TONE IN THE ǸKỌ̀RỌ́Ọ̀ RELATIVE CLAUSE CONSTRUCTION

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Abstract: Existing literature reveal that in African languages, restrictive relative clauses exhibit the most variation in the prosody-syntax interface. This paper provides a preliminary descriptive account of how tone plays a role in structuring information within the Nkọrọọ relative clause, specifically restrictive relatives that contain a transitive verb. The paper posits that in Nkọrọọ relative clause constructions, tonal changes indicate whether the argument in the relative clause is performing the action, as in 'the woman [that Tọnye saw] yawned', thus functioning as the agent, or whether the action is being performed on the argument in the relative clause, as in 'the woman [that saw Tọnye] yawned'. Agent role assignment is achieved by retaining the citation tones on the verb while raising the tone on the relative marker, **nà**. Tone raising on the relative marker applies only when the verb tone is non-low. Patient role assignment is achieved on the verb by both tone lowering and raising. The aim is to assign a specific high-downstepped-high tonal pattern on the verb, regardless of its citation form. Data collected illustrate the tone patterns of bisyllabic verbs. The findings further reveal that bisyllabic verbs in the language form a prosodic foot and provide the domain for tonal processes to be applied on the verb and the relative marker. Whereas in languages such as English, theta role assignment is conditioned by syntax (i.e. movement of constituents), in the Nkọrọọ relative clause, it is conditioned by prosody (i.e. tone).

Keywords: tone, relative clause, Nkọrọọ, Ijoid, prosody-syntax interface

TON DANS LA CLAUSE RELATIVE DE ǸKỌ̀RỌ́Ọ̀

Résumé: La littérature existante révèle que dans les langues africaines, les clauses relatives restrictives présentent les plus grandes variations dans l'interface prosody-syntaxe. Cet article fournit un compte rendu descriptif préliminaire de la façon dont le ton joue un rôle dans la structuration de l'information dans la clause relative Nkọrọọ, en particulier les parents restrictifs qui contiennent un verbe transitif. L'article postule que dans les constructions de clause relative Nkọrọọ, les changements tonaux indiquent si l'argument dans la clause relative effectue l'action, comme dans 'la femme [que Tọnye a vu] a bâillé', fonctionnant ainsi comme l'agent, ou si l'action est effectuée sur l'argument dans la clause relative, comme dans 'la femme [qui a vu Tọnye] a bâillé'. L'attribution du rôle d'agent est réalisée en conservant les tonalités de citation sur le verbe tout en élevant le ton sur le marqueur relatif, **nà**. Le ton qui monte sur le marqueur relatif ne s'applique que lorsque le ton du verbe n'est pas basse. L'attribution du rôle au patient est réalisée sur le verbe en abaissant et en élevant le ton. Le but est d'assigner un motif tonal haut-en-bas-haut spécifique sur le verbe, indépendamment de sa forme de citation. Les données recueillies illustrent la tonalité des verbes bisyllabiques. Les résultats révèlent en outre que les verbes bisyllabiques dans le langage forment un pied prosodique et fournissent le domaine pour les processus tonaux à appliquer sur le verbe et le marqueur relatif. Alors que dans les langues comme l'anglais, l'attribution de rôle thêta est conditionnée par la syntaxe (c'est-à-dire le mouvement des constituants), dans la clause relative de Nkọrọọ, il est conditionné par la prosodie (c'est-à-dire le ton).

Mots-clés : ton, clause relative, Nkọrọọ, Ijoid, l'interface prosodie-syntaxe

Introduction

A relative clause is a subordinate clause that performs the role of giving detailed information about a noun phrase, also known as the argument. Relative constructions involve the insertion of a relative clause in front of its noun phrase antecedent in a matrix clause and are usually introduced by relative markers. There are two types of relative clauses: restrictive and non-restrictive. A restrictive relative clause provides information that is necessary for the proper identification of the reference of the noun phrase it modifies, while a non-restrictive relative clause provides additional information about the common argument without being required for its identification (Dixon, 2010). Non-restrictive relative clauses usually function as appositives (Griffith, 2009). The relative clause typically uses some grammatical device to indicate that one of the arguments within the clause has the same referent as the noun phrase (argument) it modifies.

