THE ACQUISITION OF SYNTACTIC TONE: THE CASE OF CHICHEWA NEGATION

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1.0 Introduction

While it still may be true ten years later that "the study of the acquisition of tone by children learning their first language is in its infancy"[1], some progress has been made in answering systematically at least some of the questions Li and Thompson asked[2]. The study of tone has progressed admirably since the inception of autosegmental phonology in the mid-1970s. Studies on tone in African languages[3] have provided insightful accounts of complex tonal phenomena and have helped in constructing theoretical models with considerable explanatory power to handle a wide range of tone systems in the adult language. This progress in the study of adult tone systems has also helped the study of the acquisition of tone by children. This is particularly important because a thorough knowledge of the adult system helps us to systematically analyze the strategies the child uses to learn that system, and to understand the points of deviation from and subsequent adoption of that adult system.

Li and Thompson[4] recognized the role of tone in the syntax of many African languages, and it is precisely the questions on the chronology of acquisition, deviations from the adult norm, and tone rules that this paper hopes to provide at least some data and some tentative answers to:

I. Chronology of acquisition
   A. What is the relationship between the time when the child has mastered the tone system and the time when E has mastered the segmental system of E's language? . . .

II. Deviations from the adult norm
   A. What range of substitutions do children make for tones which they have not yet mastered or acquired which occur in the adult language? . .

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IV. Tone rules

A. What are the differences in the child's output before, during, and after a tone rule is acquired?

B. At what stage of the acquisitional process are tone rules acquired?

Chimombo's[5] study revealed an interesting apparent parallel between the acquisition of tone rules and the acquisition of morphology, the sequence of stages of which appeared to parallel those described by Slobin for morphology:

> (1) no marking, (2) appropriate marking in limited cases, (3) overgeneralization of marking (often accompanied by redundant marking), (4) full adult system.[6]

The full adult system was not yet acquired by any of the children (studied up to the age of 2:6), but some evidence was found for each of the first three stages. However, a subsequent study by Chimombo and Mtenje (1989)[11] revealed that the interaction between tone, syntax, and semantics was considerably more complex, hence the current study, which comprehensively reanalyzes the tone data while not ignoring the syntactic and semantic information necessary for an accurate interpretation.

It is shown in the current study that children learning tone patterns and tone rules in the various Chichewa negative forms acquire these independently of the morpho-syntactic and phonological structure of the forms over which they are superimposed. This observation is then shown to provide further support for the general claim of autosegmental theory which recognizes the autonomy of tone in relation to the tone-bearing phonological units.

1.1. The Morphological Structure of the Chichewa Verb and Tone

Chichewa, like many other Bantu languages, shows the following morphological structure in the verb in its most complex form:

(1) negative prefix - subject prefix - aspectual marker - tense prefix - aspectual marker - object prefix - verb root - extension - final vowel

The structure in (1) is illustrated in the example given below in (2):

(2) si -ndi -ka -na -ngo -mu -pit -ir - a
neg-I -would -past -just -him -go -dative -final vowel
"I would not just have gone for him"

Note that Chichewa has two level tones, high (H) and low (L). Contour tones are also attested, but only as a combination of two level tones. Thus a low tone and a high tone on one vowel represent a rising tone (LH), while the reverse sequence (HL) yields a falling tone. In this paper, ´ represents a high tone, ˇ a rising tone, ˆ a falling tone, and low tones are unmarked. Verbs generally fall into two major tone groups, namely those which are low-toned on all syllables of the root (low-tone verbs) and those which carry high tones on the last two syllables of the root (high-tone verbs).

Mtenje[8] has presented a detailed analysis which shows that some of the morphological elements in (1) trigger interesting tone alternations. Particularly, the analysis shows that tense, negative, and object markers assign high tones to various domains of the verbal unit, most notably the first syllable, the syllable immediately to the right of the tense prefix, and the penultimate syllable. The three positions in which H tone assignment is induced by morphological markers are illustrated in the following affirmative examples, using the low-tone verb werenga ("read"):

(3)	subject marker	-tense marker	-verb root-final vowel
(3a)	ndi "I read recently"	-na	-wéreng -a
(3b)	ndí I "I read regularly (habitually)"	-ma -present habitual	-weréng -a - read

In (3a), the recent past tense prefix assigns a H tone to the syllable immediately to its right, while in (3b) the present habitual tense prefix places a H on the first syllable in the verb phrase as well as on the penultimate syllable. Similar tone assignment processes occur when the verb takes a negative marker, as illustrated in (4):

(4a) ndí -dzá -wéreng -a (affirmative)
"I shall read"

(4b) si ndi -dza -weréng -a (negative)
not -I -future -read
"I shall not read"

(4c) ndi -ná -wéreng -a (affirmative)
I -past -read
"I read some time ago"

(4d) sí -ndí -na -weréng -e (negative)
not -I -past -read
"I did not read"

Here the negative marker places a H on the penultimate syllable in (4b) while in (4d) it places the H on both the initial and penultimate syllables of the verb phrase. The H on the first root vowel of (4c) and that on the second syllable of (4d) result from an independent rule of tone-doubling which copies a H one syllable to its right under certain conditions. The two conditions relevant to this study under which tone doubling occurs are: (1) The H is doubled when a vowel is followed by at least a foot (as in (4c) and (4d) above): (2) The H is doubled in the negative subjunctive form of a monosyllabic verb (as in (14c) below).

1.1.1 Semantic Categories of Chichewa Negation: Definitions

1.1.1.1 Rejection

> Some object or action or happening either exists in the context or is imminent or about to exist in the context, and is opposed by the child.[9]

Rejection is signalled by the negative indicative in Chichewa, normally with the verb *funa* in either the present progressive or the reduced present progressive tense. The former is formed as follows:

(5)

affirmative	negative
ndi -ku -fúna	sí -ndí -ku -fúna
I -prog -want	not -I -prog -want
"I want"	"I don't want"

The tone pattern in the above affirmative verb, which is underlyingly low-toned, is LHL. The tense marker, *-ku -*, has the effect of assigning a H tone to the following syllable. In the negative verbs, the tone pattern is HLHL.

The reduced form is as follows:

(6a)	a -fúna	s -á -funa[10]
	he -want	not -he -want
	"he wants"	"he doesn't want"
(6b)	u -fúna	s -ú -funa
	you sg-want	not -you -want
	"you want"	"you don't want"

The affirmative verb takes a LHL pattern, like the full present progressive form, while the negative takes a HL pattern.

1.1.1.2 Nonoccurrence

An action event does not occur.[11]

In Chichewa, nonoccurrence is signalled in one of two ways: either by a variety of equivalents of the English "can't," which none of the children attempted in the course of the present study, so they will not be described here, or by the negative indicative of a number of tenses, including the present progressive as described above, the present habitual, the immediate future, the past simple, and the perfective. Examples illustrating tone realizations in these verb forms are given below. The verbs *luma* and *seweletsa* are both underlyingly low-toned. First, the present habitual takes the following forms:

(7a)	chí -ma -lúma	sí -chí -(má) -luma
	it -hab -bite-with	not -I -hab -bite
	"It bites"	"I doesn't bite"
(7b)	ndí -ma -seweléetsa	sí -ndí -má -seweletsa
	I -past-play-with	not -I -past-play-with
	"I play with (it)"	"I don't play with (it)"

In the affirmative the tone pattern is HLHL, while in the negative the pattern is HL. Note that in the negative form the tense/aspect marker is optional, making it identical to the reduced present progressive.

