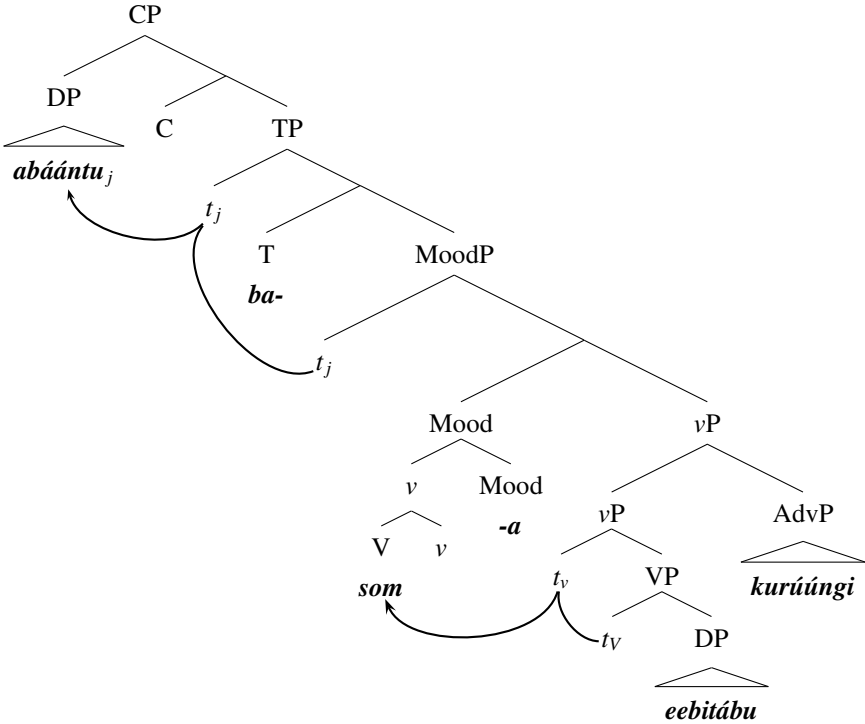
The structure in (58) is the input to the prosodic component of the grammar; however, we assume the tree in (58) is pruned in a number of ways discussed at length in Elfner 2012 (see also Clemens 2019). First, XPs embedded in unary-branching XPs are deleted (this is sometimes referred to as 'no redundant recursive structure'). Second, terminal nodes that do not correspond to phonologically overt material are not assigned prosodic structure. Finally, the X'-node does not have an associated prosodic category, so tertiary prosodic branching is the predicted outcome when the specifier of a phrase contains phonologically overt material. The syntactic tree in (58) is translated into a prosodic structure in (59):

(59)   Prosodic tree: transitive clause with adverbial modifier

ι

φ   φ

ω   ω   φ

abáántu   **basoma**   φ   φ

ω   ω

ebitábu   **kurúúngi**
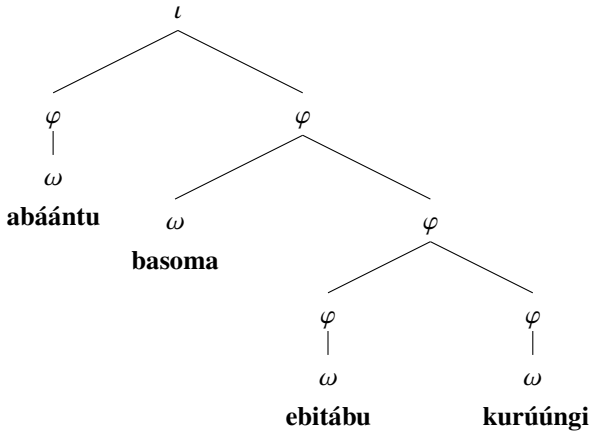
In the tableau in (60), the output candidates illustrate alternate ways in which the syntax might be assigned prosodic structure. The candidate with the prosodic structure shown in (59)—Candidate (a)—is also the candidate with the structure more isomorphic to (58).

(60)   Assigning prosodic structure to (58)

Input:	Match
[CP[DPabaantu][TP[MoodPbasoma[vP[VP[DPebitabu]][AdvPkuruungi]]]]]	Phrase
a. ☞ abáántu)φ basoma ebitábu)φ kurúúngi)φ	
b. abáántu)φ basoma ebitabu kurúúngi)φ	*!
c. abáántu)φ basóma)φ ebitábu)φ kurúúngi)φ	*!

Candidate (a) is the winning candidate, because it faithfully maps all φ-phrases onto syntactic XPs. Candidate (b) incurs a violation of Match Phrase, because there is a syntactic XP in the input—associated with the direct object—that does not map onto a φ-phrase in the output. Candidate (c) incurs a violation of Match Phrase, because the phonological phrase boundary on the verb represents a φ-phrase in the output that does not map onto a syntactic XP in the input.

