

THE PHONOLOGY AND PHONETICS OF
JAMAICAN CREOLE REDUPLICATION

DISSERTATION

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By

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ABSTRACT

This dissertation is an extensive treatment of the phonological and phonetic properties of Jamaican Creole (JC) reduplication. While reduplication is thought to be a typical feature of Creole languages and has been studied in the past, to date little work has been done on the phonetic or morpho-phonological properties of the process. Complementing the analysis of reduplication developed in this work, is an analysis of the prosodic system of the language. The analysis posited, treats the prosodic system of JC as a stress-based system in which lexical contrasts are signaled by differences in the alignment of the F_0 contour with the word.

Reduplication processes in JC are similar in form and semantics to those found in other Caribbean English Creoles. The processes are described and analysed from an Optimality Theoretic perspective. The phonological aspect focused on delimiting the constraints on the segmental properties of reduplication processes. The observation is that the JC reduplicant is a prosodic foot which copies its base completely. Further, it is shown that when the required phonological conditions cannot be satisfied, there is no reduplication.

The phonetic aspect investigated how the phonological constraints on reduplication interact with the phonetic properties of reduplicated words. Particular

attention is paid to *intensive* and *distributive* reduplication processes, which yield segmentally identical words. Specifically, it is shown that distributive reduplications pattern like other words in the language. Consequently, they are treated as a single prosodic word with a single nuclear pitch accent. Intensive reduplications pattern differently and are analysed as two prosodic words with a prenuclear pitch accent and a nuclear pitch accent.

This work has import firstly for our understanding of the productivity and scope of reduplication in Jamaican Creole. It also contributes to our understanding of the relationship between word-level prosody and the semantic functions of reduplicated words in Creole languages in general. Thus, this dissertation represents an important step towards our understanding of the relatively understudied area of Creole prosodic systems.

Dedicated to my grandparents, Lois and Vaughn

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CHAPTER 1

INTRODUCTION

1.1 Overview

Reduplication is a morphological process in which all or part of an existing word is replicated to form a new word. The process is attested in a wide range of languages where it often marks grammatical or semantic contrasts. For example, in Ju|'hoansi the word *n|ù'í* 'to be shiny' is reduplicated to form the word *n|ù'in|ù'í* 'to cause to be shiny'; in Turkish *gyzel* 'beautifully' reduplicates to form *gyzelgyzel* 'very beautifully'; in Guyanese Creole the word *wâytîi* 'whitish' is reduplicated to form *wâytîiwâytîi* 'whitish all over'; and in Tagalog *lakad* 'walk' reduplicates to form *lalakad* 'will walk'.

Though this process is known to be typical of Caribbean English Creole languages (CECs) (cf. Hall, 1966 in Sebba, 1981), the majority of studies have focused on providing descriptions of the processes or discussions about their origin. Comparatively little is known about the morpho- phonological or phonetic properties of the process. As I show in this dissertation, morpho-phonological as well as phonetic descriptions are crucial to the understanding of the differences between contrasting pairs of segmentally identical reduplicated words. In fact, it has been argued elsewhere that

where reduplication creates segmentally identical words, creole languages manipulate the prosodic properties of the words such as stress or tone, to effect differences in meaning. For example, Devonish (2003) describes verbal reduplication in Guyanese Creole, in which the verb has an iterative meaning if there is a high pitch throughout the word, e.g. *rónrón* ‘to run continuously’. However, when the reduplicated verb has a high-low (falling) pitch on the first syllable and a high pitch on the second syllable e.g. *rônron* the meaning is a distributive one, ‘to run in fits and starts’. Similarly, Sylvain (1936) observed that in Haitian French Creole, differences in meaning between segmentally identical reduplicated adjectives are conveyed by differences in tone. For example, when the meaning is ‘intensive’ the initial syllables of words are pronounced with a high tone e.g. *píkepíke* ‘very pricking’. However, where the meaning is ‘attenuative’ the initial syllables are pronounced with a low tone e.g. *pìkepìke* ‘slightly pricking’.

Cross-linguistic studies on reduplication processes have shown that the processes tend to have specific phonological conditions imposed on them, which are a vital part of the inherent identity relationship between *base* and *reduplicant*. This study accounts for several types of reduplication attested in Jamaican Creole (JC) with the aim of delimiting the constraints on reduplication in the language. Particular attention is paid to two types of reduplication processes that yield segmentally identical words. I test the hypothesis that the contrast between these reduplications is a result of differences in prosodic properties.

Jamaican Creole (JC) has a rich morphological subsystem in which there are several productive processes of reduplication operative in all major word classes yielding

different semantic types. In *distributive* reduplication, the meaning of the reduplicated word has the sense of scattered, all over the place, here and there or occasionally. In *iterative* reduplication, the meaning of the reduplicated word describes an action performed repeatedly and in *intensive* reduplication the degree of quantity (noun), the degree of action (verb) or the degree of quality (adjective) has more intensity or emphasis in the reduplicated word than in the unreduplicated word. The last type is *characteristic* type reduplication where the meaning expressed by the reduplicated form incorporates the feature X, where X is a semantic component of the base. For example, the word *dʒʊk* ‘to pierce’ reduplicates as follows:

- (1) (a) *dʒʊkdʒʊk* ‘prickly object’
 (b) *dʒʊkɪdʒʊkɪ* ‘characteristically prickly all over/ pierced all over’ (Distributive)
 (c) *dʒʊkɪdʒʊkɪ* ‘very prickly’ (Intensive)
 (d) *dʒʊkʌpdʒʊkʌp*¹ ‘to prick repeatedly’ (Iterative)

The form in (a) is a noun which incorporates a distributive meaning; the form in (b) is an adjective and has a distributive meaning. The form in (c) is also an adjective but has an intensive meaning and the form in (d) is a verb and has an iterative meaning. Interestingly, two of these reduplication processes yield segmentally identical forms that are arguably prosodically distinct. For example, the form in (b) with a distributive meaning is segmentally identical to the form in (c) with an intensive meaning. The aim of this study is to discover the nature of the prosodic contrasts between these identical reduplicated words.