The immediate future is distinguishable from the reduced present progressive by tone pattern only, as is seen below:

(8a)	chí -luma	si -chi -lúma

	it -bite	not -it -bite
	"It's going to bite"	"it's not going to bite"
(8b)	ndí -seweletsa	si -ndi -sewelétsa
	I -play-with	not -I -play-with
	"I'm going to play with(it)"	"I'm not going to play with (it)"
(8c)	ndí -gwa	si -ndí -gwá
	I -fall	not -I -fall
	"I'm going to fall"	"I'm not going to fall"

Note that this tense, like the reduced present progressive, is not morphologically marked by any tense prefix. In the affirmative, the tone pattern is HL. In the negative forms, a H is placed on the penultimate syllable only, thereby creating a LHL pattern (8a-b), except with a monosyllabic verb root, in which case the pattern is LH (8c).

In the past simple, the forms are as follows:

(9a)	ndi -ná -luma	sí -ndí-na -lúme
	I -past-bite	not -I -past-bite
	"I bit"	"I didn't bite"
(9b)	ndi -ná -séweletsa	sí -ndí -na -sewélétse
	I -past-play-with	not -it -past-play-with
	"I played with (it)"	"I did'nt play with (it)"

Here we see that tone pattern in the affirmative forms is LHL, while the negative forms take a HLHL pattern, with the second H placed on the penultimate syllable.

The perfective negative is morphologically identical to that of the past simple, being distinguished from it by tone alone, as can be seen in the following examples:

(10a)	ch - a -luma	si -chi - na -lúme
	it -perf-bite	not -it -perf-bite
	"It has bitten"	"It hasn't bitten"
(10b)	ndi -na -seweletsa	si -ndi -na -sewelétse
	I -perf-play-with	not -it -perf-play-with
	"I've played with (it)"	"I've not played with (it)"

The affirmative perfective forms are low-toned throughout, while the negative forms have a H tone on the penultimate syllable, yielding a LHL pattern.

1.1.1.3 Not-knowing

The category of not-knowing includes such stative verbs as "know," "understand," and "think".[12] In Chichewa, however, there are two ways of signalling not-knowing. There is first, a single-morpheme response having the meaning "I don't know," *kaya* which takes one of two tone patterns: either L or LH. Secondly, thee are the negative indicative forms of the verbs *dziwa* ("know"), *va* ("understand"), and *ganiza* ("think"). The tone patterns for the present progressive tense have already been given, but are repeated here for the appropriate verbs:

(11a)	ndi -ku -mva	sí -ndí -ku -mva
	I -prog-hear	not -I -prog-hear
	"I understand"	"I don't understand"
(11b)	a -ku -dźiwa	s -a -ku -dźiwa
	he -prog-know	not -he -prog-know
	"he knows"	"he doesn't know"

Note the pattern of (11a) for a monosyllabic verb root.

The affirmative and negative tone patterns for the past habitual are as follows:

(12a)	ndi -má -mvá	sí -ndí -ma -mvá
	I -past-hab	not -past hab -hear
	"I used to hear"	"I never used to understand"
(12b)	a -ma -dźiwa	s -á -ma -dźiwa
	he -past hab	not -he -past hab -know
	"he knew"	"he didn't know"

Thus, on a monosyllabic verb the affirmative pattern is LH while the negative is HLH, and on a polysyllabic verb the affirmative is LHL while the negative is HLHL.

1.1.1.4 Prohibition

> A prohibition means (1) a positive command to not thus: **you must** (positive) **not-take that** (negative); and (2) the negative of a permission: **you-may-not** (negative) **take** (positive) **that.**[13]

Chichewa distinguishes formally between these two types of prohibition: negative command and negative permission (cf. Harding 1966). Prohibition of both kinds is signalled by the negative imperative prefix *-sa* -, but with differences in the imperative and subjenctive verb forms, the former signalling negative command and the latter negative permission.

1.1.1.4.1 Negative Command

> A negative command conveys the information that an act is permanently forbidden by authority, either before or after it has started.[14]

Imperatives in the affirmative take the form of the verb root, that is, they do not take a subject marker. Thus, with the exception of monosyllabic verbs, which take the vowel */i/* before the root,[15] affirmative imperatives appear in the base form with the final indicative vowel *-a*. When imperatives are negated, the dummy subject marker *o-* and the negative marker *-sa-* are prefixed to the base form:

(13a)	ononga	ó -sa -onónga
	spoil	you -not -spoil
	"spoil (it)"	"don't spoil (it)"
(13b)	taya	ó -sa -táya
	throw-away	you -not -throw away
	"throw (it) away"	"don't throw it away"
(13c)	i -dya	ó -sa -dýa
	(vowel) -eat	you -not -eat
	"eat"	"don't eat"

As can be seen, the negative forms take a HLHL pattern, except for monosyllabic verb roots, which take a HLH pattern.

1.1.1.4.2 Negative Permission

> Negative permission can signal one of three meanings: (1) It is a negative response to another's request to be allowed to do or have something, which the child implies (without stating) that he does not want that person to do or have . . . (2) It is a negative reaction to another's action (not a commanding action as in rejection) . . . (3) It indicates fear of an action, or the desire to prevent it.[16]

In Chichewa negative permission is signalled by the same invariant negative marker - *sa* - as for negative command, but allowing the full range of subject markers prefixed to the verb, which takes the subjunctive vowel suffix *-e* instead of *-a*:

(14a)	u -onónga -é	u -sa -ononga -e
	you sg-spoil -subj	you sg-not -spoil -subj
	"you should spoil (it)"	"You shouldn't spoil (it)"
(14b)	a -nén -é	a -sa -nén -e
	he -say -subj	he -not -say -subj
	"he should say (it)"	"he shouldn't say (it)"
(14c)	mú -dy -é	mu - sá - dy - é
	you pl - eat -subj	you pl - not -eat -subj
	"you should eat"	"you shouldn't eat"

Notice that the tone pattern for the affirmative subjunctive is LH, with the exception of monosyllabic verb roots which take H throughout (the reverse of the affirmative imperative). For the negative subjunctive, the tone pattern is LHL, again with the exception of monosyllabic verb roots whose pattern is LH.

1.1.1.5 Nonexistence

> Some object does not exist in the context or the child does not see it in the context, but there is some reason to expect it to be there or to look for it.[17]

Those utterances signalling both nonpresence and nonexistence were coded as signalling nonexistence for the purposes of this study.