The entirety of the data presented thus far can be accounted for in this manner; however, we find two types of exceptions. First, we find the addition of a H tone on a prosodic-ω that is not on the right edge of a syntactic XP. Second, we find the suppression of a φ-boundary on a prosodic-ω aligning with the right edge of a syntactic XP. Both of these exceptions take place in the context of reduced relative clauses and will be discussed in turn.

5.1. *Reduced relative clauses with modified heads*

When a noun is modified by both a Type 1 modifier as well as a reduced relative clause and the Type 1 modifier precedes the reduced RC, the Type 1 modifier is realized all-L. This is shown in (61) where the adjective *baruungi* 'good' is realized without a H tone.

(61) a-ba-ana   ba-ruungi [$_{RC}$ ba-sóm-a])φ
     AUG-C2-child C2-good   C2.SM-read-FV
     'good children who read' (habitual)

We wrongly predict *baruungi* 'good' in (61) to be realized with a H tone based on the observation that in cases where a DP has more than one internal modifiers, each modifier typically *does* bear a H tone, cf. (62).

(62) a-ma-iba   ma-rúúngi)φ a-sátu)φ
     AUG-C6-dove C6-good   C6-three
     'three good doves'

Furthermore, the syntactic structure that we proposed for the Rutooro DP in Section 4.2 also predicts that *baruungi* 'good' in (61) would be realized with a H tone for the reason that it sits at the right edge of an XP. The adjectival phrase corresponding to *baruungi* 'good', where we expect *barúúngi* with a H on the penultimate syllable, is boxed in (63).

(63)   High tone assignment in a reduced RC with a modified head (61)
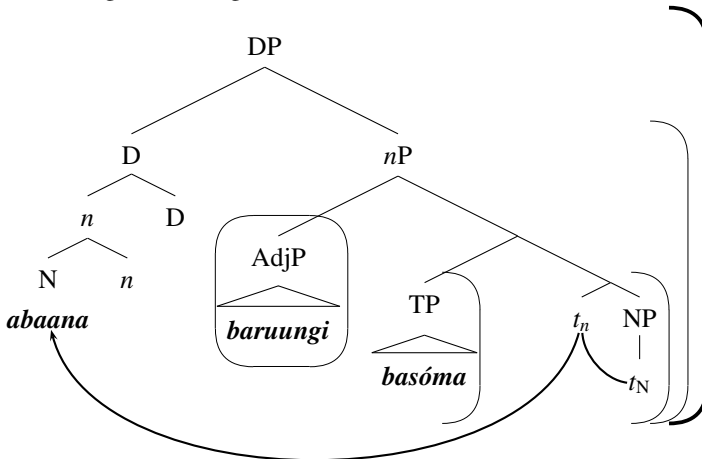
To account for the pattern found in reduced relative clauses with modified heads, we propose the constraint shown in (64):

(64)   ∗) Red Rel: Assign a penalty to the right edge of a φ-phrase before the reduced relative clause stem.

In short, the constraint ∗) RED REL penalizes structures for which a prosodic boundary precedes the stem of a reduced relative clause. The constraint refers to linear adjacency, because it is active in examples such as (61), when the element with a suppressed H tone is external to the relative clause, as well as when the element with a suppressed H tone is a clausemate of the RC's stem. This type of example will be shown in Section 5.2, when we discuss the case of reduced object RCs with overt subjects. In the meantime, (65) shows how ∗) RED REL is added into the prosodic analysis in order to cover the type of example shown in (61).

(65)   Assigning prosodic structure to (61):

Input: [DPabaana[nP[AdjPburuungi][TP basoma]]]]	∗) RED REL	MATCH PHRASE
a. abaana burúúngi)φ basóma)φ	∗!	
b. ☞ abaana buruungi basóma)φ		∗

The syntactic analysis of Rutooro's DP structure together with MATCH PHRASE makes the correct predictions for the simple reduced relative clauses, i.e. there is no H tone following the relativized head. Note that—at least for this example—the constraint ∗) RED REL also makes the correct prediction on its own. Thus, there is a certain amount of redundancy in the analysis, and perhaps the concern that ∗) RED REL weakens the case for a syntactic analysis that is largely isomorphic with the prosodic facts.

