Prosody Outranks Syntax:

An Optimality Approach to Subject Inversion in Bantu Relatives[*]

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Bantu languages exhibit two different surface word orders in object relative clauses (Demuth & Harford 1999). Some languages (e.g. Sesotho) preserve basic SV word order, while others (e.g. Chishona) exhibit VS word order. Closer analysis reveals that the object relative complementizer in Sesotho is a disyllabic prosodic word, whereas the object relative complementizer in Chishona is a monosyllabic prosodic clitic that triggers verb-raising to C^0. This paper analyzes these data within the framework of Optimality Theory, showing how morpho-phonological constraints on the prosodic shape of words dominate syntactic constraints on verb movement. These findings appear problematic for recent proposals that syntactic constraints dominate all prosodic constraints, and that prosodic constraints operate only on pairs of equally well-formed syntactic constructions (Golston 1995). Implications for the nature of the prosody-syntax interface are discussed.

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0. Introduction

The possibility of interaction between syntax and phonology has been a much-debated issue. One view has been that, while syntax can influence phonology, the reverse is not the case; i.e., phonology cannot influence syntax (Zwicky & Pullum 1986). This view is reflected in theories positing a prosodic level of representation, in which phonological constituents constructed from syntactic structures are the domains for phonological processes (Selkirk 1986, Nespor & Vogel 1982, 1986, Hayes 1989). Overall, such a view reflects the assumption embodied in derivational theories that 'syntax feeds phonology' (Chomsky & Halle 1968, Tranel 1998). A more radical view is taken by Zec & Inkelas (1990), who propose that syntax-phonology interactions are bidirectional, implemented within a non-derivational model.

Optimality Theory (OT) (McCarthy & Prince 1993, Prince & Smolensky 1993) offers wider possibilities for exploring the interaction between these traditionally separate modules of grammar, in that there are no *a priori* restrictions on the ranking of constraints. Tranel (1998) proposes that all syntactic constraints outrank all phonological constraints, on the grounds that intermingling of constraints would fatally weaken an OT theory of language typology. In the course of reanalyzing a putative counterexample involving gender in French, he argues, following Golston (1995), that apparent cases of phonology influencing syntax are merely cases in which the phonology resolves issues left undecided by the syntax. Golston (1995) takes these issues a step further by proposing that syntactic constraints outrank prosodic constraints. In particular, Golston proposes that prosody plays a role only in choosing between structures which

are syntactically equally well-formed. That is, he proposes that prosody will determine well-formedness only when the syntax does not.

This paper argues that Bantu languages like Chishona present a counterexample to the claim that syntactic constraints necessarily outrank all prosodic constraints within an OT framework. It is proposed that these languages present a case where a syntactic constraint against movement (STAY) (Grimshaw 1997) is violated in order to satisfy a more highly-ranked prosodic constraint against monosyllabic words (MINPW) (cf. McCarthy & Prince 1986, 1991, Kanerva 1990, Myers 1987, 1995). That is, the prosodic constraint does not select between two equally good syntactic constructions, nor does it contribute only when the syntax is indeterminant. Rather, certain prosodic constraints must be satisfied, even at the cost of violating lower-ranked syntactic constraints. The argument is based on two different object relativization strategies in different Bantu languages, one in which verb raising to C^0 is obligatory in object relative clauses, giving rise to apparent 'subject inversion' (e.g. Chishona – spoken in Zimbabwe), and another in which verb raising does not occur, resulting in basic SV word order in the embedded relative clause (e.g. Sesotho – spoken in Lesotho and South Africa). In both cases, it is the prosodic status of the relative complementizer that determines the syntax of word order. Interestingly, Kiswahili (spoken widely in East Africa), which has two different forms of the object relative complementizer, uses both strategies, as predicted.

The paper is organized as follows. Section 1 describes the two types of Bantu object relative clauses, illustrating the complementary distribution between verb raising and concomitant 'subject inversion', and the prosodic status of the relative complementizer. Section 2 provides a syntactic analysis for these constructions. Section 3 develops an OT account,

showing that the constraint on prosodic words dominates the constraint against verb movement.

Section 4 compares verb movement in Bantu languages to that found in languages like German,

and discusses some theoretically interesting differences. Section 5 concludes with a discussion

of the theoretical implications of these findings for the nature of the prosody-syntax interface.

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1. Object Relative Clauses in Sesotho, Chishona, and Kiswahili

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      Both Sesotho and Chishona have basic SVO word order (Doke & Mofokeng 1957,

Fortune 1955, 1967, 1985), in common with many other Bantu languages. However, different

word orders appear in object relative clauses. In Sesotho, SV order is preserved in object

relatives (Doke & Mofokeng 1957, Demuth 1995) (relative complementizers (REL) and relative

finite verbs are in boldface):[1]

!

     1.   dikobo **tseo** basadi **ba-di-rekileng** kajeno

             10/blankets 10/REL 2/women SM2-OM10-bought today

             'the blankets which the women bought today'

!

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[1] Grammatical morphemes are glossed as follows: INF = infinitive, OM = (resumptive) object

marker, PAST = past, PERF = perfect aspect, REL = relative complementizer, SM = subject-

verb agreement, TAM = tense/aspect marker. Numbers = noun classes.

In this example, the relative complementizer *tseo* agrees in noun class with the head noun *dikobo* 'blankets'; both belong to Class 10. The relative complementizer, as in other Bantu languages, is derived from one of the demonstrative pronouns. The subject of the relative clause is *basadi* 'women' which controls the Class 2 subject agreement marker on the verb. The Class 10 object marker acts as a resumptive pronoun for the extracted object *dikobo*. Note that the subject may not appear immediately following the verb (2a) but may be extraposed or right-dislocated (2b):

!