In African languages, which are mostly tonal, tone (as well as other units of prosody) plays a role in determining how the relative clause is structured or how certain information within the relative clause is structured. In other words, tone (or prosody) interacts with both the grammatical structure and the information structure of relative clauses. The manner in which this interaction is achieved varies from language to language and is thus language-specific. According to Downing et al. (2010), restrictive relative clauses exhibit the most variation in the prosody-syntax interface.

In Nkọrọọ (ISO code: nkx), an Eastern Ịjọ language spoken in the Niger Delta region of Nigeria, West Africa, tone helps in structuring meaning within the relative clause. With the aid of synchronic natural data, this paper provides a preliminary description of how tonal or prosodic information provide the cues for establishing the appropriate meaning within the relative clause and also how prosody marks the domain that is relevant for semantic representation.

1. Review of Related Literature

A relative clause is a subordinate clause that typically modifies a noun or noun phrase (Payne, 1997, Griffith, 2009). It is grammatically dependent on a main clause. In many languages of the world, relative clauses are introduced by relativizers or relative markers. Other languages may employ other methods such as a change in word order, tonal changes, a special morphological variant or a combination of more than one of these methods. In other words, the ways in which relative clauses are marked are usually language-specific. For African languages in particular, tone plays a vital role in both the grammatical structure and information structure of relative clauses as we shall see in the following subsections.

Tone is a suprasegmental feature that employs the pitch of the voice in signifying lexical and grammatical meanings. It can be used to mark "prosodic domains in the word, phrase or utterance and to distinguish between sentence types" (Hyman, 2013, p.24). Tone enters into grammatical relationships with the word and units larger than the word. Tonal domains therefore interact with other linguistic levels beyond phonology such as morphology, syntax and pragmatics giving rise to interface levels.

1.1. Tone and Relative Clause Constructions in some African Languages.

In this section, we shall examine the role tone plays in the relative clause constructions of some African languages as seen in the literature namely, Bemba, Ngas, and Asante Twi.

1.1.1. Tone in Bemba Relative Clause Constructions

In Bemba, a Bantu language spoken primarily in Zambia but also in Tanzania and the Democratic Republic of Congo, tone is central to the structure of relative clauses (Cheng & Kula, 2006, Kula & Marten, 2010). Restrictive and non-restrictive relative clauses are identified by different tone marking patterns on the relative clause and on the head noun. Head nouns of relative clauses bear a word-final high tone with restrictive relative clauses and word-final low tone with non-restrictive relative clauses as seen in the examples below. The head nouns are in bold type.

(1a) **abá-ntú**   ábá-ka-ís-a   bá-ka-fúm-a   ku-Lusaka

     2-people   REL.SM2-FUT-come-FV   SM2-FUT-come-FV   17-Lusaka

     'The people who will come will come from Lusaka'   (restrictive RC)

(b) **abá-ntu**   ábá-ka-ís-a   bá-ka-fúm-a   ku-Lusaka

     2-people   REL.SM2-FUT-come-FV   SM2-FUT-come-FV   17-Lusaka

     'The people, who will come, will come from Lusaka'   (non-restrictive RC)

(Kula & Marten, 2010, p.65)

1.1.2. Tone in Ngas Relative Clause Constructions

In Ngas (also called Angas), a Central West Chadic language spoken in Plateau State, Nigeria, the relative clause is introduced by a relative marker mÈ (as seen in example 2a) that follows the noun or noun phrase it modifies. Other relative markers in the language are **kòo** and **kòo-mÈ**. The relative marker is optional and may be omitted. However, when the relative marker is omitted, it obligatorily evokes a falling tone on the noun (cf. Example 2b) or the last element in the noun phrase that precedes it (cf. example 2c). Hence, a high tone becomes high-falling and a mid-tone becomes mid-falling (Ermisch, n.d.).