In Chichewa, nonexistence is signalled by a negative suffix *-be* which is unique to the dynamic copula *-li-*.[18] The dynamic copula takes a locative prefix: *ku-*, *mu-*, or *par-*. Both the locative prefix and the verb root are underlyingly low-toned:

(15a)	ku -li	ku -lí -be
	at/to -be	at/to -be -without
	"there is"	"there isn't"
(15b)	mu -li	pa -lí -be
	in -be	in -be -without
	"there is"	"there isn't"
(15c)	pa -li	mu -lí -be
	on -be	in -be without
	"there is"	"there isn't"

As can be seen, the affirmative forms take a L tone pattern, while the negative ones take a LHL pattern, the attachment of the negative suffix *-be* triggering the assignment of the H to the verb root *-li-*. An alternative affirmative form combines the subject marker with the dynamic copula and a locative suffix, but having the same negative forms as (15):

(16a)	chi -li -ko	(16b) chi -li -mo
	It -be -at/to	it -be -in
	"there is"	"there is"
(16c)	chi -li -po	
	it -be -on	
	"there is"	

The same negative suffix *-be* is also used in conjunction with the dynamic copula to signal nonpossession, another subcategory of nonexistence, in which case a subject marker is prefixed instead of a locative maker:

(17a)	ndi -li ndí	ndi -lí -be
	I -be with	I -be -without
	"I have"	"I don't have"
(17b)	u -li ndí	ndi -lí -be
	I -be with	I -be -without
	"I have"	"I don't have"

Notice that the affirmative here takes a LH tone pattern, while the negative takes the same LHL pattern as for the locative forms discussed above.

1.1.1.6 Denial

> In denial events, children are negating the truth of a statement made by someone else.[19]

Chichewa has a negative stative copula *si* which is the negative counterpart of the affirmative *ndi* to signal denial:

(18a)	ndi nyumba is house "it's a house"	sí nyumba not -house "it's not a house"
(18b)	ndi nthochi is banana "it's a banana"	sí nthochi not banana "it's not a banana"

Thus the low-toned affirmative stative copula changes to a high-toned negative, which has the same base form as the negative indicative marker, but unlike the latter remains invariant as a free morpheme.

There are also other forms which may be used to express denial, apart from the negative stative copula. These are the various negative indicative forms discussed under rejection, nonoccurrence, and not-knowing. The relevant tenses the children used to signal denial in the present study are the reduced present progressive, the immediate future, and the perfective.

1.1.1.7 Cessation and Disappearance

Since only one utterance was recorded in the category of cessation, in the present progressive tense, produced with the correct tone pattern by C at 2:2.30, and none was recorded in the category of disappearance, these categories are not discussed. Furthermore, the tenses used to signal these two categories are the indicative tenses discussed under rejection, nonoccurrence, and not-knowing. The lack of utterances expressing cessation and disappearance is probably due to the fact that only those which normally have a syntactic negative marker were analyzed in the present study, not those which are overtly affirmative but with negative meaning (such as "stop").

2.0 Method

A total of 818 negative utterances were extracted from audio-recordings of two monolingual girls (A and B) and one proto-bilingual boy (C) between the ages of 1:3.2 and 2:6.9. The first child, A, was audio-recorded for six hours between the ages of 1:8.5 and 2:0.5 by her aunt, who was at the time a student at the University of Malawi. A is the third-born child, having two brothers, two and four years older than herself. A's mother is a secretary and her father a civil servant. A is a lively child and a total of 103 negative utterances were recorded in the course of the six hours.

The second child, B, was audio-recorded for eight hours between the ages of 1:6.24 and 1:9.18 by a research assistant who is a friend of the family. She is the second-born child, having a sister four years older than herself. B's mother is a nurse tutor and her father a university lecturer. B was not very talkative, and only 32 negative utterances were recorded in the course of the eight hours.

The third child, C, was audio-recorded for a total of 30 hours from the age of 1:3.2 to 2:6.9 by one of the authors.[20] C is the third-born child, having a sister eight years older (the subject of Chimombo's 1981a study)[21] and a brother six years older (the subject of Chimombo's 1981b study)[22]. C's mother and father are both university lecturers. C's mother is a native speaker of British English and a fluent second-language speaker of Chichewa, while his father is a native speaker of Chichewa and a fluent second-language speaker of English. At the time of the present study, however, C was not bilingual, a conscious decision having been made to address him in Chichewa at all times, up to the age of 2:6 (the duration of the current study). Furthermore, like both A and B, he was left in the care of a caretaker who spoke to him only in Chichewa. His limited exposure to English prior to the age of 2:6 is reflected in the fact that only ten negative utterances in English were recorded in the course of the 17 months. C is a very talkative child and the total corpus of his audio-recorded negative utterances is 683.

The collection of data being analyzed in this study was originally undertaken to study patterns of mother/caretaker-child interaction in the acquisition of Chichewa syntax and semantics. It was only after recording had started that the researchers became aware of the significance of the children's use of tone to distinguish between different meanings, most clearly the differences between affirmative and negative utterances. Thus, although all tapes were

transcribed by the student researchers as soon as possible after the recording, and before the next recording, and the transcriptions included detailed information on the activities of the child and others interacting with him/her (following Bloom and Lahey[23], Appendix 1), the tones were not immediately marked. The tones were marked by the authors only after all the data had been collected and transcribed.

The following analysis of the acquisition of Chichewa negation is based mainly on C's utterances, because the researchers were unable to continue recording the two girls for reasons beyond the authors' control. However, the data from the girls provide useful insights into possible similarities and/or differences in the strategies for the acquisition of tone in negation, so they have been included for comparative purposes.

3.0 Results

A total of 22 different tone patterns were identified in the three children's 818 negative utterances. A used 11 different patterns, B six, and C 18 (four of which were only for English utterances). Of the 22 patterns, only four were used by all three children: HL, HLH, LHL, and Falling, accounting for 570 (almost 70%) of the 818 utterances. The Falling tone was used only on the English "no," but since it was used regularly not only by C but also by the two monolingual girls and by their caretakers, it was counted as a Chichewa loan word, as were the several instances of "*nono*," with HL and LH patterns. Only one or two tokens of 11 patterns (used in only 14 utterances, five of which were C's in English) were found, making analysis of these 11 unproductive. Thus only 804 utterances are analyzed for tone patterns, although reference is made to the unproductive patterns as they relate to the productive ones. Eight of the patterns A used were productive (i.e. there were more than four tokens of that pattern from the three children), five of the ones B used, and 11 of the ones C used.

We consider each of the tone patterns used by the children in turn, examining the correct and incorrect applications of each pattern with reference not only to the form but also the semantic category of the negative utterances, and the relationship between the children's imitations and correctness. We start with the patterns used by all three children and then consider the remaining patterns in order of productiveness. We then go on to discuss tentative answers to Li and Thompson's questions[24] on the relationship between tone and

morphology acquisition, patterns of tone substitution, and acquisition of tone rules as provided by the data.

3.1 Patterns of Tone Acquisition

3.1.1. HL

The HL tone pattern was the most productive (406 tokens) of all patterns for all the children, with approximately 50% of each child's utterances falling in this category. The HL pattern was used by the children throughout the time-span of the study, from 1:3.1 to 2:6.9. Non-imitated utterances accounted for approximately 75% of A's and C's utterances, and 100% of B's. Of the non-imitated utterances, about 91% were correct, while ironically of the imitated utterances only just over 76% were correct. The high error rate in imitated utterances is largely due to C, for whom almost 25% of imitated utterances were incorrect.

Almost 75% of these utterances signalled rejection, and only oen of these (C's) was incorrect. This suggests that the children very quickly mastered the HL pattern required for both the single word utterance *íyayi* ("no") and also the syntactic negative form of the reduced present progressive of the verb *funa* ("want"). They did, however, use the second (and occasionally the third) rather than the first person singular to refer to themselves initially, and often also, even in the later months, omitted the negative prefix, relying solely on tone to distinguish the negative from the affirmative verb phrase, as in the following example:

(19) C 2:5.7 (C has been playing with other toys. Stops)

C: mamî/

M: mm̌/

>> C: ufúná búku/(meaning ndifúná bukhu ("I want a book")) you-want book/

M: ufúná búkhú liti?/ilí?/
you want book which?/this?/
("Which book do you want?/this one?")