When the head of a reduced RC is modified, and—crucially—the RC immediately follows the head, the predicted prosodic structure obtains, i.e. the prosodic structure predicted by the syntactic analysis and MATCH PHRASE. This is shown in (66):

(66)   a-ba-ana   [RC ba-sóm-a   ])φ bá-nu)φ
       AUG-C2-child   C2.SM-read-FV   C2-this
       'these children who read' (habitual)

For examples like (66), the basic mapping constraint and the highly specialized prosodic constraint are doing double duty, which is illustrated in (67)

(67)   Assigning prosodic structure to (66):

Input: [DP[DPabaana[nP[TP basoma]]][DemPbanu]]	∗) RED REL	MATCH PHRASE
a. ☞ abaana basóma)φ bánu)φ		
b. abaana basoma bánu)φ		∗!
c. abáána)φ basóma)φ bánu)φ	∗!	∗

In (67), either ∗) RED REL or MATCH PHRASE is sufficient to rule out Candidate C, in which the relativized head is realized with a H tone. However, ∗) RED REL alone does not rule out Candidate B, which incurs a violation of MATCH PHRASE, because there is a syntactic XP in the input—associated with the RC—that does not map onto a φ-phrase in the output.

Thus, ∗) RED REL is a necessary component of the analysis, even though in a subset of cases it is somewhat redundant with MATCH PHRASE, which encapsulates the syntax-prosody mapping predictions. MATCH PHRASE is needed to account for the distribution of H in a wide range of scenarios including the one shown in (66), as well as any phrase that does not include a reduced RC, e.g. (60).

Next, we consider whether the syntactic analysis of reduced relative clauses should be streamlined with that of full relative clauses. Perhaps both types of relative clauses—full RCs that project as high as CP and reduced RCs that project as high as TP—are generated above the relativized head. Were this the case, the syntax-prosody mapping constraint MATCH PHRASE would predict a H tone to appear on the relativized head for both types of RCs, but in the case of reduced RCs, the higher ranked ∗) RED REL causes the syntax-prosody nonisomorphism.

While the syntactic analysis of reduced RCs—together with MATCH PHRASE— was primarily meant to explain the distribution of the H tones, it has other points in its favor as well. First, it offers an explanation as to what types of elements can intervene between the head and the reduced RC (see (51) and accompanying discussion). Second, it unifies the syntactic treatment of RCs with other adnominals, specifically Type 1 modifiers, by appealing to attachment height relative to the head. For those reasons, we decide against unifying the account of full and reduced relative clauses in Rutooro, with respect to the location of attachment.

Returning to the nature of ∗) RED REL, one lingering question is why the grammar would include such a specialized prosodic constraint. To speak to that concern, we return to an observation first made in Section 4.2: reduced RCs and matrix clauses are often string ambiguous. Consider example (68), which compares the attested phrasing of a reduced RC with a modified head, first introduced as (61) and repeated as (68-a), with its predicted phrasing (68-b), and a matrix clause with a modified subject (68-c):

(68) (a) a-ba-ana   ba-ruungi [$_{RC}$ ba-sóm-a])φ
           AUG-C2-child C2-good   C2.SM-read-FV
           'good children who read' (habitual)

      (b) ∗a-ba-ana   ba-rúúngi)φ [$_{RC}$ ba-sóm-a])φ
           AUG-C2-child C2-good   C2.SM-read-FV
           Intended: 'good children who read' (habitual)

      (c) A-ba-ana   ba-rúúngi)φ ba-sóm-a])φ
           AUG-C2-child C2-good   C2.SM-read-FV
           'Good children read.' (habitual)

Example (68-b) is ungrammatical with the H tone on *barúúngi* 'good'. We note that (68-b)—the prosodic realization that would be the most isomorphic with the underlying syntax—is entirely ambiguous with the matrix clause in (68-c). Thus, the syntactic account together with Match Phrase predicts that (68-b) should be grammatical, but it is only when ∗) Red Rel enters the picture that (68-a) can emerge as the winning candidate. Subsequently, no ambiguity arises.

When we consider the fact that disambiguation via prosodic means is a common strategy cross-linguistically, the constraint ∗) Red Rel, which prevents ambiguity, looks considerably less ad hoc. We view our account of this corner of Rutooro's syntax-prosody mapping as offering a formalization of a processing-cum-grammatical consideration. We consider ∗) Red Rel to be fully grammaticalized, because it represents actual prosodic realization and strong prosodic intuitions, not merely prosodic preferences, and because it is active even when the more isomorphic realization is not truly ambiguous with a matrix clause.

For example, in (69), the attested phrasing of a reduced object RC (69-a) is compared to the predicted phrasing without high-ranking ∗) Red Rel in (69-b). Note that in this example, (69-b) is not string ambiguous with a matrix clause interpretation (setting aside the improbability of discussing literate books), because in the matrix clause version (69-c), the class marker on the verb must agree with *ebitáabu* 'books'.