       2.a.   *dikobo **tseo ba-di-rekileng** basadi kajeno

                10/blankets 10/REL SM2-OM10-bought 2/women today

       b.   dikobo **tseo ba-di-rekileng** kajeno basadi

                10/blankets 10/REL SM2-OM10-bought today 2/women

                'the blankets which they bought today, the women'

!

In contrast, Chishona prefers that the subject follow the verb in an object relative clause, resulting in VS order in the embedded relative clause:

!

       3.   mbatya **dza-v-aka-sona** vakadzi

                10/clothes 10/REL-SM2-TAM-sew 2/women

                'the clothes which the women sewed'

!

The head noun in example (3) is the Class 10 noun *mbatya* 'clothes'. The relative

complementizer consists of a noun class agreement morpheme plus what Fortune (1985:145)

refers to as the possessive -A-. The subject of the relative clause is *vakadzi* 'women', which

controls the Class 2 subject agreement marker on the verb. It follows the verb *vakasona*, to

which the Class 10 relative complementizer is prefixed. In the marginally acceptable alternative

structure in (4), the subject precedes the verb, but this appears to be a very marked construction,

perhaps restricted to certain discourse contexts. Note, however, that the relative complementizer

still prefixes to the verb:

!

    4.   ?mbatya vakadzi **dza-v-aka-sona**

        10/clothes 2/women 10/REL-SM2-TAM-sew

        'the clothes which the women sewed'

!

Regardless of where the subject appears, the key characteristic of Chisona object relatives is that

the relative complementizer is cliticized to the verb, with nothing permitted to intervene; the

order REL S V seen in (1) for Sesotho is impossible in Chishona:

!

    5.   *mbatya **dza** vakadzi **v-aka-sona**

        10/clothes 10/REL 2/women SM2-TAM-sew

        'the clothes which the women sewed'

!

The contrast between these two relativization strategies was noticed by Meeussen (1971) and Givón (1972), who noted that subject inversion in relative clauses occurs when the relative complementizer is a bound morpheme (the Universal Pronoun Attraction Principle). Note that the Chishona relative complementizer is monosyllabic, unlike its Sesotho counterpart, which is disyllabic. Lexical items in many Bantu languages must contain at least two syllables (be a binary foot) in order to constitute a phonological word (Kanerva 1989, Myers 1987,1995, Park 1995). The Sesotho relative complementizer is therefore an independent lexical item. The Chishona relative complementizer, on the other hand, cannot stand on its own and must cliticize to the verb to achieve 'word-hood'.

Note also that the relative complementizer cannot cliticize to the subject of the relative clause:

!

6.　　　*mbatya **dza**-vakadzi **v-aka-sona**

10/clothes 10/REL-2/women SM2-TAM-sew

'the clothes which the women sewed'

!

We attribute the ungrammaticality of (6) to a requirement on the relative complementizer that it cliticize to a head within its extended projection (Grimshaw 1991). Following the familiar assumption that the relative complementizer occupies C^0, it therefore forms an extended projection with I^0, and V^0, but not the subject of the clause, which occupies only specifier positions. If the relative complementizer cliticizes to the subject, the subject is interpreted as its complement and the remainder of the relative clause becomes uninterpretable.

So far, we have contrasted relativization strategies in Sesotho and Chishona. In Sesotho, the object relative complementizer is a disyllabic, independent prosodic word, and there is no verb raising/subject inversion. In Chishona, the preferred strategy is for the subject to follow the verb, to which the relative complementizer is cliticized. We turn now to a consideration of Kiswahili, a language which exhibits the use of both constructions. As predicted, however, each occurs with a different form of the relative complementizer.

Kiswahili is typically described as having three different relative clause constructions (Ashton 1947, Barrett-Keach 1980, 1986). The first type, illustrated in (8), is like that found in Sesotho. The relative complementizer is composed of an independent lexical item *amba*, to which is suffixed the relative morpheme that agrees with the head noun (referred to as the *-o* of reference by Ashton (1947) and the 'inanimate pronominal clitic' (PC) by Barrett-Keach (1986: 560)). The following examples come from Tyler (1985).

!

> 7.　　kitabu **amba-cho** mtoto **a-me-ki-ona** jana
>
> 　　　7/book REL- 7 1/child SM1-PERF-OM7- see yesterday
>
> 　　　'the book which the child saw yesterday'

!

In this example, Class 7 *–cho*, which suffixes to *amba*, agrees with the Class 7 head noun *kitabu* 'book'. The subject of the relative clause is the Class 1 noun *mtoto* 'child', which controls subject agreement on the verb. As in the Sesotho example (1) above, there is an object marker acting as a resumptive pronoun for the extracted object *kitabu*. Also like Sesotho (2a,b), the subject cannot immediately follow the verb (8a), but may be right-dislocated (8b):

!

    8. a.   *kitabu **amba-cho a-me-ki-ona** mtoto jana

              7/book REL- 7 SM1-PERF-OM7- see 1/child yesterday

              'the book which the child saw yesterday'

      b.   kitabu **amba-cho a-me-ki-ona** jana mtoto

              7/book REL- 7 SM1-PERF-OM7- see yesterday 1/child

              'the book which he saw yesterday, the child'

!

In addition to the *amba* relative, the relative agreement morpheme can function as a relative complementizer on its own, in which case it must cliticize to the verb. Depending on whether or not the verb contains one of a certain set of tense/aspect/modality morphemes, the relative clitic is either suffixed to the verb (9a) or appears immediately preceding the verb stem (9b) (cf. Barrett-Keach 1980, 1986).

!

    9.a.   kitabu **a-ki-taka-cho** Hamisi

              7/book SM1-OM7-want-REL7 H.