C: iyo/(meaning ilo("that one"))
(incorrect noun concord - class 9 instead of class 5)

M: eh~/ona búkhu/
eh~/see book/ ("eh~/look at the book")

>> C: úfuna búkŭ/x/(cries)(meaning sindifúná bukhu ili
(negative tone) you-want book/ ("I don't want this book"))

M: súfuna búkhu?/ufúná cháni?/
not-you-want book?/you-want what?/
("you don't want the book?/what do you want?")

>> C: úfuna búkŭ/íyo buku/
(negative tone)you-want book/that book/
(meaning síndífuna bukhú ili, koma ilo
("I don't want this book, but that one"))

Only about 8% of the HL utterances signalled negative permission. Just over half of these were single-word utterances using the correct HL pattern, while the remainder (all C's) were multi-morpheme utterances which until 2:0.2 deleted the first morpheme and consequently the L tone assigned to form a LHL pattern for the negative subjunctive form used to signal negative permission. Subsequently, C used the correct morphology while still maintaining the HL tone pattern, or alternatively used the correct LHL tone pattern while reducing the morphology. Here is an example of the former kind:

(20) C 2:4.1 (eating breakfast)

M: ósaseweretsa chakúdyá/údyé
bulédi/udyé
you-not-play-with food/you-eat bread/you eat/
("don't play with your food/eat the bread/eat it")

>> C: úsadye/(meaning ndisádye
("I shouldn't eat it")
you-not-eat/

M: índe údyé
yes-emphatic, you-eat/("yes, you should eat it")

Just over 6% of the HL utterances signalled nonoccurrence. Both A and B marked the correct tones on their utterances, while C marked incorrectly 50% of his. These incorrect utterances were all reductions of the negative indicative recent past, immediate future, or past simple, the first two having a LHL pattern of which the initial L and the morphemes to which it is assigned were omitted, and the last being an extraordinary overgeneralization of the negative reduced present progressive of *funa* ("want") to signal nonoccurrence, thus using the correct HL pattern for síndifuna instead of the required HLHL pattern for the past simple or LHL for the recent past. See example (22) below for a similar overgeneralization.

Approximately 4% of the HL utterances, of A and C but not B, signalled denial, but only two of these were multi-morpheme utterances, both C's. One of them was in English, a correct imitation of C's mother at 2:5.7, and the other at 2:4,14 an overgeneralization of the negative reduced present progressive form for rejection (as happened to signal nonoccurrence) instead of the negative stative copula *sí* plus noun.

Over 3% of the HL utterances signalled nonexistence, all incorrectly omitting the initial L of the required LHL pattern for the negative dynamic copula. Both A and C made this mistake, but only in the early months, up to about 1:10, after which they added the required locative or subject marker to accommodate the correct pattern, which B had mastered from 1:7.6 (with no errors recorded).

Just over 3% of the HL utterances signalled negative commend, but again only A and C used HL for this purpose. A used HL instead of HLH, assigning a L to the last syllable of the monosyllable verb phrase *ósadya* ("don't eat") while C omitted the first two syllables taking HL in the pattern for negative command (HLHL) on all except one of his utterances, this being a correct English utterance.

Only 2 of the HL utterances signalled not-knowing, one, B's, being the single word utterance *káya* with the incorrect tone pattern instead of either L or LH, the other being C's, a multi-morpheme utterance using the correct tone pattern for the present progressive monosyllabic verb súkumva ("you don't understand"), his only

mistake being to use the singular subject marker -u- instead of the plural *-mu-* to address his mother respectfully.

Over 55% of the incorrect HL utterances thus omitted the initial L tone, of the negative indicative immediate future or recent past, the negative dynamic copula, or the negative subjunctive. This suggests that, particularly in the early stages of acquisition of a tone language, the L tone is much less salient. That it is the tone, not the morphology, that is salient is confirmed by the fact that when the negative marker is at the beginning of the verb phrase it is that which is omitted, while when the negative marker is at the end of the verb phrase (as in the negative marker is at the end of the verb phrase (as in the negative dynamic copula form) it is the locative or subject marker which is omitted. This confirmation is further reinforced by the fact that on later utterances with the correct morphology for negative permission the tone pattern remained HL.

3.1.2 HLH

There were 94 tokens of the HLH pattern, accounting for between 6 and 28% of the children's negative utterances. Like the HL pattern, the HLH pattern was used throughout the period of study. Close to 65% were non-imitated utterances, but only 43% of A's utterances were non-imitated, while 72% of C's and 100% of B's were non-imitated. Of the non-imitated utterances only 15% were correct, while of the imitated ones about 44% were correct. The high error rate in both imitated and non-imitated utterances is almost entirely due to C, with all 64 of his HLH utterances being incorrect.

As for the HL pattern, the highest number of HLH utterances expressed rejection, but in this case over 55%. All of the three children's utterances in this semantic category used the wrong tone pattern, HLH instead of HL, placing a H on the third syllable instead of a second L as required.

Almost 30% of the HLH utterances signalled negative command, with all of A's being the correct pattern for the monosyllabic verb phrase *ósadyá* ("don't eat") but C's being the incorrect HLH instead of HL for the single-word utterance *íyayí* ("no"). As for rejection, the incorrect utterances expressing negative command wrongly assigned a H on the third syllable instead of the required L.

Six of the HLH utterances, all C's and all with the wrong tone pattern, signalled nonoccurrence. One was a single-word utterance. One was a unique overextension of the negative dynamic copula (itself with the wrong tone pattern):

(21) C 1:10.3 (C looking out of dining room door toward garage)

C: daawa (=amdala)/ (term of respect for old man gardener/ name C used to refer to gardener

M: amdalaali kuti?/ gardener he-is where?/("where is the gardener)

>> C: yibe pita/meaning *sanapite* ("he hasn't gone) is-not go

M: sanapite/ali mugeraja/ not-he-past-go/he-is in garage/("he didn't go/he's in the garage")

Four were overextensions of the form for rejection to express a recent past nonoccurrence event (cf. overextension of the same form with the HL pattern, discussed above), similar to the following:

(22) C 2:1.24 (C lying on settee)

C: agona/(meaning *ndigona* ("I'm going to sleep")) he-sleep

M: eee/watopa?/ yes/you-perf-tire/("yes/are you tired"?)

C: atopa/(meaning *ndatopa* ("I'm tired")) he-perf-tire/

M: mhm/chabwino/ mhm/OK/

>> C: ufuna atopa(meaning *sindinatope* ("I'm (negative tone) you-want he-perf-tire/

M: mm?/

>> C: ufune/(meaning *sindinatope* ("I'm not tired")) (negative tone) you-want/

M: sufuna kutopa?/unene kuti *sindinatope* / not-you-want to-tire?/you-say that "I'm not tired"/ ("you don't want to be tired?/you should say "I'm not tired")

>> C: atope/(meaning *sindinatope* ("I'm not tired")) (negative tone) past-tire/

Three utterances using the HLH pattern signalled denial, two of C's and one of A's, but all three were single-word utterances, which should have used the HL pattern. Another three utterances, all C's, expressed negative permission using the HLH pattern, again wrongly. One of these was a multi-morpheme utterance which not only selected the wrong tone pattern but also used the negative indicative marker *-sa-* after the subject marker, while maintaining the final vowel of the subjunctive: *sámadźiwa* coming out as *mámadźiwá*.