¹ This can occur in both predicative and attributive position. In predicative position it indicates a process and in attributive position, it indicates a result of an action. There appears to be no prosodic differences between the two.

This study builds on earlier work (Gooden, 2002; 2003a; 2003b) in which I developed the hypothesis that where different reduplication processes produce segmentally identical words, there are additional requirements at the prosodic level so that semantic distinctions are maintained.

1.2 Goals of the Study

This dissertation investigates how phonological constraints on JC reduplication interact with phonetic properties to define the set of wellformedness conditions on copying. The dissertation is an extensive treatment of the phonology of Jamaican Creole reduplication that also draws on phonetic evidence in an effort to shed light on its prosodic properties. The study focuses in particular on the word-level prosodic properties of two reduplication processes that yield segmentally identical words: distributives and intensives.

Three main issues are addressed. First, the study defines the full range of reduplicative processes in JC. Second, an extensive phonological analysis is provided which accounts for both the segmental and prosodic properties of the reduplicated words. Third, the study describes the phonetic characteristics of segmentally identical reduplicated words and shows how these phonetic characteristics are interpreted in the phonology.

As was noted above, while there is some agreement that differences in pitch may play a role in reduplication in creole languages, there is disagreement over whether the relevant phonological implementation is stress or tone. For example, *stress* was shown to be an important factor in describing Mauritian Creole reduplication (Baker 1999),

whereas *tone* was the crucial factor in Krio (Nylander 1999). For Sranan however, the picture is less straightforward. Dioncie (1959 in Sebba, 1981) for example, suggests that *tone* distinguishes between segmentally identical reduplicated words whereas Adamson and Smith (1999) identify *stress* as the distinguishing feature. An adequate phonological analysis of reduplication in these languages must account for these differences as well as interpret them within the context of the relevant prosodic system. As I discuss in Chapter 4, with regard to pitch, there are crucial differences in the phonetic implementation of the phonological categories stress and tone. With regard to JC I show that a stress is the relevant phonological category rather than tone.

It is important to note, also that while descriptions of the phonetic properties of CEC reduplication are informative, they are based on impressionistic auditory analyses. There is no empirical evidence for whether it is absolute pitch differences (the perceptual correlate of F_0) alone or differences in how the F_0 associates with the stressed syllables of words that accounts for lexical contrasts. The analyses of the JC data proposed in this dissertation provide a background against which to make more robust claims about these prosodic differences in JC, by providing a precise description of the phonetic properties of the words. I show in Chapter 4, that lexical contrasts are accounted for by referring to differences in the alignment of the F_0 contour with words.

1.3 Phonological Aspects

Several issues will be addressed in this dissertation with regard to the phonological properties of reduplication: the shape and size of the copied material (reduplicant); the

location of the reduplicant (prefixed, suffixed); the failure of reduplication in some words; the presence of invariant segments in both the reduplicant and the base which are not observed in the input; and the role of the phonetic properties of the words, specifically, pitch accents, in devising an accurate phonological description of segmentally identical reduplications.

Shape and size of reduplicant. Reduplication in CECs is full reduplication in the majority of cases but there are also cases of partial reduplication (Sebba, 1981; Kouwenberg and LaCharité, 1998; Gooden, 2003a). In both instances, we need to know what the requirements on reduplication are. In cases of whole word reduplication, any discussion of a fixed shape or size of the reduplicant appears to be rendered superfluous since the entire base is copied. Recent work (Alderete, 1993; Gooden, 1999; 2003a) on the morphophonology of reduplication in JC suggests, however, that there are in fact restrictions on how much of a base is copied and further, what such a copy should look like. Gooden (2003a), for example, argues that the reduplicant of characteristic reduplication is a bisyllabic foot. If the reduplicant is too small, a segment has to be inserted, as seen in (2). As discussed in Chapter 7, this vowel is also inserted to satisfy a morphological function.

(2) laaf	‘to laugh’	laaf <u>ɪ</u> laaf <u>ɪ</u>	‘inclined to laughter/jovial’
swit	‘sweet’	swit <u>ɪ</u> swit <u>ɪ</u>	‘characteristically sweet’
daag	‘dog’	daag <u>ɪ</u> daag <u>ɪ</u>	‘characteristically doglike’

If the reduplicant would be larger than two syllables, reduplication is blocked, as in (3).

(3) lɪzad 'lizard' *lɪzadɪlɪzadɪ 'characteristically lizard like'

pɪkɪnɪ 'child' *pɪkɪnɪpɪkɪnɪ 'characteristically childlike'

Location of the reduplicant. Again, in dealing with whole word reduplication, it is difficult to argue for a specific location of the reduplicant with respect to its base, whereas in partial reduplication the argument is more straightforward. Wilbur (1973) and Moravcsik (1978), for example, suggest that in locating the reduplicant in total reduplication, a cue can be taken from general patterns of affixation in the language, if available. For example, if the language has suffixes, then one can assume that the reduplicant is suffixed to the base or if the language has prefixes, that the reduplicant is prefixed to the base. Marantz (1982) on the other hand, suggests that prefixation is the unmarked pattern in reduplication. Designating reduplication as prefixing or affixing by this method is problematic for Creole languages since they tend to have few affixes. For example, GC has a suffix –ii which attaches to intransitive verbs or adjectives to form adjectives (Devonish, 2003). JC has a suffix -ɔp which attaches to verb stems to form a kind of complex verb e.g. *dʒɔk* + *ɔp* = *dʒɔkɔp*². When this form reduplicates it can be either fully copied or partially copied giving different meanings, which overlap in some cases. By Wilbur's suggestion, we could characterize JC reduplication in this case as suffixing reduplication since there are other suffixes in the language. However, by

² It is not clear at this point what the precise semantics of the new form is. Some informants indicate that the word + *ɔp* gives a sense of deliberate action, or repeated action e.g. *dʒɔk* 'to pierce'; *dʒɔkɔp* 'multiple acts of piercing'; 'deliberate act of piercing'.