              'the book which Hamisi wants'

!

      b.   kitabu **a-li-cho**-**ki-ona** mtoto

              7/book SM1-PAST-REL7-OM7- see 1/child

              'the book which the child saw'

!

In both cases, preverbal subjects are disallowed (10a, 10b).

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      10.a.   *kitabu Hamisi **a-ki-taka-cho**

             7/book H. SM1-OM7-want-REL7

             'the book which Hamisi wants'

!

      b.   *kitabu mtoto **a-li-cho-ki-ona**

             7/book 1/child SM1-PAST-REL7-OM7- see

             'the book which the child saw'

!

Like the relative complementizer in Chishona, the Kiswahili relative clitic is a monosyllable

which must cliticize either to the lexical relative *amba* or to the verb. In the former case, the

combination of *amba* plus the relative clitic forms a lexical item independent of the verb, parallel

to the relative complementizer in Sesotho, and subject inversion is impossible (8a). In the latter

case, the relative clitic forms a phonological word with the verb, as in Chishona. In this case

subject inversion is obligatory (9a,b). Note that the nature of the clitic host and the direction of

cliticization in Chishona and Kiswahili are irrelevant for this generalization: what matters is that,

in both languages, the relative complementizer is a monosyllable and cliticization to the verb is

correlated with post-verbal subjects.

      In this section we have shown that there are the two different relativization strategies in

two different languages, Sesotho and Chishona, and have considered a third language, Kiswahili,

in which the two exist side by side. In both cases of subject inversion the relative complemetizer was cliticized to the verb. Like Givón (1972), we propose that this cliticization is the crucial factor correlated with subject inversion, and that this accounts for similar phenomena in other Bantu languages (Demuth & Harford 1999). The next section examines the syntax of these constructions, showing that 'subject-inversion' results from verb raising to C^o, with the subject being left behind in Spec-IP.
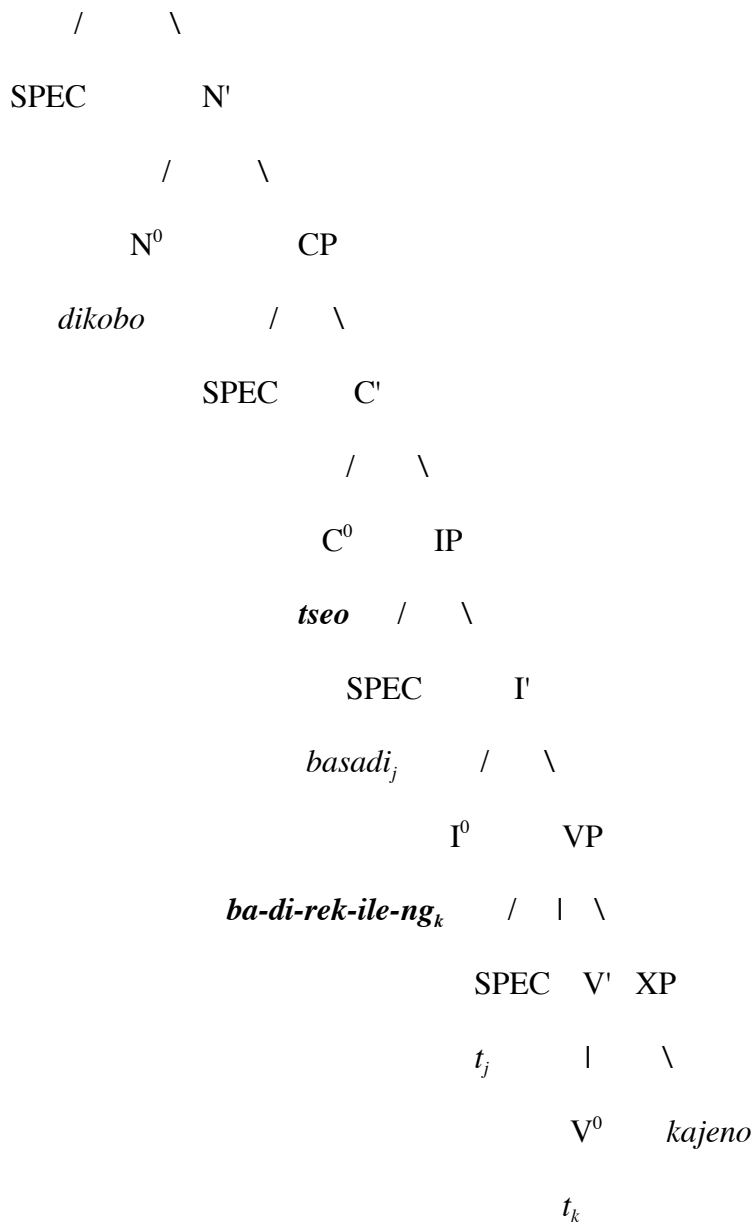
!

2. Relative Clitics and Verb Raising to C^o

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We begin our analysis of relative clauses with phrase structure, for which we assume the version of X-bar theory in which functional items, in addition to lexical items, are the heads of maximal projections (Chomsky 1989, Grimshaw 1991). This sort of structure, in which lexical and functional items are represented separately, is associated theoretically with head movement (Travis 1984), which unites the verb with its inflections in I^0 and moves the verb to C^0 in verb-second languages. A second type of movement relevant to this analysis is the movement of maximal categories to Spec. According to the VP-internal subject hypothesis (Kitagawa 1986, Sportiche 1988, Koopman & Sportiche 1991, Chomsky 1989), subject-verb agreement arises through Spec-Head agreement when the subject raises to Spec-IP from its base-generated position in Spec-VP. Adopting this model, we propose the same structure for relative clauses in both Sesotho and Chishona. Example (11) shows the movement of the verb from V^0 to I^0 and movement of the subject from Spec-VP to Spec-IP from their base-generated positions in the Sesotho relative clause. The relative complementizer *tseo* is base generated in C^0, and a null

operator is presumablly present in Spec-CP.   The result is the order of elements seen on the

surface in the Sesotho example (1).