Thus 67% of the utterances using a HLH pattern made the mistake of placing a H on the final syllable instead of a L, thus changing from the required HL pattern. The remaining incorrect utterances used a HLH pattern instead of the LHL pattern required for the negative recent past and negative subjunctive.

3.1.3. LHL

The 51 tokens of the LHL pattern accounted for between 3 and 19% of the children's utterances. The LHL pattern appeared in the children's speech just a little later than the HL and HLH patterns, at 1:3.16, but continued through the end of the study. Over 50% of these utterances were non-imitated, of which about 70% were correct. Over 90% of the imitated utterances were correct.

Neither A nor B made any mistakes in their utterances using the LHL pattern, so all 10 incorrect utterances came from C. In fact, all except one of these 10 incorrect utterances expressed nonoccurrence, attempting to express the immediate future with the addition of the suffix *-nśo* ("again") which assigns a H to the last syllable of the verb phrase instead of the customary L, thus changing a LHL pattern to a LH pattern. The remaining ten utterances expressing nonoccurrence achieved the correct LHL pattern for the negative immediate future and recent past. In all, over 37% of LHL utterances expressed nonoccurrence.

Close to 30% of LHL utterances, from all three children, expressed correctly nonexistence. Also correct were the over 20% of utterances, again from all three children, signalling negative permission. Only about 10% of LHL utterances, all C's, signalled rejection. The only other incorrect utterance came in this category, an early (at 1:3.16) non-imitation of the single-word utterance *iýayi* , which should take the HL pattern. Two of the correct utterances expressing rejection were in English and two used the negative immediate future correctly, instead of the reduced present progressive.

Thus, all but one of the errors in the use of the LHL pattern were due to non-application of the tone rule connected with the adverbial suffix *-nśo* in C's attempts to express nonoccurrence.

3.1.4 Falling

All three children used a falling tone in a total of 19 utterances expressing rejection (10), negative permission (6), and denial (3). The falling tone was used only from the age of 1:6.18 to 2:2.29. It seems that as the children became more fluent in Chichewa, they needed to use the English single-word utterance "nô" much less frequently. Almost 90% of these utterances were non-imitated, but both imitated utterances were C's, thus confirming the status of "nô" as a loan word, since both A and B used the falling tone on this word only. C, however, in addition to using it in the same way as A and B, also used it on two multi-morpheme utterances. The first was an English utterance dôon't" to signal rejection at 1:7.30. The second was a Chichewa utterance signalling denial, using the negative stative copula, which should take a H, not a falling tone. It is possible that C actually was eliding the L of the subsequent noun, which had a LHL pattern, with the H of the copula, thus turning it into a falling tone.

3.1.5. Rising

A rising tone on the English word "nÖo," which again was treated as a Chichewa loan word, was C's second most productive pattern, with 130 tokens, and was exclusive to him. All of these utterances were considered incoreect. Almost 95% were non-imitations, the few imitations being repetitions after C's mother had imitated his rising tone. Well over 80% of these utterances expressed rejection, about 7% signalled nonoccurrence, almost 4% negative permission, just over 3% each negative command and denial. C used this pattern for les than four months, from 1:5.27 to 1:9.17.

3.1.6 FallingH

A and C used a fallingH tone on a total of 42 utterances, all of which were considered incorrect. Non-imitations accounted for 88% of these utterances, the only imitations being C's. Over 90% expressed rejection, apparently using vowel lengthening to attempt an approximation of the negative tone pattern for *funa* ("want"), causing it to come out usually as *u*na on one occasion with a complement: fûn*á* *sámba* (meaning) *sîndífuna kusámba* ("I don't want to haye a bath")). About 7% expressed denial, and over 2% nonoccurrence. As the rising tone, the fallingH tone pattern was short-lived, being used for just over three months, from 1:85 to 1:11.10.

3.1.7 LH

B and C used the LH tone pattern on 18 utterances, of which 13 were incorrect. They used this pattern between the ages of 1:4.14 and 2:4.14, but it is likely that its use continued beyond 2:6, for those cases requiring application of the tone-doubling rule. Eleven were imitated utterances, all C's, of which seven were incorrect, while six of the seven non-imitations were incorrect. One-third of the utterances expressed rejection, all wrongly using the LH instead of the HL tone pattern. Five, all C's, signalled negative permission, three correctly applying the tone-doubling rule to the final syllable of a monosyllabic verb phrase or of a verb phrase followed by a low-toned complement/object. The other two incorrectly applied the tone-doubling rule to polysyllabic verb phrases without complement/object, giving a LH instead of a LHL pattern. Of the three signalling nonoccurrence (again all C's), one correctly applied the tone-doubling rule to a verb phrase followed by an object, while the other two incorrectly applied it in the absence of a complement/object, again giving a LH instead of a LHL pattern.

Two expressed nonexistence, incorrectly assigning a H to the negative marker of the negative dynamic copula as well as to the verb root, also failing to use the correct LHL pattern, possibly in an attempt to understand the tone-doubling rule. Finally, one utterance, B's, correctly signalled not-knowing using the single-word utterance *kayá* ("I don't know"), and another, C's, incorrectly signalled negative command, inexplicably using the LH pattern instead of the HLHL pattern.

3.1.8 H

There were 16 utterances with a H tone, produced by A and C between the ages of 1:7:14 and 2:1.1. Close to 70% of these were non-imitations, but both the imitations and the non-imitations were incorrect. Only one of the 16 utterances was a multimorpheme utterance, C's, signalling negative permission. Ten of the utterances signalled rejection, three not-knowing, two negative command, and one negative permission. The ten signalling rejection and the two signalling negative command should have used a HL pattern. In the case of those expressing not-knowing, it is possible the children felt a L not to be sufficiently salient, while in the case of the one expressing negative permission, *gágwé* instead of *ndiságwé* ("I shouldn't fall down"), the initial morpheme which should carry the L tone was omitted, while the negative marker and the verb root correctly implemented the tone-doubling rule for monosyllabic verb roots.

3.1.9 HLHL

Only 15 utterances used the HLHL tone pattern, to signal a range of meanings. Only one of these was A's, the rest being C's. Apart from A's utterance at the age of 1:9.13, this was a late pattern to appear, C not using it until 2:2.17. Two-thirds of the uttarances were non-imitations, and 60% were correct, including A's utterance. All were multi-morpheme utterances.

Six utterances expressed nonoccurrence, only one with the correct HLHL tone pattern for the past simple, the others using HLHL instead of LHL for the recent pàst,. Four of the six, including the one with the correct tone pattern, wrongly used the verb *funa* ("want") plus a complement, in a similar way to example (22) above. One used the anaphoric negative *íyayi* plus a recent past (affirmative) verb *chapîta* to mean *sichinapîte* ("it (an insect) hasn't gone"). And the last had the correct morphology for the recent past, but the tone pattern for the past simple.