Marantz's metric we might characterize it as prefixing reduplication since prefixation is the unmarked pattern, i.e. observed more frequently cross-linguistically.

Odden and Odden (1985 in McCarthy & Prince 1995:76) report a case of verbal reduplication in Kihehe that illustrates another way of telling whether the reduplicant is prefixed or suffixed to the base. The prefixes /n/ and /kú/ (kw before vowels) appear before the root, a penultimate H tone occurs in the infinitive. One could argue that the reduplicant is prefixed to the base since the root tones are not copied to the reduplicant. In the examples below, from Kihehe, the portion of the reduplicated word that maintains the prosodic properties of the root (tones) would be the base and the part that does not would be the reduplicant.

(4) /haata/	kú-haāta	kúhaata-haáta	'to ferment', to start <i>id.</i> '
/ita/	kw-íita	kwíita-kwíita	'to spill, to pour a bit'
/tiitu/	n-íitu	niitu-níitu	'black, blackish'

The issue of suffixing versus prefixing reduplication is related to the issue of directionality of copying. Under an OT analysis such as that presented in this dissertation, the issue of directionality is rendered superfluous in the absence of evidence such as that presented for Kihehe in (4). This is because OT allows for a two-way correspondence between base and reduplicant (section 1.6.1). In the analysis of JC reduplication, I compare processes of reduplication with compounding to see whether and how the component parts of the words are differentiated phonologically. I show that both

reduplicated words and compounds have main stress on the right-most foot in the word. With this, I suggest that while reduplication in JC might be analysed as prefixing reduplication which attaches the reduplicative morpheme to a prosodic word it need not be since forms with prefixing and suffixing reduplication are phonetically identical.

Failure of reduplication. As discussed above, though reduplication in JC is a productive process there are instances where reduplication is expected but does not occur. I show that in these cases, reduplication does not apply if a potential base is the wrong foot type or if the base is too large (cf. Gooden, 2003a).

Fixed segmentism. Where a base is augmented to satisfy prosodic foot requirements as in (2) above, the inserted segment is *h*/ in the majority of cases and *h̥*/ in a few cases. In addition to addressing the facts concerning the appearance of a fixed segment in characteristic reduplication, the status of these segments with respect to the general phonology of the language is addressed. I show that the inserted segment serves both a phonological function of permitting the base to achieve the proper foot size and a morphological function of denoting the class of characteristic reduplicated adjectives.

Prosodic properties. Gooden (2003a) examined the prosodic requirements for some classes of reduplication in JC. For example, it was argued that the intensive reduplicant must be a trochaic foot whereas iterative reduplicants need only be a bisyllabic foot. Based on the results of the phonetic study in this dissertation, I show that the prosodic requirements on JC reduplication extend beyond requirements on the well-formedness of foot structure to include requirements for pitch accent association at higher levels of prosody, i.e. the prosodic word.

A secondary goal of this dissertation is to provide preliminary answers to questions about the realization of prominence in JC. For example, is it *tone* as in Saramaccan (Bakker, 1987) *stress* (LePage, 1960), or a combination of both as has been proposed for Guyanese Creole (Devonish, 1989) and Papiamentu (Rivera-Castillo, 1998)? I give an overview of the different arguments presented in support of claims for a stress-based system and a tone-based system in JC. I examine the JC data and establish criteria for characterizing the prosodic system of the language. While an extensive description of the prosodic system of the language as a whole is not undertaken, it is hoped that the description of the prosodic properties of the reduplicated words will shed light on the wider prosodic system.

1.4 Phonetic Aspects

Another objective of this dissertation is to gather acoustic evidence for the types of contrasts that have been suggested as differentiating segmentally identical reduplications. Ultimately, the question that needs to be addressed is the implications of the observed phonetic differences for the specification of the phonological properties of reduplication.

As mentioned in section (1.3), there are reduplication processes in some CECs that produce segmentally identical words. The two known processes in JC are intensive and distributive reduplications. Several researchers have presented data from other related creole languages suggesting that segmentally identical reduplicated words are similar only at the segmental level since they have different prosodic qualities (Sylvain, 1936; Dioncie, 1959; Adamson and Smith, 1999; Devonish, 2003). It was noted also that

we do not have sufficient information about the types of phonetic differences. While suggestions have been made about possible differences in stress or tone, we need to discover exactly what phonological property we are dealing with in order to properly understand the nature of the phonetic differences between the reduplicated words.

Therefore, the goal of the phonetic study of JC reduplication is to find out the exact nature of the phonetic differences between the segmentally identical reduplications. The dissertation is thus largely a study of the production of these words and focuses on the prosodic properties of the words rather than on quantitative measures of specific aspects of the system. The main question is the nature of the prosodic differences between intensive and distributive reduplications.

The acoustic-phonetic analyses described, results from a two-part experiment aimed at providing an adequate description of the prosodic properties of JC reduplicated words. The first part is a pilot perception and production study with one speaker. This pilot study was used to formulate hypotheses about the phonological characterization of the phonetic differences between the reduplicated words. This is a combination of instrumental and auditory observations of the reduplicated words in different sentence positions and in different types of intonation patterns e.g. statement intonation versus question intonation. The second part is a replication of the production part of the pilot study with several other speakers to test whether and how the phonetic properties observed in the speech of the single speaker differed from those of other JC speakers.