!

11. NP

    /   \

SPEC   N'

      /   \

   N^0 CP

dikobo   /   \

     SPEC   C'

      /   \

     C^0 IP

  tseo   /   \

     SPEC   I'

  basadi$_j$ /   \

      I^0 VP

  ba-di-rek-ile-ng$_k$ / | \

       SPEC   V'   XP
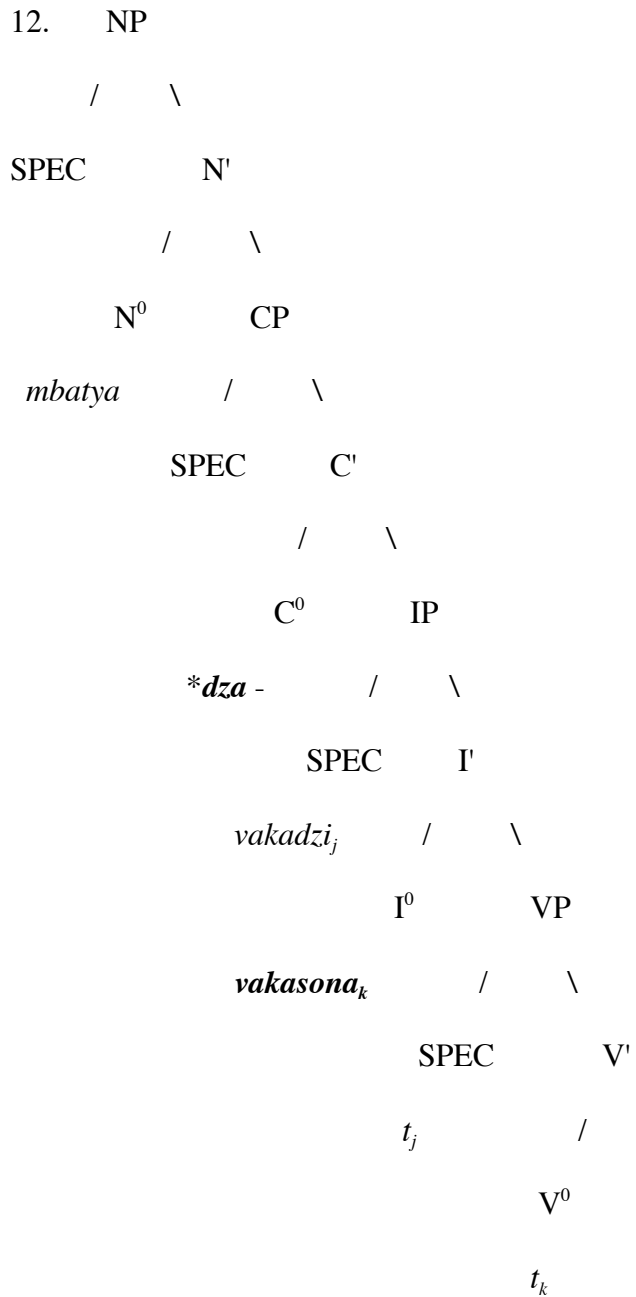
     t_j | \

      V^0 *kajeno*

      t_k

!

Now consider the Chishona structure in (12). The structure is the same as the relative assumed for Sesotho in (11); the D-structure is the same, as is movement of the verb and the subject. However, the result corresponds to the ungrammatical word order seen in example (5). Thus, although (12) is in principle syntactically well-formed, it is ill-formed phonologically, due to the fact that the monosyllabic relative complementizer is left stranded (as indicated by *).

!

12.　　NP
　　　　　/　　＼
　　SPEC　　　　N'
　　　　　　　/　　＼
　　　　　N⁰　　　CP
　　mbatya　　　/　　＼
　　　　　　SPEC　　C'
　　　　　　　　/　　＼
　　　　　　　C⁰　　　IP
　　　　　*dza -　　　/　　＼
　　　　　　　　SPEC　　I'
　　　　　　vakadzi_j　　/　　＼
　　　　　　　　　I⁰　　　VP
　　　　　　vakasona_k　　/　　＼
　　　　　　　　　SPEC　　　V'
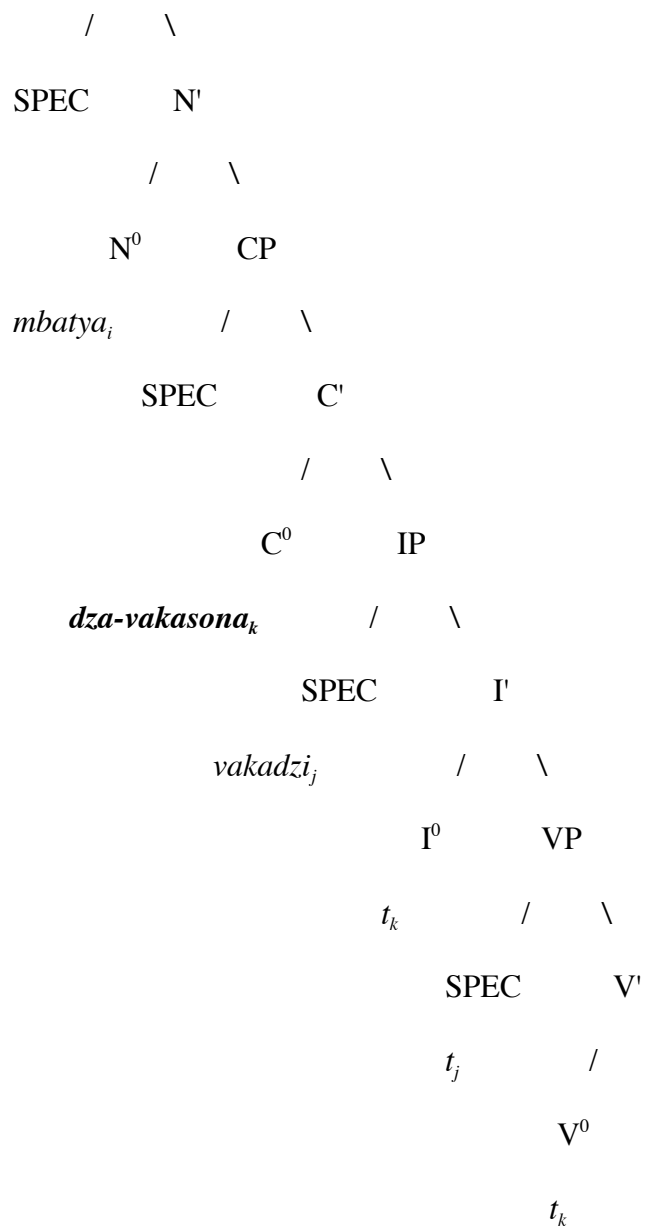　　　　　　　　t_j　　　　　/
　　　　　　　　　　　　V⁰
　　　　　　　　　　　　t_k