(2a) yàm   mÈ [pÒ   jì]   nyì   (*cf.* yàm 'child', 'son')

     child.REL   REL PROG V.come   POSTREL

     'This child that is coming'

(b) gÔ   [kè   mÉt]   Ãà   (*cf.* gÓ 'man')

     man.REL 3SG.PF   V.go   POSTREL

'The man who has gone'

(c)   kè   ní i   nêN   [wu   kàrèm] (*cf.* nêN, *var.* núN 'cow')

        3SG.PF   V.see   cow.REL 2PL.GA   V.slaughter

'He/She saw the cow that you slaugther'

<div align="center">(Jungraithmayr & Holubová, 2010 as cited in Ermisch, n.d., p.9)</div>

1.1.3. Tone in Asante Twi relative clause constructions

In Asante Twi, an Akan dialect belonging to the Kwa family of the Niger Congo phylum and spoken in Ghana, verbs and pronoun prefixes may undergo tonal changes in the relative clause. In example (3) below, the low tone on the first person singular pronoun **mì** is raised to a high tone when the relative marker **áà** is introduced, while in example (4), the low tone on the locative verb **wɔ̀** is raised to a high tone in a relativized sentence. We see that in Akan, tone raising on certain grammatical units is essential for the identification of relative clauses.

(3a) **Mì**-hú-ù   àbòfrá   'I saw a child'

       1SG-see-COMPL   child

(b)   àbòfrá áà   **mí**-hú-ù   nó   'A child that I saw'

      child   REL   1SG-see-COMPL   3SG

<div align="center">(Schachter, 1973, p.22–23, cited in McCracken, 2013, p.4)</div>

(4a) ɔ̀-**wɔ̀**   Ényìrésì   'S/he is in England'

       3SG-LOC   England

(b)   Kòfí   nà   ɔ̀ -**wɔ́**   Ényìrésì   'It's Kofi who is in England'

      Kofi   FOC 3SG-LOC   England

<div align="center">(Schachter & Fromkin, 1968, p.208–209, cited in McCracken, 2013, p.3–4)</div>

In each of the above languages cited, we observe that tone plays different roles in determining the grammatical and information structures of the relative clause. Word-final tone on the head noun of the relative clause distinguishes between restrictive and non-restrictive RCs in Bemba. Ngas employs both relative markers and post relative markers in the relative clause construction. The relative marker is optional but when the relative marker is omitted, tone functions as a relative marker. Lastly, in Asante Twi, relative clauses can be identified by raising the tone on certain grammatical units. These examples reveal that the role of tone in the relative clause constructions of African languages is multifaceted and varies from language to language.

1.2. Tone in Ǹkọ̀rọ́ọ̀

Called Kìrìkà by the speakers, Nkọrọọ is coordinate with the dialect cluster of Kalaḅarị, Iḅanị and Kịrịkẹ (Jenewari, 1989, Williamson and Blench, 2000). Nkọrọọ operates two level tones; high (H), phonetically marked with an acute accent [´] and low (L), phonetically marked with a grave accent [`] plus a downstepped high tone (D) phonetically marked by a downward arrow [↓] (Obikudo, 2013). These level tones contrast in lexical items as shown in the examples below.

HH vs HL

(5a)	ŋm̄gbá	'bone'		ŋm̄gbà	'oyster'
(b)	tɔ́rú	'river, sea'		tɔ́rù	'eye'

HH vs HD

(6a)	ókí	'accept, take, receive'		ó⁺kí	'swim'
(b)	kárá	'carve'		ká⁺rá	'be perfect'

HH vs LH

(7)	sáɓá	'spread, infect'		sàɓá	'cross over'

HH vs LL

(8a)	ówú	'cry', 'mask'		òwù	'fight'
(b)	órú	'deity, god'		òrù	'drink' (n)

LL vs HD

(9a)	òbù	'war'		ó⁺bú	'door'
(b)	òkù	'mortar'	ó⁺kú		'be heavy', 'louse'

LL vs HL

(10a)	kìrì	'slice'		kírì	'earth'
(b)	mùnɔ̀	'question marker'		múnɔ̀	'sleep'

In the examples above, tone distinguishes the meanings of lexical items. However, when words come together in larger grammatical units, such as phrases, clauses and sentences, tonal behaviour is not always predictable. This is because tone tends to act independently of the tone bearing unit.

Research previously done in Nkọrọọ reveal that nominal constructions impose a high-low tone pattern on their output regardless of the tone patterns of the input through a number of processes such as tone spreading, tone dissimilation, tone metathesis, etc. (Akinlabi, Connell & Obikudo, 2009). The phenomenon whereby words assign specific tonal patterns in certain domains is called tonosyntax (Heath & McPherson, 2013, p.265). Tonosyntax is found in Ịjọ (Harry & Hyman, 2012 describe same in Kalaḅarị) and also in Dogon languages spoken in Mali (Heath & McPherson, 2013). Interestingly, both language groups have a Subject-Object-Verb (SOV) basic word order. The assignment of specific tonal patterns in Nkọrọọ nominal constructions is evidence that there is a prosody-syntax or tone-syntax interface in the language.