The design of the production study was complicated by the fact that differences in meaning between segmentally identical reduplicated words are sometimes associated

with different syntactic functions. For example, Migge (2003) argues that there are two kinds of segmentally identical reduplications in Surinam Eastern Maroon Creoles, which have different meanings but which are generally used in mutually exclusive syntactic environments (see section 2.3). There is one exception to this; both forms occur in prenominal position. In these cases, it is not clear whether the listener relies on contextual cues rather than prosodic cues to identify the meaning of the word. The question is what distinguishes such reduplications when they occur in the same syntactic environments. As I show in Chapter 6, it is possible to keep the syntactic context constant for the target JC forms to see if these reduplications are differentiated, while varying another aspect of the sentential forms — the intonation contour as a whole. This strategy also helps us to determine whether prosodic cues make for a distinction in meaning in identical syntactic environment or whether a particular meaning is conveyed with similar prosodic cues in different syntactic environments. Given the complexity of the matter, the present study addresses only the first issue. Recordings were done of words in isolation as well as in appropriate sentence frames in several different sentential contexts and with several different intonation contours. The sentence frames allow both intensive and distributive reduplications to be freely alternated in the same position without affecting the grammaticality of the sentence as illustrated in (5)

- (5) im want wan yeloyelo mango an som yam
 He wants a yellowyellow mango and some yams.
He wants a very yellow mango and some yams. (Intensive Meaning)
He was a scattered-yellow mango and some yams. (Distributive Meaning)

1.5 Broader Implications

This study is intended firstly as a contribution to our knowledge of the phonology and phonetics of reduplication in Jamaican Creole but it has wider implications for the study of creole phonology in general. Cassidy (1961) claimed that Jamaican pronunciation has greater variation in intonation than American or British English. He carefully noted that this is an impressionistic description and that for a more accurate picture we need to call in mechanical aids to “catch the speech with a recording device and afterwards take it apart laboriously - in short a job for a phonetician...” (pg. 26). In characterizing the prosodic properties of reduplicated words in JC, this dissertation partially takes up this forty-two year old mandate, trusting that it is well answered. I provide a prosodic analysis of the reduplicated words in JC, set against the background of my own characterization of the prosodic system of the language itself.

This type of study is important since the study of the prosodic systems of creoles is a largely unexplored area of research. As far as Caribbean English lexified creoles are concerned, there are large numbers of varieties that are historically connected, but which are nevertheless distinct. This topic therefore provides fertile soil for comparative work using prosodic analyses to shed light on discussions about the development of the prosodic systems of the different CECs and the relationships among them as well as other issues. The JC reduplication data discussed in this work provides the type of groundwork needed for this type of research (cf. Devonish, 1989; 2002; 2003). This study also contributes to our understanding of the relationship between word-level prosody and morphological structure in creole languages as well as in other languages in general.

1.6 Theoretical Assumptions

In languages that have reduplication, in many cases there is co-dependence on phonological processes as well. Reduplication involves addition of material as in other types of affixation, however, the identity of the added material is partially or wholly determined by the base. Some part of the input is repeated to the left, right, or occasionally in the middle (Spencer, 1991). In one of the earliest accounts of reduplication, Wilbur (1973) notes that reduplication resembles a phonological rule, since statements can be made about the shape, size and location of the reduplicant. In this way, it can be said to have a structural description and a structural change. However, Wilbur notes that the rule is determined by grammatical information. Thus, reduplication seems like some sort of affixation in which a process is applied to the base rather than a mere concatenation of one morpheme with another, as in ‘typical’ cases of affixation. Since reduplication has both morphological and phonological properties, its interaction with morphological and phonological rules is of particular interest to phonologists and morphologists alike. Exactly how this interaction takes place has been the source of much debate in the literature. Three of these issues are pertinent to the study of JC reduplication.

There is *the problem of transfer* (cf. Clements, 1985). In analyses of reduplication, there is a problem of accounting for the transfer of information about the prosodic structure of the base to the reduplicant (copied material). Clements highlights four types of information which any successful analysis of reduplication must account for: (a) the size of the copied material; (b) what is copied (the base); and (c) where in

relation to the base the reduplicant will reside, prefixed, suffixed or infix. Yet another problem is accounting for invariant material in reduplicated forms, *fixed segmentism* (Alderete et al 1999). For example, in JC characteristic type reduplication, an *h* consistently surfaces in the reduplicant and base even though it is not present in the input and as such might be treated as a fixed segment. The final problem is that of *location of the reduplicant* with respect to its base. Broselow and McCarthy (1983) for example observed that reduplicative infixes often attach to a prosodic constituent in Samoan. As I discuss in Chapter 7, while the location of the JC reduplicant is not crucial to the analysis, the output forms must be well-formed prosodic constituents.

1.6.1 Optimality Theory

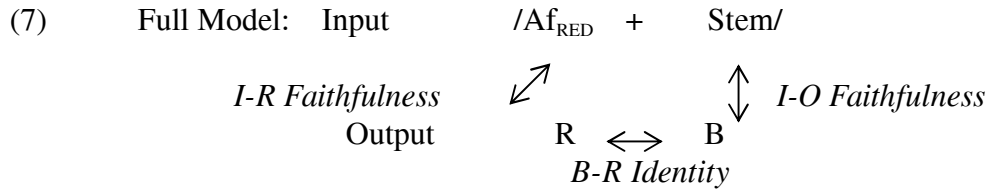
The analyses in this study are done in a Correspondence Theory framework, an offspring of Optimality Theory (OT) (Prince & Smolensky, 1993; McCarthy & Prince, 1995b). McCarthy & Prince (1993b, 1995b et seq.) proposed that the reduplicant and its base are output strings related to each other in a correspondence relationship. This approach essentially capitalizes on the mate relationship proposed by Wilbur (1973). OT differs significantly from ruled-based accounts in that there are no rules. Instead, a given surface form is ‘derived’ from an underlying form by means of a universal set of ranked and violable constraints on well-formedness. It is the interaction of constraints, which results in the selection of the actual surface form. Only the candidate which fares the best with respect to the constraint hierarchy is selected as the output. Therefore, even a candidate that is completely faithful to the input may be ruled out in order to satisfy some higher

ranked constraint. Further, unlike derivational accounts, constraints on reduplicative identity are evaluated in parallel with other constraints on the structure of the output, thus the problem of transfer of prosodic material is immediately overcome.

Correspondence Theory (CT) (McCarthy and Prince, 1995b) places greater emphasis on the correspondence relations, generalizing over various types of faithfulness relations. This is formally expressed in (6).