This problem can be resolved if the verb raises to C^0, providing a prosodic host for the relative clitic (13). Note that this then also results in the observed post-verbal subject, or 'subject

inversion' in Chishona in (3) (see Saccon (1992, 1993) for a similar analysis of subject inversion in Italian).

13. NP
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          /     \
     SPEC       N'
                /     \
           N⁰         CP
        mbatyaᵢ       /     \
                 SPEC         C'
                             /     \
                          C⁰         IP
                  dza-vakasonaₖ      /     \
                               SPEC         I'
                          vakadziⱼ         /     \
                                        I⁰         VP
                                        tₖ         /     \
                                               SPEC         V'
                                               tⱼ           /
                                                         V⁰
                                                         tₖ
```

In (13), the verb moves to C^0, past the subject in Spec-IP, producing the 'inverted subject' and providing the appropriate host for the clitic relative complementizer.

To summarize, we have argued for an analysis of Sesotho and Chishona relative clauses involving the following instances of head movement, with Kiswahili showing instances of both.

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14. Head Movement in Bantu Object Relatives

Sesotho	Chishona
V^0 to I^0	V^0 to I^0 to C^0

!!

In terms of phrase-structure, the two are identical (see Demuth & Harford (1999) for further discussion). The movement of I^0 to C^0 is the only difference between the two analyses, and is only found when the relative complementizer is a subminimal word, or monosyllabic clitic. That is, the two surface word orders that result are in complementary distribution. It is therefore difficult to conclude that there are two well-formed syntactic constructions for relative clause formation in Bantu languages: If this were the case we should expect verb raising to C^0 to occur even in the absence of a clitic in C^0, and/or the lack of verb raising even in the presence of a clitic. Such structures are unattested. Rather, it appears that there are two different syntactic constructions that cooccur with two different prosodic constructions. More specifically, it appears that the verb raising to C^0 only occurs when it is required. In the following section we discuss how the relative clause phenomena discussed here can be handled from an optimality theoretic perspective in terms of prosody-syntax constraint interactions.

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3. Interactions at the Prosody-Syntax Interface

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Given the types of prosody-syntax interactions discussed above, we propose that the different word order possibilities in object relative clauses in Sesotho and Chishona arise from an Optimality-type interaction between conflicting requirements of the grammar. According to the analysis developed in the preceding section, subject inversion in Chishona object relatives is the result of an extra obligatory movement of the verb from I^0 to C^0 which is forbidden in Sesotho (cf. (2a)). Movement in Chishona is motivated to relieve the ill-formed monosyllabicity of the relative complementizer, and we may infer that it may not take place in Sesotho precisely because the relative complementizer is already a prosodically well-formed prosodic word. As such, it saturates C^0 and blocks movement, much as complementizers do in German subordinate clauses.[2] Thus, we have a 'do something only when' situation (Prince & Smolensky 1993), which is typical of an OT interaction, not a Clash & Crash one (Pesetsky 1997). In OT terms, this situation suggests a constraint against movement, which may be violated to satisfy an overriding consideration, such as the need to satisfy the prosodic requirements of a morpheme or lexical item. Such a constraint against movement has been proposed by Grimshaw (1997) in an

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[2] Possible evidence that verb raising to C^0 is required when a clitic is present (rather than blocked when C^0 is filled, as in German), comes from the use of Sesotho object relative clauses in everyday discourse: when the Sesotho relative complementizer is 'optionally' dropped, no verb raising and concomitant 'subject inversion' occurs (Demuth1995). Thus, it would appear that it is the clitic which requires a prosodic host that is responsible for verb raising.

OT account of WH-constructions in English, echoing minimalism and economy (Chomsky 1991, 1993, 1995):