2. Theoretical Framework

Beginning from Gruber (1965), linguists have attempted to devise a universal typology of the semantic roles played by arguments in relation to their predicates (Chomsky, 1986, Radford, 1988, 1997, Katamba, 1993, Haegeman, 1994). The Theta theory is concerned with how verbs assign thematic (semantic) roles to their arguments. Theta roles are essentially used to characterise transitivity by specifying the parts played by the arguments representing different participants in the action, state or process indicated by the verb. They include agent, theme or patient, experiencer, benefactive, goal and locative or location. This theory is relevant

to this work as the data sets show that the assignment of theta roles within the relative clause is not conditioned by syntax alone, that is, the verb but also by prosody, that is, tone.

The function of tone in tonal languages is not only lexical but also grammatical. In many African languages, tone has a heavier functional load in the grammar than in the lexicon (Loos et al., 2003). When tones enter into grammatical relationship with the word or units larger than the word, certain tone processes occur. Within the theory of Autosegmental Phonology (Goldsmith, 1976, 1990), tones are treated as autonomous from the sound segments that bear them. This is because they are capable of undergoing processes independent of their tone bearing units. The various articulatory processes that occur within this domain such as voicing, nasalisation, and aspiration are also autonomous (Katamba, 1989). However, the principles that regulate the relationship or linking between the autonomous tiers are not always universal. In discussing the autonomy of tone, Katamba (1989) observes that tones can survive either the deletion or loss of syllabicity of tone bearing units. He states that "tone shows a kind of stability which cannot be accounted for if it is assumed to be an integral part of the phonological segment on which it appears in the phonetic representation" (Katamba, 1989, p.194). Apart from tone stability, other features of tone that make the case for an autonomous treatment in autosegmental phonology include mobility, tonelessness, one-to-many mapping and many-to-one mapping. In the course of this study, we shall observe tonal behaviour within Nkɔrɔọ relative clause constructions.

3. Methodology

The data for the study were extracted from a corpus collected from a documentation project on the Nkɔrɔọ language and people[1]. Data collection methods included participant observation, oral interviews, and surveys. In the course of the project, data were gathered via conversations, procedurals, narratives, direct elicitation and other communicative events. The formats for data collection included audio, video, still pictures and text. The SIL Comparative African Wordlist (Snider & Roberts, 2006) and the Lingua Descriptive Studies Questionnaire developed by Bernard Comrie and Norval Smith (1977) were used to elicit lexical and grammatical data on the language.

4. Data Analysis and Interpretation

In this section, we present data that describe the structure of the Nkɔrɔọ relative clause construction and discuss tonal interactions within this syntactic domain.

4.1. The Nkɔrɔọ Relative Clause and Tone

Nkɔrɔọ is a verb-final language, thus it has a Subject-Object-Verb (SOV) word order. SOV languages have a strong tendency to place relative markers at the end of relative clauses. It is also typical for the restrictive relative clause to precede the main clause in SOV languages thus functioning as a prenominal modifier, as is the case in Bambara (Kastenholz, 1998 as cited in Ermisch, n.d.) and Turkish (Payne, 1997).

Nkọrọọ employs the presence of a relative marker (also called a complementizer or subordinating conjunction) although word order and tone do have their roles in specifying certain aspects of relative clauses. The relative clause is primarily identified by the relative marker, a low toned monosyllabic morpheme, **nà** that is obligatory and occurs at the end of the relative clause. The usual word order in the Nkọrọọ relative clause is for the verb of the main clause to occur in sentence-final position, that is, the main clause retains the canonical SOV word order, while the relative clause precedes the noun or noun phrase that it modifies.