(69) (a) e-bi-tabu   [$_{RC}$ ba-som-ére])φ
           AUG-C8-book   C2.SM-read-FV
           'the books that (they) read' (near past)
      (b) ∗e-bi-tábu)φ [$_{RC}$ ba-som-ére])φ
           AUG-C8-book   C2.SM-read-FV
           Intended: 'the books that (they) read' (near past)
      (c) e-bi-tábu)φ [$_{RC}$ (∗ba/bi)-som-ére])φ
           AUG-C8-book   C2.SM/C8.SM-read-FV
           'The books read.' (near past)

Thus we imagine that the predicted boundary preceding reduced RCs was dropped in order to disambiguate that structure with a matrix clause interpretation and eventually this processing consideration was grammaticalized as ∗) Red Rel and extended to reduced RCs across the board. We expand the intuition behind ∗) Red Rel to explain a second necessary, but peculiar constraint needed to account for a second puzzling prosodic structure in the domain of reduced relative clauses.

5.2. *Reduced object relative clauses with overt subjects*

In reduced object relative clauses with overt subjects, the relativized nominal bears a H tone, but the subject of the relative clause does not. The crucial example is provided in (70-a) next to the predicted form in (70-b):

(70) (a) o-mw-áána)φ [$_{RC}$ a-ba-limi   ba-ta-góónz-a])φ
            AUG-C1-child   AUG-C2-farmer C2.SM-NEG-like-FV
            'the child that the farmers don't like'
      (b) *o-mw-aana [$_{RC}$ a-ba-lími)φ   ba-ta-góónz-a])φ
            AUG-C1-child   AUG-C2-farmer C2.SM-NEG-like-FV
            Intended: the child that the farmers don't like

The attested H tone distribution is surprising for two reasons: i) the head of
reduced relatives do not usually bear a H tone, cf. (71-a) and ii) subjects across
construction types typically *do* bear a H tone, cf. (71-b).

(71) (a) a-baa-ntu   [$_{RC}$ ba-sóm-a])φ
            AUG-C2-people   C2.SM-read-FV
            'people who read' (habitual)
      (b) A-ba-lími)φ   ba-ka-kór-a)φ
            AUG-C2-farmer C2.SM-PST-work-FV
            'The farmers worked.'

Based on the syntactic account of Rutooro that we have been building, we
predic— contrary to fact—that i) *omwáána* 'child' would be realized all-Low,
because it is not realized at the right edge of a syntactic XP, and ii) *abalimi*
'farmers' would be realized with a H tone for the reason that it does sit at the
right edge of an XP. In the tree in (72), the complex D corresponding to *omwáána*
'child', where we expect *omwaana* without a H on the penultimate syllable, is
underlined. The DP corresponding to *abalimi* 'farmers', where we expect *abalími*
with a H on the penultimate syllable, is boxed.

(72) High tone assignment in a reduced object RC with an overt subject (70-a)
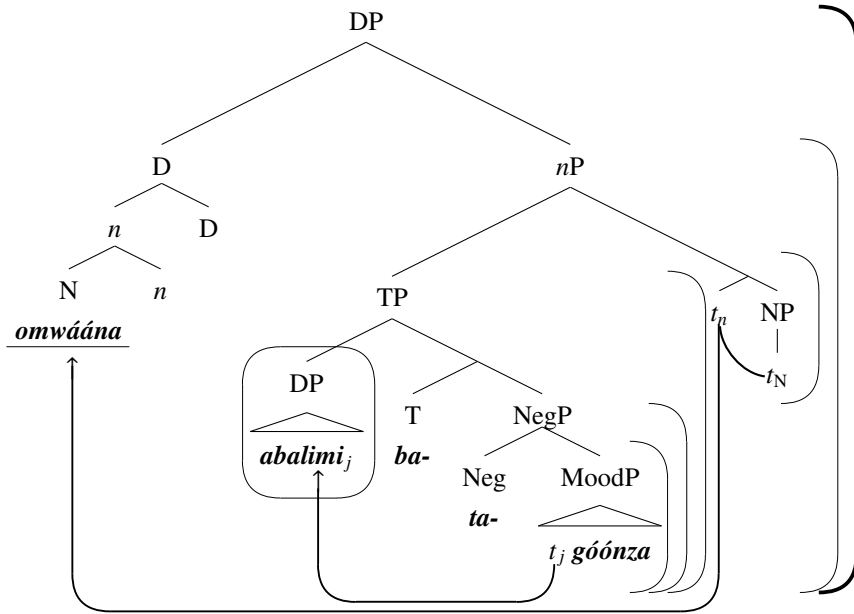
To summarize the problematic data introduced in this section and in Section 5.1, in a subset of reduced RCs, we find XPs that are *not* marked with a H tone, and one instance of an X^0 that *is* marked with a H tone, even though it is not at the right edge of a φ-phrase, according to our syntactic analysis.