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     15. Economy of Movement (STAY): Trace is not allowed. (Grimshaw 1997: 374)

!

The requirement that well-formed lexical items be composed of at least two syllables has been formulated as a constraint against monosyllabic (monomoraic) lexical items:

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     16. MINPW: A prosodic word must consist of two syllables. (McCarthy & Prince 1991,

                   Myers 1995: 87)

!

Since we have seen that the word minimality requirement forces movement where it would not otherwise happen, this means, in OT terms, that MINPW outranks STAY:

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     17. MINPW >> STAY

!

The difference between the grammatical Sesotho example (2) (indicated by ☞) and its ungrammatical counterpart (3a) may be accounted for in terms of an extra STAY violation, as indicated in the following OT tableau.

18.	**tseo** basadi **badirekileng** ...	MINPW	STAY
☞ (2) ...**tseo** basadi **badirekileng** ...			*
(3a) ...**tseo badirekileng** basadi ...			**!

!

Note that, although MINPW outranks STAY, it has no effect on the selection of the optimal output in Sesotho because there are no monosyllabic words in the input. Compare now the same tableau for Chishona:

!

19.	**dza** vakadzi **vakasona**...	MINPW	STAY
☞ (4) ...**dzavakasona** vakadzi ...			**
(5) ...**dza** vakadzi **vakasona** ...		*!	*

!

These results are possible only if the phonological constraint MINPW outranks the syntactic constraint STAY.

It would therefore appear that Bantu languages such as Chishona and Kiswahili provide evidence of the interaction between prosodic and syntactic constraints, where the prosodic constraint dominates the syntactic one. Critically, it does not appear that the prosodic constraint mediates between two equally well-formed syntactic constructions. Rather, a highly-ranked prosodic constraint needs to be satisfied, and this is done at the cost of incurring violations of more lowly ranked constraints. The Bantu data therefore appear to be a counter example to Golston's (1995) claims.

We have already addressed the question of why the candidate (5) in the tableau in (19) is ill-formed: Presumably it would further violate the constraint on head-movement. But are there other possibilities for resolving the clitic status of the relative complementizer besides movement? As it turns out, many Bantu languages have other means of resolving word sub-minimality – i.e. through the addition of epenthetic vowels/syllables. Consider, for example, the monosyllabic Chishona verb *ku-pa* 'to give'. As a monosyllabic subminimal word it is not permitted to stand on its own in an imperative (**pa* 'give!'). Rather, Myers (1987:129) shows that it must epenthesize the vowel *i-*, thereby creating a disyllabic form and a well-formed prosodic word (*ipa* 'give!') (cf. Harford, in press). Interestingly, epenthesis is not used with monosyllabic verbs if there are other morphemes, such as a preceding object marker, which can cliticize to the verb to form a disyllabic prosodic word (Myers 1987). Thus, it would appear that incorporation of adjacent prosodic material is a preferred strategy for satisfying word minimality if available. However, when there is a lack of adjacent material, and no way for movement to satisfy the prosodic constraints of a sub-minimal word, then epenthesis is used as a last resort. Why, then, is epenthesis not available to repair the clitic relative complementizer in Chishona? It would appear that the constraint against epenthesis (DEP:I-O) is ranked above STAY. Given the following constraint against epenthesis,

    20. DEP:I-O: Every segment in the output has a segment in the input

<div align="right">(McCarthy & Prince 1994)</div>

we then posit the following ranking of constraints:

21. MINPW >> DEP:I-O >> STAY

Word minimality will be satisfied through syntactic processes of movement (and/or

incorporation) if possible, but if not (i.e. if no movement is possible, as in the case of a word in

isolation), then epenthesis will be invoked. Once again, we find another prosodic constraint

dominating a syntactic constraint, providing further support for the position of Zec & Inkelas

(1990).

This section has proposed an OT analysis of the two Bantu relativization strategies in

which subject inversion is correlated with the prosodic dependency of the relative

complementizer through the interaction of phonological and syntactic constraints. Crucially, two

prosodic constraints outrank a syntactic constraint, contra Golston's (1995) claims that such

interactions do not exist. In the following section, we consider possible alternatives to this

analysis.