	S	O		V
(11a)	ì	jé	⁺ḿ	ɓèènì
	1SG	thing	the	believe

'I believed the thing (it)'

	S			O	O	V	V
(b)	jè	[á	fíé	⁺ná]	jé	⁺ḿ	ɓèènì
	1SG	3FSG	say	REL	thing	the	believe

'I believed the thing [that she said]'

In example (11b), the relative clause which is represented in square brackets is embedded within the main clause and occurs immediately after the subject of the main clause. Note that in Nkọrọọ, the forms of the first and second persons singular pronouns vary depending on if the following morpheme begins with a consonant, syllabic nasal or vowel (Obikudo, 2013). The word order of the main clause is SOV (cf. 11a). A change in this order can be brought about by fronting the verb of the main clause to the beginning of the relative clause so that the main clause changes from SOV to SVO (cf. example 12).

	S	V				O		
(12)	ì	ɓèènì	[á	fíé	⁺ná]	jé	⁺ḿ	
	1SG	believe	3FSG	say	REL	thing	the	

'I believed the thing [that she said]'

We observe in examples (11 & 12) that the relative marker nà is immediately preceded by the verb of the relative clause. Also, the tone of the relative marker is raised to a downstepped high tone. Additional data reveal that the tone on the relative marker varies depending on the tone of the preceding syllable; it retains its inherent low tone after a low tone but becomes downstepped after a high tone as observed in examples 13, 14 & 15 respectively.

(13)	mí	ì	fàm̀	nà	ígbá	ḿ
	this	1SG	beat	REL	drum	the

'This is the drum that I beat'

(14)	má	ì	fɛ́	⁺ná	dʒírí	má
	these	1SG	buy	REL	book	PL

'These are the books that I bought'

| (15) | mí | ì | pí⁺ká | ⁺ná | wárì | ḿ |

| this | 1SG | build | REL | house | the |

'This is the house that I built'

The change in the tone of **nà** in examples (14) & (15) can be attributed to high tone spreading from the preceding syllable. However, the differences in pitch can be explained by tone stability, a case where the inherent low tone on the relative marker is delinked from its tone bearing unit but remains underlying without associating with any syllable. This floating low tone causes the pitch of the high tone that spreads to the relative marker to be lower than the high on the preceding syllable of the last vowel of the verb.

Furthermore, when the verb of the RC lacks an object (either because it is intransitive or its valency has been decreased), the relative marker retains its low tone (cf. 16 & 17).

(16)	ì	nàà	nà	ámájínáówèì	ḿ	fì-sùkù
	1SG	hear	REL	king		the	die-PERF

'I hear that the king has died'

(17)	ì	dʒírí	nà	ámájínáówèì	ḿ	fì-sùkù
	1SG	know	REL	king		the	die-PERF

'I know that the king has died'

The hypothesis here is that there is a relationship between tone, transitivity and theta role assignment that plays out on the tone of the verb of the RC and the relative marker. Additional data reveal that within the restrictive RC, where the RC contains a transitive verb, the tone of the verb in the RC changes to indicate whether the argument in the RC is performing the action or whether the action is being performed on the argument. If the action is being performed by the argument in the RC, that is performing the role of agent, the tone of the verb takes on its citation form. If the action is being performed on the argument in the RC, that is performing the role of patient, the verb takes on a high-downstepped-high tonal pattern. The tone of the verb in the main clause remains unchanged. The word order in both circumstances also remains unchanged. The RC precedes the main clause in each case. This will be illustrated with bisyllabic verbs with HH, LL and HD tone patterns in the RC. The RC is presented in bold type.

High tone bisyllabic verb: órí 'see'

(18a)	tɔ́ɲé	íríárà	ḿ	òrí
	PN	woman the	see

'Tọnye saw the woman'

(b)	íríárà	ḿ	tɔ́ɲé	òrí
	woman the	PN	see

'The woman saw Tọnye'

(c)	**tɔ́ɲé**	**órí**	**⁺ná**	íríàrà	ḿ
	PN	see	REL	woman the

'The woman **that Tọnye saw**'

(d)	**tɔ́ɲé**	**ó⁺rí**	**ná**	íríàrà	ḿ
	PN	see	REL	woman the

'The woman **that saw Tọnye**'

Low tone bisyllabic verb: fàm̀ 'flog, beat'

(19a) tɔ́ɲé   tɔ̀kú   m̀   fàm̀

      PN   child   the   flog

      'Tọnye flogged the child'

(b)   tɔ̀kú   m̀   tɔ́ɲé   fàm̀

      child   the   PN   flog

      'The child flogged Tọnye'