- (6) Correspondence Given two strings S_1 and S_2 , correspondence is a function from the elements of S_1 to those of S_2 . Elements $\$$ and $\$$ are referred to as correspondents of one another when

There are separate correspondence relations depending on how S_1 and S_2 relate to each other. The constraints on reduplication considered here are of two kinds. The first set minimizes differences between the input and the output (I-O Faithfulness), as between an underlying form (S_1) and a surface form (S_2). The second set minimizes differences between the base and the reduplicant (B-R Identity). In this case, the base is S_1 and the reduplicant is S_2 . The inherent claim of this model is that the reduplicant copies the base, in order to achieve complete identity with it, as is assumed by copy and association models. Unique to this model, however, is the permissible correspondence between *both portions* of the reduplicated word as illustrated in the diagram in (7). This is important in accounting for cases of so-called backcopying (overapplication), in which the phonological properties of the base may be imposed on the reduplicant.



A direct result of correspondence is that there is no intermediate stage, where segmental material is copied and then erased (Marantz, 1982, Bell 1983, Broselow and McCarthy, 1983) or truncated (Steriade, 1988).

Another aspect of the theory which is relevant for the analysis of JC reduplication is Generalized Alignment Theory (GAT), which introduces the idea that reduplicative morphemes are specified for morphological category. GAT's conceptualization of the reduplicative morpheme as phonologically empty differs in an important way from template based approaches in that there are no actual templates. By eliminating templates from the grammar, GAT seeks explanations elsewhere by making use of a general set of constraints on the interaction between prosody and morphology. Urbanczyk (2001) argues that GAT has greater explanatory power than template based accounts since the latter only explain the shape of reduplicative morphemes and say nothing about segmental content. Urbanczyk argues that specific aspects of both the shape and segmental content of a reduplicative morpheme in Lushootseed can be derived from morphological classification. In this way, differences between reduplicative morphemes can be related to a difference in morphological classification. In this dissertation, each reduplicative morpheme is marked for its respective subtype as denoted by the semantic

properties of the output form. For example, RED_{INT} denotes the intensive reduplicant and RED_{ITER} denotes the iterative reduplicant and so on. The phonological analysis shows that a constraint-based approach that permits two-way correspondence between the base and the reduplicant, is well suited to account for these reduplication processes.

For the uninitiated reader, I give a brief illustration of an OT analysis in this section³. In cases of full reduplication, as seen in the creoles discussed in Chapter 2, there must be complete segmental similarity between the base and the reduplicant, as in *nyamnyam* ‘food’ (Sranan). In OT, this is accounted for by means of the Identity constraint in (8):

(8) Maximise Base-Reduplicant (MAXBR): Every element of the base has a correspondent in the reduplicant (McCarthy & Prince, 1995b).

A given form incurs a violation (*) of MAXBR if a segment in the base is not also in the reduplicant. A fatal violation (*!) rules out the form completely. Two possible candidates generated from the input are shown in Tableau 1.1.

³ For a more detailed description I refer the reader to McCarthy, John. 2002. *A Thematic Guide to Optimality Theory*: Cambridge University Press.

	/ RED + nyam /	MAXBR
☞ a	nyam _R nyam _B	
b.	nya _R nyam _B	*!
c.	ny _R nyam _B	*!*
d	n _R nyam _B	*!***

Tableau 1.1: *nyamnyam* ‘food’

The actual surface form shown in (a) (marked by ☞) copies the entire base. All of the segments of the base are seen in the reduplicant, satisfying MAXBR. Candidate (b) does not have all of the segments of the base in the reduplicant. In particular, the /m/ of the base does not appear in the reduplicant. Thus, it fails to satisfy MAXBR and is ruled out as a possible output form. Likewise, candidates (c) and (d) do not satisfy MAXBR because they fail to copy all the segments of the base. Candidate (c) does not copy the /a/ and the /m/ and candidate (d) does not copy three segments /y/, /a/ and /m/.

The inherent claim of this model is that the reduplicant copies the base in order to achieve complete identity with it (as is also assumed by Copy and Association models, cf. Marantz, 1982; Bell 1983, Broselow and McCarthy, 1983; among others). As will be illustrated in detail in the phonological analysis in Chapter 7, complete identity in JC reduplication is not always attainable under these terms, since the process is regulated by prosodic requirements. Unique to this model, however, is the correspondence between both portions of the reduplicated word, the base and the reduplicant, which will be shown to be important in accounting for variable shapes of reduplicants in JC.

Another relevant issue is that of fixed segmentism. In OT, cases of fixed segmentism observed in reduplication are viewed as cases of the emergence of the unmarked (TETU). The idea is that a phonologically unmarked structure that emerges in reduplicated forms is not a condition that is necessarily required in the language as a whole. Unmarked structures are so because they obey the phonoconstraint and marked structures occur when this constraint is violated. The ranking is as follows:

(9) I-O faithfulness >> Phonoconstraint >> B-R identity (McCarthy and Prince, 1995b)

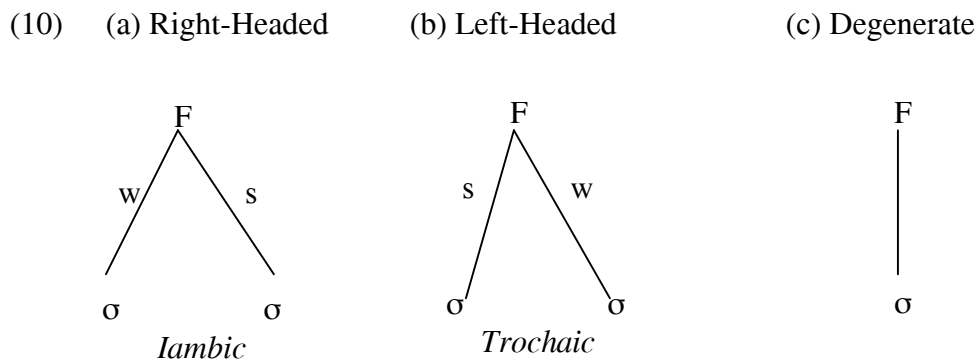
In JC characteristic reduplication, an /ɪ/ always surfaces as the final vowel of the base and the reduplicant whether or not it is in the input form. The phonoconstraint would be one that penalizes the insertion of any other vowel and would be highly ranked since other vowels are not inserted.