Once again, we might consider revisiting the syntax of reduced relative clauses; however, we know that reduced object relative clauses with and without lexical subjects do not represent different clause sizes. Whether or not the subject is pronounced, subject agreement is present. Reduced RCs that lack overt subjects exhibit pro-drop, as opposed to, say, less structure.

The absence of a H tone on the RC's subject is directly accounted for by ∗) Red Rel—the constraint proposed in Section 5.1. As such, we momentarily leave that aspect of the prosodic realization of these reduced RCs aside. Instead, we note that while the unexpected H tone on the relativized head (shown underlined in (72)) in reduced relative clauses with overt subjects is nonisomorphic with the syntax, it is consistent with a general observation about adjacent DPs in the language. Namely, immediately adjacent DPs are typically separated by a φ-phrase boundary. The examples in (73) illustrate this point.

(73) (a) A-ba-somésa)φ ba-k-olek a-bá-ána)φ e-mí-ti)φ
          aug-C2-teacher C2.sm-pst-show aug-C1-child aug-C4-tree
   'The teachers showed the children the trees.'

    (b) o-múú-ntu)φ mu-somésa)φ
          AUG-C1-person C1-teacher
          'The person is a teacher.'

When we compare two adjacent DPs in a ditransitive clause (73-a) and a nominal predicate (73-b), we find that the first nominal is marked H. In fact, the closest example we could find in which two adjacent DPs are not separated by φ-phrase boundary comes from the possessive construction, in which the possessor DP and possessum DP are not separated by a φ-phrse boundary, but are separated by a linking element, as shown in (74):

(74) e-by-ookulya by-'   oo-mu-lími)φ
      AUG-C8-food C8-LNK AUG-C1-farmer
      'the farmer's food'

Because left edges are unmarked in Rutooro, and because boundary cues aren't gradient, i.e. the H tone is not louder or higher when it corresponds with multiple syntactic XPs, strings of NOUN NOUN)φ RC)φ represent a number of different syntactic constituencies, the most likely of which are shown in (75)

(75) NOUN NOUN)φ RC stem)φ

    (a) [NOUN [[NOUN] RC stem]]

    (b) [NOUN [NOUN] [RC stem]]

    (c) [[NOUN [NOUN]] [RC stem]]
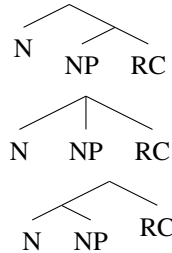
In (75-a)—but not (75-b) or (75-c)—the second noun and the RC stem form a unique constituent, while in (75-c)—but not (75-a) or (75-b)—the first and second noun form a unique constituent, much like possessive constructions. Thus, we can describe the prosodic structure in (75) as being indeterminate (76), because it is the output of more than one syntactic configuration, and crucially, we suspect, more than one syntactic configuration that has an analogue in the language.

(76) **Indeterminate prosodic structure:** Prosodic structure that could be the output of more than one syntactic configuration is indeterminate.

The question is whether H tones are such a reliable indicator of constituency, that a NOUN NOUN)φ RC)φ string is disallowed, because it could point to an unintended constituency. If so, this would motivate the second constraint that we need to account for the H tone distribution in reduced relative clauses—N)N— which is defined in (77):

(77) N)N: Assign a penalty to adjacent DPs not separated by a prosodic boundary.

Once N)N is added into the account, we predict the attested phrasing for reduced object RCs with overt subjects, as shown in (78):

(78) Assigning prosodic structure to (70-a):

Input: [DPNoun[nP [TP [DPNoun] Red Rel]]]	N)N	∗) Red Rel	Match Phrase
a. Noun Noun)φ Red Rel)φ	∗!	∗	
b. Noun Noun Red Rel)φ	∗!		∗
c. Noun)φ Noun)φ Red Rel)φ		∗!	∗
d. ☞ Noun)φ Noun Red Rel)φ			∗∗

The fact of the matter is that we need the constraint N)N to account for the anomalous phrasing of reduced object RCs with overt subjects. We have sketched the beginning of a proposal that would treat the anomalous prosodic structure of reduced object relative clauses with overt subjects as an attempt to unambiguously represent the underlying syntactic constituency of the phrase. The attested, non-isomorphic phrasing prevents an indeterminate prosodic structure from surfacing that, while predicted by the syntax and resolvable by the morphology, would result in the violation of the otherwise reliable correspondence between syntactic and prosodic constituents in the language. Thus, while the prosodic realization of one specific construction in the language is exceptional, this exception allows for greater regularity in the signaling of syntactic constituency via prosodic structure. Of course, the viability of this explanation rests on our availability to find similar scenarios in other languages, which we leave for future research.