(c)   **tɔ́ɲé**   **fàm̀ nà** tɔ́kù   m̀

      PN   flog REL   child   the

      'The child **that Tọnye flogged**'

(d)   **tɔ́ɲé**   **fá⁺m̀ ná**   tɔ́kù   m̀

      PN   flog   REL   child   the

      'The child **that flogged Tọnye**'

Dowstepped high bisyllabic verb: sɛ́⁺kɛ́ 'carry'

(20a) tɔ́ɲé   àmàòwèì   m̀   sɛ̀kɛ́
      PN   man   the   carry

      'Tọnye carried the man'

(b)   àmàòwèì   m̀   tɔ́ɲé   sɛ̀kɛ́

      man   the   PN   carry

      'The man carried Tọnye'

(c)   **tɔ́ɲé**   **sɛ́⁺kɛ́**   **⁺ná**   àmàòwèì   m̀

      PN   carry   REL   man   the

      'The man **that Tọnye carried**'

(d)   **tɔ́ɲé**   **sɛ́⁺kɛ́**   **ná**   àmàòwèì   m̀

      PN   carry   REL   man   the

      'The man **that carried Tọnye**'

      The data in the (a) and (b) examples of (18 – 20), show that in Nkọrọọ sentence constructions, the theta roles of agent and patient are assigned by moving constituents to the subject and object positions respectively in the sentence. The (c) and (d) examples of (18 – 20) reveal that within the RC, tone and not movement is responsible for this semantic interpretation. In examples (18c), (19c) and (20c), when the argument in the RC, Tọnye, acts as agent, thus performing the actions specified by the verbs, **órí** 'see', **fàm̀** 'flog, beat', and **sɛ́⁺kɛ́** 'carry' respectively, the citation tones of the verbs are retained. The tone of the relative marker **nà** remains low after the low tone verb **fàm̀** 'flog, beat' but is raised to a downstepped high after the preceding high tones on the verbs **órí** 'see' and **sɛ́⁺kɛ́** 'carry'.

On the other hand, in examples (18d), (19d) and (20d), the actions specified by the verbs are being performed on Tǫnye, who acts as patient. The tone of the last syllable of the high tone verb **órí** 'see' is lowered to a downstepped high while all the tones of the low tone verb **fàm̀** 'flog, beat' are raised to acquire a high-downstepped-high tonal pattern. The verb **sɛ́⁺kɛ́** 'carry' retains its high-downstepped-high tonal pattern. The low tone of the relative marker is raised in all cases. The tones of the utterances in examples (20c & d) are auditorily perceived to be the same regardless of whether it is the argumant carrying out the action or the action is being performed on the argument in the RC. This is probably due to the fact that the relative pitch on a high and a downstepped high are minimally contrastive.

5. Results and Discussion

From the sets of data presented in the previous sections, it is observed that the restrictive relative clause precedes the main clause and so functions as a prenominal modifier. The word order of the RC is subject followed by the verb, and then the relative marker (that is, SVREL). This order remains unchanged. The prosodic information provided by tonal changes within the RC indicate whether the argument in the RC is performing the role of agent or patient. Agent role assignment is achieved by retaining the citation tones on the verb while raising the tone on the relative marker. This applies only when the verb tone is non-low. Patient role assignment is achieved on the verb by both tone lowering and raising, as the case may be. The aim is to assign a specific high-downstepped-high tonal pattern on the verb, regardless of its citation form. So, **órí** 'see' becomes **ó⁺rí**, **fàm̀** 'flog, beat' becomes **fá⁺m̀** and **sɛ́⁺kɛ́** 'carry' remains unchanged. The tone of the relative marker is also raised. Here, I observe a case of tonosyntax, an overlay of tones in a specific syntactic domain, employed to assign semantic roles within the RC. Whereas in languages such as English, theta role assignment is indicated by syntactic processes via the movement of constituents, in the Nkǫrǫǫ RC, this is indicated by phonological processes via tone lowering and raising.

In order to ascertain the domain for the application of the tonal processes, I propose that the bisyllabic verb in the relative clause (and in the language) constitutes a prosodic foot[2], the foot being a category of sound organization (Akinlabi & Urua, 2022). According to Green (2015), prosodic feet characteristically:

a) provide a domain for the application of some processes to or not to occur,

b) define a domain for the occurrence or non-occurrence of only certain tones, segments or sequences,

c) define the distribution of metrical and phonological prominences.