1.6.2 Metrical Theory

In this section, I present an overview of the metrical theory of word stress (Lieberman and Prince, 1977; Halle and Vergnaud, 1987; Hayes, 1995) under which the analysis of JC stress is subsumed. While these approaches differ with respect to the formal representation of stress, they all share a common assumption that stress is a rhythmic phenomenon encoded in the strong-weak relationship that exists between syllables in a word. Metrical theory is essentially a study of the relative prominence of syllables and higher-level units of prosody such as the *foot*, which is a rhythmic unit (Kager, 1995;

1999). Based on the properties of stress systems, metrical theory claims that the alternating prominence (rhythm) and sensitivity to syllable weight are among the most important determinants of stress patterns in languages. The potential conflicts between the need to have alternating stress, the need to match syllable weight with syllable prominence (quantity-sensitivity) and the need to mark the edges of morphological domains with metrically strong syllables (edge-marking), are very well suited for the OT analysis which I propose for the JC stress system.

In determining stress patterns in a language, syllables must be organized into *feet*. We must then determine whether these feet are right-headed (iambic) or left-headed (trochaic), headedness being determined by whether the stressed syllable is rightmost or leftmost in the foot. The strong syllable in a foot is referred to as the *head* and the weak syllable as the *non-head*. These relationships are illustrated below.



As shown in (10), feet are parsed into binary units of syllables. This is based on an assumption of metrical theory that feet are only of two maximal sizes, binary or unbounded. We will see later, that under a moraic theory analysis feet can also be

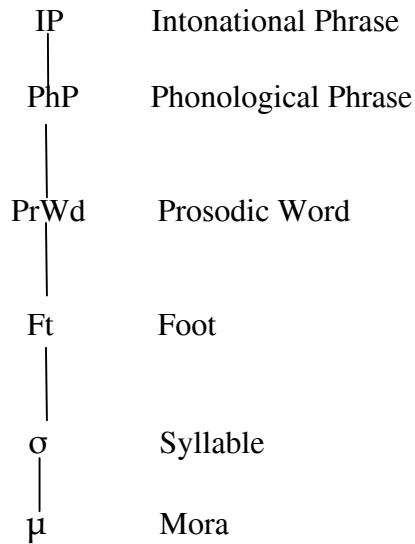
comprised of a single syllable with two moras. Structures like that in (10c), have only one syllable and are referred to as *degenerate* feet. To give a concrete example, let us consider the JC word *poko'mienya* 'revivalist cult'. We can divide the word into two metrical feet of two syllables each as follows:

	x		Word level	
(x)	(x)	Foot level
x	x	x	x	Mora/syllable level
po	ko	mie	nya	

Note that we can talk about a strong-weak relationship between feet within a prosodic word as well as between syllables within a foot. So, at the foot level, the syllables *po* and *mie* are metrically stronger than the syllables *ko* and *nya* respectively. Likewise at the prosodic word level the foot *mienya* is metrically stronger than the foot *poko*. The idea of a maximal size for feet also incorporates the concept of *extrametricality*. Extrametricality designates a particular prosodic constituent as invisible for 'rules' of stress assignment, (Hayes, 1995: 57). That is, stress is assigned without considering the extrametrical entity.

In its representation of stress, metrical theory assumes a set of universal prosodic categories based on the prosodic hierarchy. The premise of the prosodic hierarchy is that every prosodic category, mora, syllable, foot, prosodic word, has as its head an element of the next higher level category, (Selkirk, 1984).

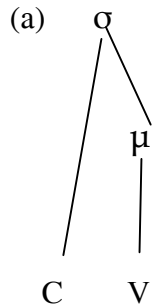
Prosodic Hierarchy



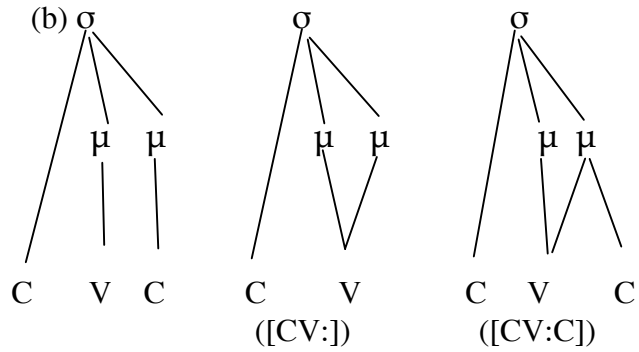
In talking about syllable weight, I will refer to Hayes' (1989) theory of syllable weight and quantity i.e. moraic theory. Rules of stress assignment tend to make a distinction between syllables that are *heavy* and those that are *light*. According to moraic theory, syllable quantity is a function of the number of weight-bearing units or moras in a syllable. It is important to note that in evaluating the weight of a syllable, the segment count is not important since a light syllable may have more segments than a heavy one. For example, in English *pri* of 'prison' has three segments and is light but the syllable *it* has two segments and is heavy. Under moraic theory, a short vowel has a single mora and a long vowel has two moras. We will see in Chapter 4 that in the JC case, this distinction is better captured as a distinction between a non-branching versus a branching rhyme since diphthongs are also treated as heavy. Languages differ on whether or not they allow postvocalic consonants to bear a mora and thus contribute to syllable weight. Hayes (1989) refers to this as a principle of syllabification, *weight-by-position*, that

assigns a mora to a postvocalic consonant in a language. In example (11), coda consonants contribute to syllable weight, so that CVC, CVV and CVVC sequences all count as heavy syllables, having two moras each.