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4. Alternative Analyses

If the analysis proposed above is correct, Bantu languages like Chishona and Kiswahili

are similar to several Germanic languages in having verb movement from I^0 to C^0 in unselected

clauses (Diesing 1990, Kiparsky 1995, Maling 1990, Platzack 1986, Rizzi 1990, Rögnvaldsson

& Thráinsson 1990, Santorini 1995, Vikner 1995, among others). However, the environment for

verb raising to C^0 differs amongst the two sets of languages. Germanic languages are well-

known for requiring the finite verb to be in second position in root clauses. This requirement

results in subject inversion in sentences in which something other than the subject is in first

position, as in the following examples from German (Roberts 1993: 5) (the subject and the finite

verb are in boldface):

!

     22.a.   **Ich las** schon letzes Jahr diesen Roman.

          'I read already last year this book'

!

     b.   Diesen Roman **las ich** schon letzes Jahr.

          'This book read I already last year'

!

     c.   Schon letzes Jahr **las ich** diesen Roman.

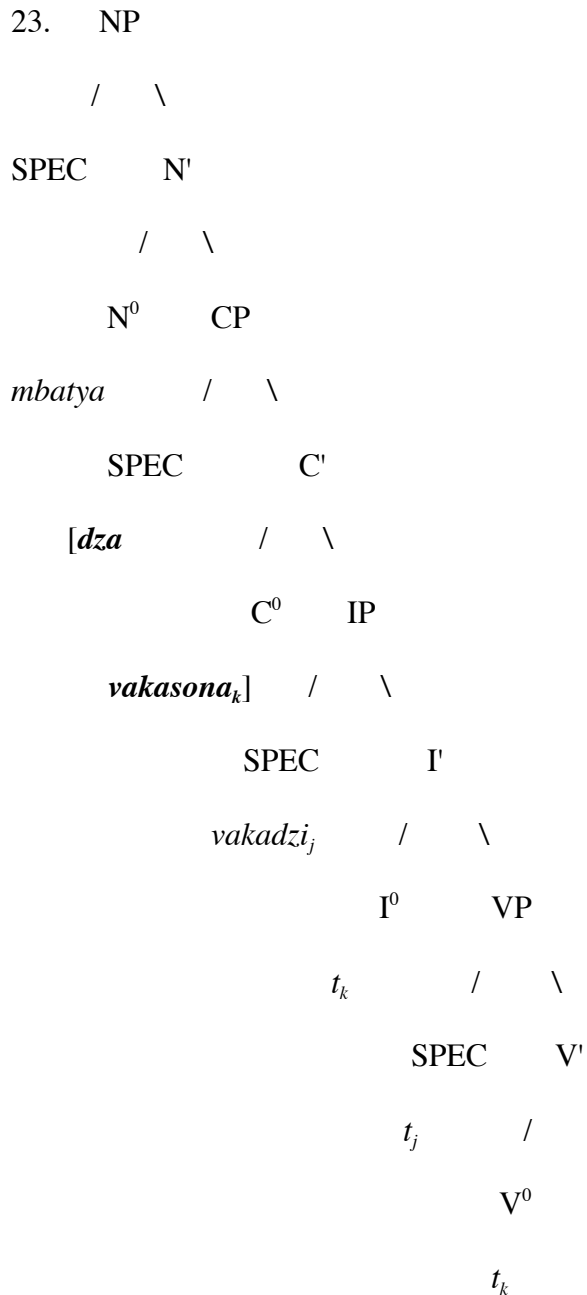   'Already last year read I this book'

!

     d.   *Schon letzes Jahr **ich las** diesen Roman.

However, the motivations for subject inversion in Germanic and Bantu languages are quite

different. There is some consensus that I^0 to C^0 movement in Germanic (V2) takes place to fill

the head of a CP whose specifier position contains a moved phrase. (Formulations of this

requirement include Rizzi's (1990) WH-Criterion and Grimshaw's (1997) OT constraint Ob-Hd).

Under our analysis, the motivation for movement in Bantu is purely prosodic. Alternatively, we

might analyze Bantu in a way that brings it closer to Germanic. Recall that the relative

complementizers in the Bantu languages under discussion have been identified with

demonstratives, possessives and pronouns, elements that also appear in substantive phrases,

although, in the case of monosyllables, they always cliticized to something else. We could say

that the elements we have labeled as being in C^0 are really either operators or DPs in Spec-CP

and that movement of the verb takes place to satisfy a syntactic requirement for a filled C^0. The

relative complementizer would then cliticize to the adjacent verb without forming a complex

syntactic head with it. Under these assumptions, the structure of the Chishona relative clause (4)

would be as follows (material within brackets is a phonological word):

23.   NP
     /   \
SPEC   N'
        /   \
     N^0 CP
mbatya   /   \
       SPEC   C'
     [*dza*   /   \
              C^0 IP
      vakasona$_k$]   /   \
                   SPEC   I'
               vakadzi$_j$ /   \
                         I^0 VP
                    t_k /   \
                             SPEC   V'
                     t_j /
                                 V^0
                                 t_k

!

There are a number of objections that we can make to this proposal. First, movement of I^0 to C^0 is found in Chishona only in relative clauses and adverbial clauses headed by a form of possessive -A- (Fortune 1967: 50-51). If we say that Bantu languages like Chishona and

Kiswahili have a V2 requirement, then the question arises of why the effects of this requirement

aren't seen in main clauses such as the following:

!

      24.   Gore r-aka-pera Tendai ø-aka-verenga bhuku iri

               5/year SM5-TAM-finish T. SM1-TAM-read 5/book 5/this

               'Last year Tendai read this book'

!

Example (24) has SV order, even though there is a temporal adverb *gore rakapera* 'last year' in

first position. Chishona, as well as other Bantu languages, have free inversion (or extraposition)

in main clauses of the type cited as characteristic of null subject languages such as Italian, but we

see no evidence for triggered inversion in main clauses of the sort seen in Germanic (cf. 25a,b).

!

      25. a.   Vakawanda va-ri ku-pinda

              2/many SM2-be INF-enter

              'Many are entering'

      b.   Va-ri ku-pinda vakawanda

              SM2-be INF-enter 2/many

              'Many are entering'

!

     Second, if we adopt the V2 analysis for Chishona relative clauses, then there is no reason

not to extend it to Sesotho relative clauses as well. We would then have to account for the

absence of inversion in Sesotho. However, we would be left with no obvious way to do this,

since the V2 analysis eliminates the correlation between the monosyllabicity of the relative

complementizer and movement. We would then be forced to stipulate the difference between the

two relativization strategies, and the prosodic generalization would be lost.

Third, recall that in the marked example (4 = 26), the subject of the relative clause