6. Conclusion

While Rutooro has lost the underlying tonal contrast exhibited in most other Bantu languages, the distribution of High tones within phrases is complex. Many words surface as all-Low, no word ever has more than one High, and in certain contexts, every word in an utterance has a High tone. The heart of our proposal is that High tones are found at the right edges of phonological phrases—specifically on the penultimate syllable of phrase-final words. Match Theory, predicts that the edges of phonological phrases coincide with the edges of syntactic XPs. We show that this makes correct predictions regarding most surface H tones, if one assumes a parallel syntactic structure between the attachment height of verbal arguments within the CP (e.g. subject versus object) and modifiers within the DP (e.g. our Type 1 vs. Type 2). After discussing the distinction between high and low attaching modifiers within the DP, we explored relative clauses.

    We demonstrated that unlike closely related languages, Rutooro exhibits two

different RC types, a distinction we characterized as full versus reduced. While the distribution of High tones within full relative clauses is directly predicted by our MATCH-theoretic account, we showed several apparent tonal anomalies within reduced relatives. We accounted for apparent exceptions with additional OT constraints. In two cases, a High tone was predicted to occur but did not, and in another, case a High surfaced in a location where it was not predicted to appear. To account for the lack of a High tone on i) modifiers that intervene between the head and stem of reduced RCs and ii) overt subject DPs in non-subject relatives, we posited a constraint which penalizes a phonological phrase boundary before a reduced relative. We argued that the motivation for such a constraint might be to disambiguate a potential neutralization of main clause verb forms with their corresponding relatives. To account for the presence of a High tone on the heads of non-subject relatives with overt subejcts, we posited a constraint mandating a phonological phrase boundary surface between two successive nouns. This study thus adds to a growing body of research which seeks to explore the range of factors, formalized as constraints, which may dominate the basic mapping of prosodic phrases as proposed in Match Theory.

REFERENCES

Allen, Asiimwe. 2014. *Definiteness and specificity in runyankore-rukiga*: Stellenbosch University dissertation.

Bennett, Ryan & Emily Elfner. to appear. The syntax-prosody interface. *Annual Review of Linguistics* .

Bennett, Ryan, Emily Elfner & James McCloskey. 2015. Pronouns and prosody in Irish. In Liam Breatnach, Ruairí Ó hUiginn, Damian McManus & Katharine Simms (eds.), *Selected proceedings of the XIV International Congress of Celtic Studies*, 19–74. Dublin: Dublin Institute for Advanced Studies.

Bennett, Ryan, Emily Elfner & James McCloskey. 2016. Lightest to the right: an anomolous displacement in Irish. *Linguistic Inquiry* 47. 169–234.

Bennett, Ryan, Emily Elfner & James McCloskey. to appear. Prosody, focus and ellipsis in Irish. *Language* .

Bhatt, Rajesh. 2002. The raising analysis of relative clauses: Evidence from adjectival modification. *Natural Language Semantics* 10. 43–90.

Bianchi, Valentina. 2000. The raising analysis of relative clauses: A reply to Borsley. *Linguistic Inquiry* 31(1). 123–140.

Bickmore, Lee. 2007. *Cilungu phonology*. Stanford, CA: Center for the Study of Language and Information.

Bickmore, Lee. to appear(a). Liquid realization in Rutooro. *Language Science Press* .

Bickmore, Lee. to appear(b). Unaltered morphemes as phonological triggers and targets in Rutooro. *Journal of African Languages and Linguistics* .

Bresnan, Joan & Sam A. Mchombo. 1987. Topic, pronoun, and agreement in Chicheŵa. *Language* 63. 741–782.

Buell, Leston. 2005. *Issues in Zulu verbal morphosyntax*: University of California Los Angeles dissertation.

Carstens, Vicki. 2000. Concord in Minimalist Theory. *Linguistic Inquiry* 31(2). 319–355.

Carstens, Vicki. 2008. DP in Bantu and Romance. In Katherine De Cat, Cécile Demuth (ed.), *The Bantu-Romance connection: A comparative investigation of verbal agreement, DPs, and information structure*, vol. 131, 131–165. Linguistik Aktuell/Linguistics Today.

Cheng, Lisa & Laura J Downing. 2007. The prosody and syntax of Zulu relative clauses. In Nancy C. Kula & Lutz Marten (eds.), *Bantu in Bloomsbury: Special issue on Bantu linguistics,*, vol. 15, 51–63. SOAS Working Papers in Linguistics.

Cheng, Lisa L-S & Laura J Downing. 2010. *Locative relatives in Durban Zulu*. Universitätsbibliothek Johann Christian Senckenberg.

Cheng, Lisa Lai-Shen & Laura J. Downing. 2009. Where's the topic in Zulu? *The Linguistic Review* 26. 207–238.