(11) CV - Light



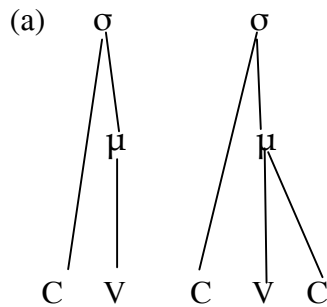
CVC, CVV, CVVC - Heavy



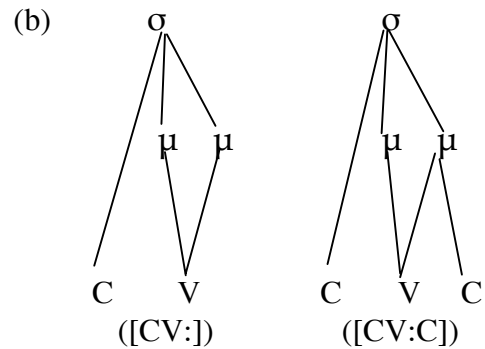
(adapted from Hayes, 1995:52)

In some languages, only CVV and CVVC count as heavy syllables while CV and CVC syllables are treated as light (see (12)).

(12) CV, CVC - Light



CVV, CVVC - Heavy



(adapted from Hayes, *ibid*:52)

The ideas of metrical structure play an important role in prosodic morphology and intonational phonology. The central tenet of the prosodic morphology hypothesis is that word formation processes, including reduplication, make use of authentic units of prosody (McCarthy and Prince, 1993b; 1995a). In chapter 7, I show that JC reduplication has the ‘foot’ as its prosodic target. This is important to the discussion of JC stress since according to (Hayes, 1995), the kind of foot required in a language’s morphological system is the same that is required of its stress system. In notating the different foot types I follow the moraic theory notation, using L for light feet and H for heavy feet.

With respect to intonational phonology, pitch accents and boundary tones are seen as components of prosodic constituents. For example, boundary tones are associated with the edge of phrases defined by the prosodic constituent intonational phrase, while pitch accents may be associated with the syllable or the mora constituent.

1.7 Structure of the dissertation

The dissertation is outlined as follows. Chapter 2 gives a detailed description of the data outlining the different types of reduplication observed in JC that need to be accounted for in the phonological analysis. It also reviews previous studies on reduplication in creole languages in general, but focuses especially on descriptions of reduplication in Caribbean English-lexicon Creoles. This places the descriptions of JC reduplication in the context of reduplication processes in Caribbean English-lexicon Creoles in general.

Chapter 3 provides background information relevant to the study of Jamaican Creole. This includes a historical background of the language, a description of the

contemporary language situation and the rural community chosen for this study. The chapter also includes details of the methods of data collection. Methods used to gather sociodemographic data as well as methodologies employed in the production study are described.

Chapter 4 provides a general description of JC phonology. Drawing on phonetic evidence the chapter provides a characterization of the JC prosodic system as a stress-based system. Former treatments of JC prosody are also reviewed along with studies on the acoustic properties of segmentally identical words. The purpose is to compare strategies used to discover acoustic cues to contrast in stress-accent systems like that proposed for JC.

Chapter 5 presents an overview of the different stress patterns and gives a formal analysis of the stress system in an Optimality Theoretic framework.

Chapter 6 presents the phonetic analysis of word-level prosody of reduplicated words. This is a detailed description and analysis of reduplicated words in different sentential contexts. The results provide evidence for the prosodic differences between distributive and intensive reduplications and also fortify the characterization of word-level prosody in JC as stress-accent.

Chapter 7 provides an Optimality Theoretic account of the different types of reduplications taking into account the issues raised in Chapter 6 regarding the prosodic properties of intensive and distributive reduplications. An assessment is made of the impact of prosodic differences on the reduplication process. Finally, Chapter 8 presents

the concluding remarks and a summary of the analyses and discussions presented in previous chapters.

CHAPTER 2

REDUPLICATION IN JAMAICAN CREOLE AND OTHER CARIBBEAN ENGLISH CREOLES

2.1 Introduction

This chapter summarizes and evaluates previous studies on reduplication in creole languages in general but focuses especially on descriptions of reduplication in Caribbean English-lexicon Creoles (CEC). The discussion is organized around four main issues: the semantic properties of reduplicated words; the types of processes involved in CEC reduplication, i.e. full versus partial reduplication; the use of word-level prosody to contrast the meanings of segmentally identical reduplications; and finally, the classification of the processes according to their morpho-phonological function. I show that the types of reduplication processes observed in Jamaican Creole (JC) as well as the range of meanings expressed, are also seen in other CECs.

Reduplication in CECs produces words with different meanings that are classifiable into six different semantic classes: stative, intensive, iterative, distributive, attenuative and characteristic. In *stative* reduplication, the reduplicated word conveys the sense that the quality referred to by the base has been persisting; for example,

taaku ‘be evil’ reduplicates as *taakitaaku* ‘to be in an evil state’ (Ndyuka). In *distributive* reduplication, the meaning of the reduplicated word has the sense of scattered, all over the place, here and there or occasionally, for example, *naasti* ‘nasty’ reduplicates as *naastinaasti* ‘nasty on occasion’ (Guyanese Creole). In *iterative* reduplication, the meaning of the reduplicated word describes action performed repeatedly, for example, *tiif* ‘steal’ reduplicates as *tiiftiif* ‘to steal repeatedly’ (JC). In *intensive* reduplication the degree of quantity (noun), the degree of action (verb) or the degree of quality (adjective) has more intensity or emphasis in the reduplicated word than in the unreduplicated word, for example, *bisi* ‘busy’ reduplicates as *bisibisi* ‘very busy’ (Sranan). *Attenuative* reduplication results in a weakening of the meaning expressed by the input word. For instance, a reduplicated verb would mean ‘to perform an action to a small degree’, an adjective would yield the sense of ‘possessing a quality to a small degree’ and nouns would give a ‘diminutive’ meaning. For example, *lanġa* ‘long’ reduplicates as *lanġalanġa* ‘longish’ (Sranan). Finally, in *characteristic* reduplication, the meaning expressed by the reduplicated form incorporates the feature X, where X is a semantic component of the base, for example *nġam* ‘to eat’ reduplicates as *nġaminġami* ‘inclined to eat’ (JC).