It has been observed that Nkǫrǫǫ imperative verb forms are derived via tone lowering and high tone monosyllabic verbs are lenghtened to become bisyllabic in the imperative form (Obikudo, 2013). The lengthened vowel takes a low tone (cf. 21a & b). This implies that the monosyllabic verb has to be bisyllabic before the imperative tone rule can be applied, ascertaining that the bisyllabic verb root constitutes a prosodic foot.

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2 An earlier version of this paper was presented at the 30th West African Languages Congress and 10th Linguistics Association of Ghana (LAG) Conference held at the University of Education, Winneba, Ghana. I am grateful to Prof. Firmin Ahoua who suggested that the tonal changes in the RC may be due to prosody.

21a)	ɓó	'come'		ɓóò	'come!'
(b)	fí	'eat'		fíì	'eat!'

The domain of the bisyllabic verb in the RC is thus the trigger for the application of these tonal alternations.

Conclusion

I have discussed how tonal or prosodic information provide the cues for establishing the appropriate meaning within the Nkọrọọ RC by assigning the roles of agent and patient to the argument in the RC via tone. I have also described how tone marks the syntactic domain that is relevant for this semantic representation. The data sets above reveal that there is a prosody-syntax interface evidenced by tonal behaviour within syntactic domains, specifically the relative clause.

The findings of the study posit that the restrictive RC precedes the main clause and that the relative marker is a low toned monosyllabic morpheme **nà** which occurs in clause-final position. Bisyllabic verbs in the language form a prosodic foot and provide the domain for tonal processes to be applied on the verb and the relative marker. These tonal applications are employed to assign the theta roles of agent and patient to the argument within the RC. Verbs are known to assign semantic roles to their arguments via syntactic processes (that is, movement of constituents), as seen in the examples (18 a & b, 19a & b, 20a & b). However, this study reveals that within the Nkọrọọ RC, tone is rather employed to achieve the same interpretation. Thus, the study provides evidence for further research on the role of tone within the relative clause and in Theta role assignment.

Abbreviations

1, 2, 3	first, second or third person pronoun
COMPL	complementizer
D	downstepped high tone
F	feminine
FUT	future
FV	final vowel
GA	Grundaspekt
H	high tone
HAB	habitual
L	low tone
LOC	locative
O	object
PF	perfective aspect
PL	plural
PN	personal name
POSTREL	post relative marker
PROG	progressive

REL	relative marker
RC	relative clause
S	subject
SG	singular
SM	subject marker
V	verb

References

AKINLABI Akinbiyi & Eno E. Urua, 2002, «Foot structure in the Ibibio verb», Journal of African Languages and Linguistics, 23, p. 119–160.

AKINLABI Akinbiyi, Bruce Connell, & Ebitare Obikudo, 2009, «The Tonal Structure of Nkọrọọ Nominal Constructions» In Urua, Eno-Abasi, Moses Ekpeyong and Firmin Ahoua (eds.). Language Development Beyond Borders, p. 447–466. Uyo, Ensel Publishers.

CHENG, Lisa and Nancy Kula, 2006, «Syntactic and phonological phrasing in Bemba relatives», ZAS Papers in Linguistics, 43, p. 31–54.

CHENG, Lisa and Laura J. Downing, 2007, «The prosody and syntax of Zulu relative clauses», SOAS Working Papers in Linguistics, 15, p. 51–63.

CHOMSKY, Noam, 1986, Knowledge of Language: Its Nature, Origin and Use, New York, Praeger.

CINQUE, Guglielmo, 2013, Typological Studies: Word Order and Relative Clauses, New York and Oxon, Routledge.

COMRIE, Bernard & Norval Smith, 1977, «Lingua descriptive studies: questionnaire», Lingua, 42, p. 1–72.

DIXON, Richard M. W, 2010, Basic Linguistic Theory, Volume 2, Grammatical Topics,

Oxford/New York, Oxford University Press.

DOWNING, Laura J., Annie Rialland, Cédric Patin and Kristina Riedel, 2010, «Introduction» In Downing, Laura J., Annie Rialland, Jean-Marc Beltzung, Sophie Manus, Cédric Patin, and Kristina Riedel (eds.). Papers from the Workshop on Bantu Relative Clauses, ZAS Papers in Linguistics, 53, p. 1– 6.