precedes the phonological word consisting of the relative complementizer plus the verb:
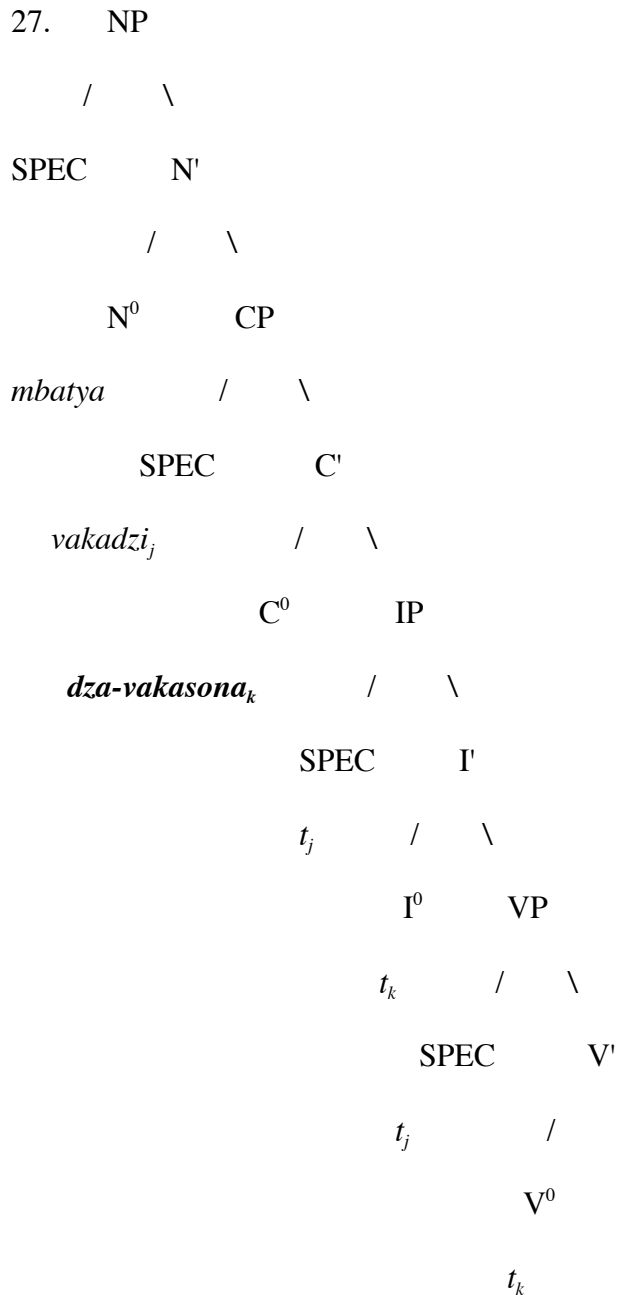
!

26.   ?mbatya vakadzi **dza-v-aka-sona**

10/clothes 2/women 10/REL-SM2-TAM-sew

'the clothes which the women sewed'

!

The analysis we have proposed provides a structure for this example as well, if we assume that

the subject of the relative clause, *vakadzi* 'women', moves from Spec-IP to Spec-CP:

27.   NP

      /   \

SPEC   N'

        /   \

      N^0 CP

mbatya   /   \

       SPEC   C'

    vakadzi$_j$ /   \

          C^0 IP

   dza-vakasona$_k$ /   \

          SPEC   I'

      t_j /   \

         I^0 VP

      t_k /   \

        SPEC   V'

      t_j /

          V^0

      t_k

We propose that the marked status of this example (which most likely involves interactions with other constraints having to do with topicalization/focus) may be due to the additional instance of movement, which incurs an extra STAY violation. However, if we adopt the V2 analysis of

relative clauses, in which Spec-CP is occupied by the relative complementizer, we lose this account.

Finally, one might ask, what about other embedded constructions in these languages? Does subject inversion occur elsewhere in Chishona or Kiswahili? Is there any additional evidence of verb raising in these languages or in Sesotho? Interestingly, the vast majority of embedded clauses in all three languages take SV word order and cooccur with a disyllabic embedding complementizer, as predicted. The exceptions are two: temporal clauses in Chishona appear with both multisyllabic and monosyllabic complementizers, with subject inversion occurring only with the latter (cf. the non-inverted order in (24)). The other case is that of subject relative clauses Kiswahili in and Sesotho, where the relative complementizer is monosyllabic and prefixes to the embedded verb (Ashton 1947, Barrett-Keach 1980, Demuth 1995). Although a postverbal subject does not occur in these constructions due to the fact that it has been extracted, it would appear that verb raising has taken place. Thus, the syntactic realization of other embedded complements in these Bantu languages provides additional support for the analysis of prosody-syntax interactions developed above.

!

5. Conclusion

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In conclusion, we have investigated two types of object relativization strategies in Bantu languages in which the prosodic status of the relative complementizer is correlated with verb raising and subsequent 'inversion' of the subject. In the first type, exemplified by Sesotho, the relative complementizer is an independent lexical item, and subject inversion is impossible. In

the second type, exemplified by Chishona, the relative complementizer is a prosodically dependent monosyllable which must cliticize to the embedded verb, resulting in verb raising to C^0 with the subject left behind. Confirmation that these two types of constructions are in complementary distribution comes from Kiswahili, where both SV and VS surface word orders are attested, each with the expected corresponding morpho-phononlogical properties of the relative complementizer.

We have argued that these data present a case of syntax constrained by prosody, where verb raising incurs a violation of the syntactic constraint STAY in order to satisfy the higher-ranked prosodic constraint MINPW. An alternative analysis of these data have been considered and found wanting. If movement of I^0 to C^0 in Bantu languages is analyzed as the same type of V2 construction found in Germanic languages, it provides no principled way of distinguishing Sesotho-type languages from Chishona-type languages, precisely because it makes no reference to prosody.

In sum, it would appear that the Bantu relativization facts argue against traditional derivational approaches to grammar that posited that 'syntax feeds the phonology' (Zwicky & Pullum 1986). Nor does it fit within more recent proposals, where the prosody selects between two equally good syntactic constructions, or where prosody plays a role where the syntax is indeterminent (Golston 1995). Rather, the analysis presented here, in which Prosody >> Syntax, provides support for a position more like that proposed by Zec & Inkelas (1990), where syntax-phonology interactions can be bidirectional. We suspect that an Optimality-theoretic perspective on language, which provides a useful framework for exploring interactions between different levels of grammatical structure, may help uncover many other cases where phonological

constraints dominate syntactic constraints - perhaps especially in the domain of determining word order.

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