Cheng, Lisa Lai-Shen & Laura J. Downing. 2012. Against FocusP: Arguments from Zulu. In Ivona Kučerová & Ad Neeleman (eds.), *Contrasts and positions in information structure*, 247–266. Cambridge, UK: Cambridge University Press.

Chomsky, Noam. 1977. *Essays on form and interpretation*. New York: North-Holland.

Chomsky, Noam. 2000. Minimalist inquiries: the framework. In Roger Martin, David Michaels & Juan Uriagereka (eds.), *Step by step: Essays on minimalist syntax in honor of Howard Lasnik*, 89–155. Cambridge, MA: MIT Press.

Chomsky, Noam. 2001. Derivation by phase. In Michael Kenstowicz (ed.), *Ken Hale: A life in language*, 1–52. Cambridge, MA: MIT Press.

Clemens, Lauren. 2014. *Prosodic noun incorporation and verb-initial syntax*. Cambidge, MA: Harvard University dissertation.

Clemens, Lauren. 2019. The use of prosody as a diagnostic for syntactic structure: The case of verb-initial order. University at Albany, State University of New York.

Clemens, Lauren. to appear. Prosodic noun incorporation: The relationship between prosody and argument structure in Niuean. *Syntax* .

De Blois, K. F. 1970. The augment in the Bantu languages. *Africana Linguistica* 4. 85–165.

Downing, Laura J. & Larry M. Hyman. 2015. Information structure in Bantu. In Caroline Féry & Shinichiro Ishihara (eds.), *The oxford handbook of information structure*, 790–813. Oxford: Oxford University Press.

Duranti, Alessandro. 1997. Relative clauses. In Larry Hyman Ernest Rugwa Byarushengo, Alessandro Duranti (ed.), *Haya grammatical structure* (Southern California Occasional Papers in Linguistics 6), University of Southern California Deptartment of Linguistics.

Elfner, Emily. 2012. *Syntax-prosody interactions in Irish*: University of Massachusetts Amherst dissertation.

Elfner, Emily. 2015. Recursion in prosodic phrasing: Evidence from Connemara Irish. *Natural Language and Linguistic Theory* 33. 1169–1208.

Elfner, Emily. 2018. The syntax-prosody interface: current theoretical approaches and outstanding questions. *Linguistics Vanguard* 4(1).

Freeze, Ray. 1992. Existentials and other locatives. *Language* 68. 553–595.

Halpert, Claire. 2015. *Argument licensing and agreement* Studies in Comparative Syntax. Oxford: Oxford University Press.

Halpert, Claire. to appear. The augment. In *The oxford handbook of bantu linguistics*, Oxford: Oxford University Press.

Henderson, Brent. 2006. *The syntax and typology of Bantu relative clauses*: University of Illinois at Urbana-Champaign dissertation.

Henderson, Brent. 2007. The syntax of agreement in Bantu relatives. In *Texas linguistic society IX: The morphosyntax of underrepresented languages*, 167–184.

Hyman, Larry M & Francis X Katamba. 2010. Tone, syntax, and prosodic domains in Luganda. In Laura Downing, Annie Rialland, Jean-Marc Beltzung, Sophie Manus, Cédric Patin & Kristina Riedel (eds.), *Papers from the workshop on bantu relative clauses*, vol. 53, 69–98. ZAS Papers in Linguistics.

Itô, Junko & Armin Mester. 2013. Prosodic subcategories in Japanese. *Lingua* 124. 20–40.

Jackendoff, Ray. 1977. *X syntax: A study of phrase structure*. Cambridge, MA: MIT Press.

Julien, Marit. 2002. *Syntactic heads and word formation* Oxford Studies in Comparative Syntax. Oxford: Oxford University Press.

Kaji, Shigeki. 2007. *A Rutooro vocabulary*. Tokyo: Research Institute for Languages and Cultures of Asia and Africa (ILCAA).

Kaji, Shigeki. 2009. Tone and syntax in Rutooro, a toneless Bantu language of Western Uganda. *Language Sciences* 31(2-3). 239–247.

Kaji, Shigeki. 2010. A comparative study of tone of west ugandan bantu languages, with particular focus on the tone loss in Tooro. In Laura Downing, Annie Rialland, Jean-Marc Beltzung, Sophie Manus, Cédric Patin & Kristina Riedel (eds.), *Papers from the workshop on bantu relative clauses*, vol. 53, 33–51. ZAS Papers in Linguistics.

Kaji, Shigeki. 2018. From Nyoro to Tooro: Historical and phonetic accounts of tone merger. *Tonal Change and Neutralization* 27. 330.

Kayne, Richard. 1994. *The antisymmetry of syntax*. Cambridge, MA: MIT Press.