Four of the utterances signalled rejection, all with the correct tone pattern. Three of these attempted to use the full negative present progressive form, with the correct tone pattern but incorrect morphology, as for example *ímfufúna* instead of *síndikufúna* ("I don't want"). The last was a completely correct emphatic anaphoric negative *íyayítu* ("definitely not"), the suffix-*tu* indicating the emphasis.

Two expressed denial. A's was correct in tone but with incorrect morphology, *nóno uwíbe* instead of *síkúti kulíbe* ("it's not true that there aren't any (peanuts)"). C's was correct in tone pattern but with incomplete morphology, omitting the present progressive tense marker and eliding two syllables of the verb root, *síndiséyetsa* instead of *síndikuséwéretsa* ("I'm not playing with it").

Finally, there was one utterane each expressing cessation, negative command, and negative permission. The first was a correct imitation at 2:2.29 of the tone pattern with the omission of the initial *s-* of the negative indicative marker and the *-k-* of the tense marker in the full present progressive form. *íchiuténtha* instead of *síchikuténtha* ("it's not hot). The second was a completely correct non-imitation at 2:4.14, *osatsika* ("It's not me who should get down").

As was the case with the HL pattern, we have examples of correct tone pattern with incorrect or incomplete morphology and correct morphology with incorrect tone pattern.

3.1.10 HRising

Only nine utterances, two A's and the rest C's, used a Hrising tone pattern, between the ages of 1:7.15 and 2:7.15. Just five were non-imitations, including both A's utterances, and none of the utterances were considered correct. Four were single-word utterances, two expressing rejection, one nonoccurrence and one denial, thus using this pattern in place of HL. Of the five multi-morpheme utterances, all C's two each expressed negative permission and nonexistence, using a Hrising tone pattern instead of the required LHL pattern, omitting the morpheme carrying the first L and changing the second L to a rising tone. One of the utterances signalling nonexistence was a unique use of affirmative morphology with a shake of the head ípǒ (imitating his mother's *ílipǒ* ? ("is there?") instead of *palibe* ("it isn't there"). One utterance signalled

rejection, which should have used a HL pattern, and thus substituted a rising tone for the L.

3.1.11 HLFalling

Only four utterances, all C's, fell into this category, two being single-word utterances using the appropriate tone pattern for an emphatic negative *íyayî* ('no"), one signalling rejection (at 1:3.1) and the other negative command (at 2:0.1). The two multi-morpheme utterances, both signalling rejection (at 2:2.2), used the tone pattern for the negative question form in negative statements, thus replacing the required second L tone by a falling tone.

3.1.12 Unproductive Tone Patterns

The remaining 11 tone patterns were used on only one or two occasions. Two of C's utterances used a rising-falling pattern on single-word utterances, one signalling rejection and the other negative permission, at 1:7.15 and 1:7.28. Both should have used a falling tone. A used a HLHLH pattern on two multi-morpheme utterances, one expressing rejection and the other negative permission, at 1:9.14 and 1:9.15. The former should have used a HL tone pattern and the latter a LHL pattern. C used a HLHrising pattern on two multi-morpheme utterances, both signalling denial, at 2:3.17. Both of these used the by now familiar negative of *funa* ("want") with an affirmative complement in place of the required LHL of the negative recent past. This substitution is thus similar to that in example (22).

Only one token of the remaining eight patterns was identified. Three of these were multi-morpheme English utterances of C's, so will not be discussed, since strictly speaking English is not a tone language. One, B's at 1:8.7, apparently a multi-morpheme utterance, was uninterpretable, so will likewise not be discussed. A used a LHfalling pattern in place of LHL to signal an immediate future nonoccurrence event at 1:9.14, thus using a falling tone in place of the second L. She used a LfallingHL pattern at 1:9.15 to signal denial, when a LH pattern was required for a monosyllabic verb in the immediate future. C used a LHLH pattern instead of a LH at 2:2.29 to signal an immediate future nonoccurrence event with a polysyllabic verb but with the adverbial affix *-nso* ("again") dictating the application of the required tone rule. Interestingly, thus, the three interpretable multi-morpheme utterances using three different tone patterns all signalled immediate future nonoccurrence events.

Finally, C correctly used a L on a single-word utterance to signal negative permission at 2:6.9. This was an example of the use of the affirmative *eee* ("yes" meaning "no") to respond to a negative question. This one correct assignment of the L to this morpheme suggests a correction to C's previous mis-assignment of H, which can only be confirmed when subsequent data have been analyzed. The late appearance of the L tone pattern is suggestive of the non-salience of L tones generally by comparison with H tones.

3.1.13 Summary

Of the 818 utterances examined, just over 75% were non-imitations, of which on average about 56% were correct. Just 68% of A's utterances were non-imitations, close to 80% being correct. Thirty-one out of 32 of B's utterances (almost 97%) were non-imitations, of which almost 84% were correct. Just over 75% of C's utterances were non-imitations, but with only about 50% correct. Of the 25% imitated utterances, just over 60% were correct, with A having about 85% correct, B 100% (only one imitated utterance), and C just over 56%.

Before the age of 2, the children used a total of 19 different tone patterns. After that age, the number of tone patterns in use dropped by almost 50% from 19 to 10 and the average percentage of correct tone patterns rose dramatically to about 76%, with A having 86% and C almost 76% correct tone patterns.

Almost 75% of the children's negative utterances started with a H tone (including a falling tone), while just over 25% started with a L tone (including a rising tone). About 95% of A's utterances, about 75% of B's, and about 72% of C's started with a H tone. This suggests, as mentioned before, that the H tone is far more salient in the early stages of language acquisition, and specifically tone acquisition.

As for the relationship between tone pattern and semantic category, Table 1 gives the distribution for the 11 productive categories. An analysis of variance gave an F-ratio of 28.63, which is significant at the .005 level. Thus, clearly, the children had made some connection between the semantic category, syntactic form, and tone pattern, and their errors were therefore not entirely random.

TABLE 1: DISTRIBUTION OF PRODUCTIVE TONE PATTERNS USED BY SEMANTIC CATEGORY

Tone Pattern	Semantic Category								
	Reject	Nonocc	Notknow	Cessat	NegPerm	NegCom	Nonexist	Denial	Totals
HL	303	25	2	0	31	13	14	17	405
HLH	53	6	1	0	3	28	0	3	94
LHL	5	19	0	0	11	0	15	1	51
Falling	10	0	0	0	6	0	0	3	19
Rising	107	9	0	0	5	4	0	4	129
FallingH	38	1	0	0	0	0	0	3	42
LH	6	3	1	0	5	1	2	0	18
H	10	0	3	0	1	2	0	0	16
HLHL	4	6	0	1	0	2	0	2	15
HRising	3	1	0	0	2	0	2	1	9
HFalling	3	0	0	0	0	1	0	0	4
Totals	542	70	7	1	64	51	33	34	802a

[a]*The semantic category of two utterances was indeterminate, hence the overall total of 802 instead of 804. One of these had a HL and the other a rising tone pattern.*

3.2 Discussion

We now consider each of the three questions Li and Thompson[25] posed, and attempt to give answers on the basis of the above data. We first consider the relationship between tone and morphology acquisition, as revealed in the mismatch between correct tone pattern with incorrect morphology and incorrect tone pattern with correct morphology. We then examine the kinds of substitutions that children make and the extent of error in substituting H for L tones. We finally look at the correct and incorrect applications of the tone-doubling rule, which provide insight into the difficulties children face in acquiring tone rules.