ERMISCH, Sonja, n.d., Relative constructions in African languages, Available online at Relative Constructions in African Languages Warschau.pdf (uni-frankfurt.de).

GOLDSMITH, John A, 1976, Autosegmental Phonology, Cambridge, MA, MIT dissertation.

GOLDSMITH, John A, 1990, Autosegmental and Metrical Phonology, Oxford, Basil Blackwell.

GREEN, Christopher R, 2015, «The foot domain in Bambara», Language 91, 1, p. e1–e26. Linguistic Society of America. Available online at

http://muse.jhu.edu/journals/lan/summary/v091/91.1.green.html.

GRIFFITH, Theresa, 2009, Exploring Syntax: The Basics, California, Kendall Hunt Publishing Company.

Gruber, Jeffrey S, 1965, Studies in lexical relations, MIT doctoral dissertation.

HAEGEMAN Lilian, 1994, Introduction to Government and Binding Theory, Oxford, Basil Blackwell.

HARRY, Otelemate & Larry Hyman, 2012, «Construction tonology: the case of Kalabari», UC Berkeley Phonology Lab Annual Report, p. 231–244.

HEATH, Jeffrey & Laura McPherson, 2013, «Tonosyntax and reference restriction in Dogon Nps», Language 89, 2, p. 265–296. Linguistic Society of America.

HYMAN, Larry M, 2003, «Issues in the phonology-morphology interface in African languages» In Ọlanikẹ Ọla Orie and Karen W. Sanders (eds.). Selected proceedings of the 43rd Annual Conference on African Linguistics: Linguistic Interfaces in African languages, p. 16–25. Somerville, MA, Cascadilla Proceedings Project.   www.lingref.com, document #2952.

JUNGRAITHMAYR, Herrmann & Miroslava Holubová, 2010, ms. The Ngas language:

Grammatical outline, dictionary, texts.

KATAMBA, Francis, 1989, An Introduction to Phonology. London and New York: Longman.

KATAMBA, Francis, 1993, Morphology, Basingstoke, Macmillian Press Limited.

KASTENHOLZ, Raimund, 1998, Grundkurs Bambara (Manding) mit Texten, Cologne, Rüdiger Köppe.

KULA, Nancy C. & Lutz Marten, 2010, «The prosody of Bemba relative clauses: A case study of the syntax-phonology interface in Dynamic Syntax» In Kempson, Ruth, Eleni Gregoromichelaki & Christine Howes (eds.). The Dynamics of Lexical   Interfaces, p. 57–86, Stanford, CA, CSLI Publications.

LEBEN, William R. 1973, Suprasegmental Phonology, Cambridge, MA, MIT dissertation.

LOOS, Eugene E., Susan Anderson, Dwight H. Day Jr., Paul C. Jordan, J. Douglas Wingate (eds.), 2003, Glossary of Linguistic Terms, LinguaLinks Library, Version 5.0, SIL International.

McCRACKEN, Chelsea, 2013, «Relative clauses in Asante Twi», Rice Working Papers in

Linguistics, 4, p. 1–28.

MTENJE, Al, 2011, «On relative clauses and prosodic phrasing in Ciwandya», ZAS Papers in Linguistics, 55, p. 121–139.

OBIKUDO, Ebitare F., 2013, A grammar of Ǹkọ̀rọ́ọ̀ (Kìrìkà), PhD thesis, University of Port Harcourt.

PAYNE, Thomas E., 1997, Describing Morphosyntax: A Guide for Field Linguists,

Cambridge, Cambridge University Press.

RADFORD, Andrew, 1988, Transformational Grammar, Cambridge, Cambridge University Press.

RADFORD, Andrew, 1997, Syntax: A Minimalist Introduction, Cambridge, Cambridge

University Press.

SCHACHTER, Paul, 1973, «Focus and relativization», Language 49, 1 p. 19–46.

SNIDER, Keith L. & James S. Roberts, 2006, «SIL comparative African wordlist», SIL Electronic Working Papers, 2006-005.

ZERBIAN, Sabine, 2010, «The relative clause and its tones in Tswana», ZAS Papers in Linguistics, 53, p. 227–242.