Keenan, Edward L. 1987. A semantic definition of "Indefinite NP". In Eric Reuland & Alice ter Meulen (eds.), *The representation of (in)definiteness*, 286–317. Cambridge, MA: MIT Press.

Keenan, Edward L. 2003. The definiteness effect: semantic or pragmatic? *Natural Language Semantics* 11. 187–216.

Kisseberth, Charles & Mohammad Abasheikh. 2011. Chimwiini phonological phrases revisted. *Lingua* 121(13). 1987–2013.

Kisseberth, Charles. & David Odden. 2003. Tone. In Derek Nurse & Gérald Philippson (eds.), *The Bantu languages*, 59–70. Routledge: Routledge Press.

Kula, Nancy & Lee Bickmore. 2015. Phrasal phonology in Copperbelt Bemba. *Phonology* 32. 147–176.

Lesholo, Rose. 2002. *Syntactic domains in Ikalanga*: University of Michigan, Ann Arbor dissertation.

Meeussen, A.E. 1967. Bantu grammatical reconstructions. *Africana Linguistica* 3. 79–121.

Milsark, Gary. 1974. *Existential sentences in English*: Massachusetts Institute of Technology dissertation.

Milsark, Gary. 1977. Toward an explanation of certain peculiarities of the existential construction in English. *Linguistic Analysis* 3. 1–30.

Myrberg, Sara. 2013. Sisterhood in prosodic branching. *Phonology* 30(1). 73–124.

Nevins, Andrew. 2007. The representation of third person and its consequences for person-case effects. *Natural Language Linguistic Theory* 25(2). 273–313.

Oxford, Will. 2017. The activity condition as a microparameter. *Linguistic Inquiry* 48. 711–722.

Pak, Marjorie. 2007. Relative clauses without CPs in Luganda.". In Rebecca Colavin, Kathryn Cooke, Kathryn Davidson, Shin Fukuda & Alex Del Guidice (eds.), *Proceedings of the 37^{t}h western conference on linguistics*, 189–2011. California: Department of Linguistics, University of California, San Diego.

Partee, Barbara. 1975. Montague grammar and transformational grammar. *Linguistic inquiry* 6. 203–300.

Perlmutter, David. 1968. *Deep and surface structure constraints in syntax*: Massachusetts Institute of Technology dissertation.

Persohn, Bastian. 2017. *The verb in Nyakyusa*. Berlin: Language Science Press.

Pietraszko, Asia. 2019. Obligatory CP nominalization in Ndebele. *Syntax* 22(1). 66–111.

Preminger, Omer. 2014. *Agreement and its failures*. Cambridge, MA: MIT Press.

Selkirk, Elisabeth. 1986. On derived domains in sentence phonology. *Phonology Yearbook* 3. 371–405.

Selkirk, Elisabeth. 1995. The prosodic structure of function words. In Jill N. Beckman, Laura Walsh Dickey & Suzanne Urbancyzk (eds.), *University of massachusetts occasional papers in linguistics 18: Papers in optimality theory*, Amherst, MA: Graduate Linguistic Student Association, University of Massachusetts, Amherst.

Selkirk, Elisabeth. 2000. The interaction of constraints on prosodic phrasing. In M. Horne (ed.), *Prosody: Theory and experiment*, 231–261. Dordrecht: Kluwer.

Selkirk, Elisabeth. 2011. The syntax-phonology interface. In John Goldsmith, Jason Riggle & Alan C. L. Yu (eds.), *The handbook of phonological theory*, 435–484. Wiley-Blackwell 2nd edn.

Simons, Gary F. & Charles D. Fennig (eds.). 2017. *Ethnologue: Languages of the world, 20 th ed.* Dallas, TX: SIL International. http://www.ethnologue.com.

Truckenbrodt, Hubert. 1995. *Phonological phrases: Their relation to syntax, focus, and prominence*: Massachusetts Institute of Technology dissertation.

Truckenbrodt, Hubert. 1999. On the relation between syntactic phrases and phonological phrases. *Linguistic Inquiry* 30. 219–256.

Truckenbrodt, Hubert. 2007. The syntax-phonology interface. In Paul deLacy (ed.), *The cambridge handbook of phonology*, 435–456. Cambridge, UK: Cambridge University Press.

Tyler, Matthew. to appear. Simplifying MATCH WORD: Evidence from English functional categories. *Glossa* .

Wexler, Kenneth & Peter Culicover. 1980. *Formal principles of language acquisition*. Cambridge, MA: MIT Press.

Zeller, Jochen. 2004. Relative clause formation in the bantu languages of south africa. *Southern African Linguistics and Applied Language Studies* 22(1-2). 75–93.

Zentz, Jason. 2016. *Forming wh-questions in Shona: A comparative Bantu perspective*: Yale University dissertation.

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