3.2.1 Relationship between Mastery of Tone System and Mastery of Segmental System

Li and Thompson's first question asked what the relationship is between the child's mastery of the tone system and his/her mastery of the morphology of the language. The discussion of patterns of tone acquisition in Chichewa, above, gave a number of examples of cases where the children appeared to have acquired the tone patterns, but without the full morphology required in the adult language. Most notable was the use of the HL pattern from a very early age to signal correctly rejection, but without the negative marker, and without the required change from second to first person to refer to themselves. Then there were also the correct uses of the LHL and HLHL tone patterns, like those of the HL pattern also frequently without the full morphological marking of the negative or tense.

However, there are two points we have to consider before we can credit the children with mastery of the tone system. First, if they can use alongside the correct tone pattern an incorrect tone pattern to signal the same semantic category (with the same syntactic form required), we cannot talk about mastery of the tone system, with or without the appropriate morphological marking. In the case of rejection, for example, the children used the HL pattern, correctly, for just over 55% of their utterances during the study, but they used the HLH pattern, incorrectly, for almost 10% of the utterances throughout the period of study, and a range of other patterns, also incorrectly, for the remaining 35% at different times during the study. Clearly, if 90% correctness is taken as indicative of full acquisition, the children had not completely acquired the HL pattern. Furthermore, they used the HL pattern incorrectly to signal other meanings than rejection, although admittedly the errors were very few, only 4%, after the age of 2.

Secondly, a number of cases were cited where the children used the correct morphology with an incorrect tone pattern. Take, for example, the three cases of negative permission with the full morphology (although failing to change from second to first person) but with HL tone pattern instead of the LHL pattern (or LH for a monosyllabic verb). There was also one case of the full morphology being used with the tone pattern for past simple instead of that for recent past (HLHL instead of LHL), to signal nonoccurrence. Another even more interesting example is the numerous cases of the rejection form being used to signal nonoccurrence, with the correct tone pattern on *ïufuna* (HL) for it to signal rejection, but more often than not with the incorrect tone pattern for the recent past (LHL).

Thus, given the fact that C had not, by 2:6, managed to produce completely error-free negative utteranes, that is with complete morphology and correct tone pattern together (and likewise neither A nor B), it seems to us that we cannot really consider him to have mastered any tone pattern. In effect, in order to have been credited with the acquisition of one tone pattern, the child needs to have demonstrated that he has acquired the full morphology and is not overgeneralizing either the morphology or the tone pattern to another semantic category.

3.2.2 Patterns of Substitution for Tones Not Yet Acquired

The second of Li and Thompson's questions that we are considering in this paper asked about the range of substitutions children make for tones which they have not yet mastered or acquired. For the purposes of this analysis we do not include the contour tones, rising and falling (when occurring in isolation), since these are part of the intonational patterns of Chichewa rather than the tone system. We examine the occasions when a H is used instead of a L, and when a L is used instead of a H, at the beginning in the middle or at the end of a word or phrase which had an incorrect tone pattern. We also consider the number of times a H or L is omitted at the beginning of a word.

Table 2 shows the distribution of substitutions found in the children's speech. It is significant that of the 223 incorrect tone patterns (excluding the two contour tones) 72.5% involved putting a H in place of a L, while only about 19% involved substituting a L for a H. Furthermore, an initial L tone was omitted from 16% of utterances, while a H alone was not omitted once, and an initial HL combination was omitted from less than 2% of utterances. Particularly interesting is the fact that the H tone is preferred at the beginning and end of words and verb phrases, while it rarely substitutes in the middle. Even more interesting is the fact that after 2, only 98 utterances contained errors of tone pattern, as compared with 223 throughout the period of study, but the distribution of errors changed somewhat. As the children got older, they were much less likely to omit any tone, whether L or HL, the beginning L being omitted only 3 times and the HL combination only once in the last six months of the study. Nor did they substitute H for L in the middle of a word or phrase, or L for H at the beginning of a word or

phrase. However, they substituted H for L at the beginning in 22% and at the end in 71%of utterances, and they substituted L for H in the middle in 13% and at the end in 14% of utterances in the later stages.

TABLE 2: PATTERNS OF TONE SUBSTITUTION THROUGHOUT THE STUDY

Position in verb phrase or word	H instead of L	L instead of H
Beginning	32(14%)	8(4%)
Middle	1(0.5%)	16(7%)
End	129(58%)	18(8%)
Totals	163(72.5%)	42(19%)

3.2.3 Acquisition of Tone Rules

Li and Thimpson's questions on acquisition of tone rules: 'What are the differences in the child's output before, during, and after a tone rule is acquired?' and 'At what stage of the acquisitional process are tone rules acquired?' are the most difficult of their questions to answer. We consider here only the acquisition of the rule of tone doubling in Chichewa.

Apart from one utterance of A's at 2:0.5, the only data we have on children's output before, during, and after the tone doubling rule was acquired are C's. Neither A nor B doubled a H tone in any of their utterances apart from the one mentioned, either correctly or incorrectly. Nor were there any instances in their negative utterances when they should have doubled a H tone.

The first utterance in which C doubled a H tone, incorrectly, was recorded at 1:4.28, *íyáyi* instead of *íyayi* . Whether this utterance could be considered as indicating the beginning of an awareness of a tone-doubling rule is rather debatable, especially since for the next three months no utterances doubled a H tone. Then for five months, apart from two utterances of 1:8.10 C only doubled a H

in utterances where the rule was not applicable. In three cases, the required tone pattern was HLHL (to signal negative command), and the actual tone pattern used was two cases HHLL and in the third LLHH. Seven doubled a H on utterances signalling negative permission which required a LHL pattern without tone doubling. Two doubled a H on the single-word utterance *káýa* ("I don't know") instead of the LH pattern. One doubled a H on the last two syllables of *iýáýi*, deleting the first syllable, which should have left a HL pattern. One doubled the H on the first two syllables of the form for nonexistence, which should have had a LHL pattern. Lastly, one had a HHLHH pattern instead of a LHL pattern to signal a nonoccurence event in the recent past.

The two utterancs at 1:8.10 were both attempts to produce correctly the LHH pattern required to signal negative permission on a monosyllabic verb. The first preserved the L but failed to double the H, and the second deleted the initial L but doubled the H: *gaagwé* and *gágwé* for *ndiságwé* ("I shouldn't fall"). These were the first attempts to apply the tone-doubling rule appropriately.

There was not another attempt to apply the rule in the appropriate situation until 2:0.2, when C produced an utterance which had the correct overall tone pattern, and the appropriate doubling of the H tone, but failed to produce the full morphology, so that in fact one of the H tones was assigned to the wrong syllable: *akóźé pansi* instead of *ndisakoźéŕe pansi* . At the same time, C continued to apply tone-doubling inappropriately to negative subjective and recent past tenses while still trying to extend the morphology.

> Then at 2:2.29, C produced 12 utterances which revealed a good deal about his understanding of the tone-doubling rule. The first was an utterance with the correct tone pattern, similar to that produced at 2:0.2, with an object following which triggered the doubling of the H on the penultimate syllable of the verb phrase: *akwéré ndege* (meaning *simunakwéŕé ndege* ("you didn't climb an airplane")). Immediately following came two utterances which doubled the H of the penultimate syllable of the verb phrase without complement or object following, therefore inappropriately: *auménýé* (meaning *ndisakuḿenye* ("I shouldn't hit you")) and *úathé* (meaning *sunáthe* ("it has not finished")). The remaining nine utterances were failures to apply the tone rule on a verb phrase which ended with *-nsó*

("again"), using the LHL, pattern appropriate to the immediate future without the adverbial suffix, instead of the required LH pattern. Eight were attempts at intervals to produce the verb phrase *sindiyambíránso* ("I won't do it again") and one to produce the phrase *sitikweranso* ("I won't ride it again") and one to produce the phrase *sitikweranso* ("we won't ride it (car) again").

C continued to apply the tone-doubling rule under inappropriate conditions in the next three months, as he had done previously, suggesting that he had a rule that doubled the last two syllables of the verb phrase regardless of whether a complement or object followed or not. For example, at 2:4.14 he imitated his brother's *samadziwa* ("he didn't know") with HLHH pattern instead of the correct HLHl pattern. On the other hand, at 2:4.15 he got the correct tone-doubling at the end of the main verb phrase (even though the rest of the morphology was incorrect, as in example (22) above), when it was followed by a complement/object, as in: *ufuna apeeke moni* (meaning *sindinapereke* moni ("I haven't said hello").

At the same time, though, other utterances suggested that he was beginning to understand the application of the tone-doubling rule in the middle of a verb phrase. One of his utterances at 2:4.1 got the correct HLHL pattern, failing to double the second H simply by deleting the syllable that should carry it: *indiseyetsa* instead of *sindikuseweretsa* ("a'm not plying with it (milk)"). But at 2:5.7 he got the correct tone-doubling on *sindifuna* ("I don't want"), even though he hesitated on the verb, which came out as *fufuna* .

Thus, we really cannot be sure that C had acquired the tone-doubling rule by the end of the study at 2:6. The examples given suggest that he had not yet appreciated fully the condition under which the H doubles when followed by a foot and he may have been overgeneralizing the condition of tonedoubling in a negative subjunctive monosyllabic verb phrase to a recent past negative indicative monolyllabic verb phrase. He certainly had not mastered the condition under which an H is assigned to the last syllable of the verb root of a phrase to which *-nso* ("again") is suffixed. We have, therefore, provided data only for discovering what the child's output looks like before and during the acquisition of the tone-doubling rule: beforehand, the child randomly doubles the H according to his own rules, as when he uses a HHLL instead of a HLHL pattern: during the process, he begins to apply the rule correctly on some occasions while still applying it inappropriately, or failing to apply it in the appropriate context on other occasions.

The second question simply cannot be answered, given the fact that the rule of tone-doubling appears not to have been acquired in the course of the study. It will be possible to answer this question only when later data have been analyzed.

4.0. Conclusion

Children learning Chichewa appear to acquire the tone patterns and tone rules independently from and prior to the morpho-syntactic and phonological structure of the forms over which they are superimposed. However, we have questioned whether it is strictly speaking justifiable to talk of the acquisition of a tone pattern or tone rule unless these patterns and rules are applied to the appropriate morpho-syntactic and phonological structure.

The study has also shown that H tone is more salient, at all stages of acquisition of a tone language, and particularly at the beginning and end of words and verb phrases. This finding appears to support Slobin's observation on the salience of the end of words, and Li and Thompson's on the salience of H tones over L tones in the acquisition of Mandarin.[26]

Although our study has provided no more than tentative answers to just three of Li and Thompson's questions,[27] we have hopefully contributed to pushing forward the growth of the study of acquisition of tone from infancy into childhood. With the advances both in the study of adult systems of tone languages and the study of the acquisition of tone by children, the next ten years look promising.

FOOTNOTES

1. Li, C.N. and Thompson, S.A. 'The Acquisition of Tone'. In **Tone: A Linguistic Survey** edited by V.A. Fromkin. New York: Academic Press, 1978, p.271.

2. **Ibid** p.272

3. See for instance Clements, G.N. and Goldsmith, J., (eds.) **Autosegmental Studies in Bantu Tone**. Dordrecht: Foris Publications , 1984; Goldsmith, J. **Autosegmental Phonology**. New York: Garland Publishing Inc., 1976; Goldsmith, J. **Towards an Autosegmental Theory of Accent: the Case of Tonga** Bloomington, Indiana

University Linguistics Club, 1981; Goldsmith, J. "Accent Systems". In H. Van der Hulst and N. smith (eds.) **The Structure of Phonological Representations**, Vol. 1, Dordrecht, Foris Publications 1982: pp. 47-64; Kaye, J., Koopman, H. , Sportiche, D. and Dugas, A. (eds.) . **Current Approaches to African Linguistics**, Vol.2. Dordrecht, Foris Publications, 1983; and Odden, D. "Predicting Tone in Kikuria." In **Current Approaches to African Linguistics**, Vol. 4, Dordrecht, Foris Publications, 1987, pp. 311-326.

4. Li, C.N. and Thomson, S.A., **Op.cit** p.283.

5. Chimombo, M. "Early Stages in the Acquisition of Chichewa Negation". Paper presented at the 4th International Congress for the Study of Child Language, Lund, Sweden 1987.

6. Slobin 1973 p. 205

7. Chimombo, M. and Mtenje, A. "Interaction of Tone, Syntax, and Semantics in the Acquisition of Chichewa Negation". **Studies in African Linguistics** Vol.20.2 (1989 pp.1-26).

8. Mtenje, A. **Issues in the Non-linear Phonology of Chichewa**. Ph.D. Dissertation, University of London, London, 1986; and Mtenje, A. 'Tone Shift Principles in the Chichewa Verb: A Case for a Tone Lexicon. ' **Lingua** 72: (1987 pp. 169-209).

9. Bloom, L. and Lahey M. 1978. **Language Development and Language Disorders**. New York: John Wiley and Sons, (1978).

10. The vowel of the negative prefix is elided with the subject marker vowel in the second person singular and third person singular and plural forms.

11. Bloom, L. and Lahey M. 1978. **Op.cit.** p.199.

12. Chimombo, M. "Overgeneralization in Negation: a Comparison of First and Second Language Acquisition". Ed. D. dissertation, Columbia University, Teacher's College, New York (1981b)

13. Jespersen, O. **Negation in English and other Languages**. Kobenhavn, Denmark: Ejnar Munksgaard (1917, reprinted 1966).

14. Chimombo, **Op.cit**. p.24

15. This /i/ is historically regarded as having been part of the root in Bantu.

16. Chimombo, **Op.cit**. p.2-26

17. Bloom and Lahey, **Op.cit**. p.111

18. In other contexts, the *-be* has other meanings

19. Bloom and Lahey, **Op.cit**. p.190

20. A diary was also kept from 1;0.26 to approximately 1:6, but since the tones were not marked on these entries they have not been analyzed in the current study.

21 Chimombo, M. "A Bilingual Child's Acquisition of Negation: A Semantic-Syntactic Analysis". Paper presented at the 15th Annual TESOL Convention, Detroit, Michigan, 1981

22. Chimombo, **Op.cit**.

23. Bloom and Lahey, **Op.cit**.

24. Li and thompson, **Op.cit**. p.272.

25. **Ibid**

26. **Ibid** p.272

27. **Ibid**