Reduplication in these languages involves full reduplication in the majority of cases but there are also cases of partial reduplication (Gooden, 2003a; Kouwenberg and LaCharité, 1998; Sebba, 1981). All the languages in this survey have full reduplication, e.g. Gullah, Sranan, and some have partial reduplication as well, e.g. Sranan, Ndjuka, Jamaican. None of the languages have only partial reduplication, which is not a

surprising finding given Moravcsik's (1978) typological survey of languages that have reduplication. According to Moravcsik, if a language has partial reduplication, by implication it also has full reduplication.

Several CECs in this survey are shown to make use of differences in word-level prosody to distinguish between segmentally identical reduplicated words, e.g. Sranan, Guyanese, Jamaican.

I first provide a detailed description of the reduplication processes in Jamaican Creole in section 2.2. In subsequent sections, I discuss how these processes are manifested in other CECs. I discuss the semantic properties of reduplicated words in section 2.3. Section 2.4 reports on the occurrence of full versus partial reduplication processes observed in the languages, then in section 2.5 I discuss the interaction of word-level prosody with processes of reduplication. In 2.6 I survey the classification of the reduplication processes in terms of their morpho-phonological function in each language and summarize the main points of the chapter in section 2.7.

2.2 Reduplication in Jamaican Creole

In this section, I discuss the phonological properties of reduplicated words in Jamaican Creole (JC) which serves as the basis for a formal Optimality Theoretic (OT) analysis in Chapter 7. Unless indicated otherwise, these data are based on my own fieldwork or are from Cassidy and LePage (1967). First, I examine five processes of productive reduplication i.e. intensive (two subtypes), iterative, distributive and characteristic, then I

look at one process which is not as productive or which is arguably obsolete, i.e. scalar reduplication. In the final section, I give an overview of the different phonological properties of JC reduplication which need to be accounted for in the phonological analysis.

Cassidy (1957) made early observations on reduplication processes in JC. Cassidy viewed a reduplicated form as a single combined form with a close juncture, usually with reduced stress on the second portion of the word. Citing a database of 175 forms, he identified reduplication as a productive process of word formation in JC. Cassidy reported that of the 175 forms, nouns were the most numerous (47%) followed by adjectives (34%), verbs (16%) and adverbs (3%). All the cases mentioned are cases of full reduplication, applying to all word classes both within the same category and changing from one category to the next. Examples are shown in (13)

(13)(a)	wasswass	‘wasps’	Noun
(b)	talkytalky	‘to talk a lot’	Verb
	poppop	‘to break all over’	
(c)	foolfool	‘foolish’	Adjective
	tieftief	‘thieving’	
	weewee	‘very small’	
(d)	plentyplenty	‘plentifully’	Adverb
(e)	boutbout	‘round about’	Preposition

According to Cassidy, the meaning of the reduplicated form depends on the meaning of the base and he identified the following four meanings: *iterative, repetition or continuous action; distribution; intensification* - with adjectives; and *attenuation (weakening of qualities)*.

Based on analyses presented in (Gooden, 2003a) I classify the different patterns of reduplication in terms of the meanings they express. In this way, each semantic class defines a distinct subtype. As I discuss further below, what is problematic is that some of the words are segmentally identical but have different meanings. Reduplication in these cases conveys either a *distributive* meaning or an *intensive* meaning. Examples are given in (14) to illustrate the contrast and additional examples are discussed in sections 2.2.3 and 2.2.4.

- | | | | | |
|------|------|----------------|----------|---|
| (14) | swɛl | ‘swollen’ | swɛlswɛl | ‘swollen in different areas (distributive); very swollen’ (intensive) |
| | gomi | ‘gummy/sticky’ | gomigomi | ‘gummy/sticky all over (distributive); very gummy’ (intensive) |

In following chapters, I focus on the class of intensive and distributive reduplicated adjectives. I review phonological and phonetic evidence demonstrating that these reduplications are distinguished prosodically. Further, I argue that this prosodic difference is a key aspect of the semantic interpretation of the reduplicated words.

2.2.1 Iterative Reduplication

In *iterative* reduplication, the meaning of the reduplicated word describes an action performed repeatedly. The base for iterative reduplication is either a complex stem formed from a root and a suffix, e.g. *blakop* ‘to blacken’ or a simple stem, e.g. *kot* ‘to cut’ comprised of just a root.

(15) Root + suffix = Stem		Reduplicated Form	
(a) b ^u odop	'to seal with boards'	b ^u odopb ^u odop	'to seal with boards repeatedly'
pitop	'to spit'	pitoppitop	'to spit repeatedly'
maakop	'to mark on'	maakopmaakop	'to mark on repeatedly'
blakop	'to blacken'	blakopblakop	'to blacken repeatedly'
kotop	'to cut into pieces'	kotopkotop	'to cut into pieces repeatedly' (Cassidy, 1957)
(b) tiif	'to steal'	tiiftiif	'to steal repeatedly' (Kouwenberg and LaCharité, 1998)
kot	'to cut'	kotkot	'to cut repeatedly'
(c) t ^f ambaop	'to cut/chop coarsely'	*	
njakaop	'to cut/chop crudely'	*	
kjata ^o ut	'to scatter (deliberately)'	*	

As shown in (15) the input forms are both simple and complex stems. The iterative reduplicant copies its entire base which is equivalent to the stem in this case, giving the interpretation of action done repeatedly. In the cases in (15a) where reduplication is observed, the stems are bisyllabic; the monosyllabic forms in (15b) are also reduplicated. The forms in (15c) on the other hand, with trisyllabic stems, have no reduplicated forms.

2.2.2 Characteristic Reduplication

This type of reduplication expresses the characteristic nature of the base form. That is, displaying the characteristic X, where X refers to semantic properties of the base (Kouwenberg & LaCharité, 2001; Gooden, 2003a). The input forms are nouns, verbs or adjectives but the output form is always an adjective. This type of reduplication may also be seen as full reduplication in the sense that the base and the reduplicant are identical.

However, a segment not seen in the input form is present both in the reduplicant and in the base. This will be shown to be directly related to the claim that this type of reduplication process is prosodically based. As I show in Chapter 7, the inserted vowel also has a morphological function of marking these types of adjectives. As seen below, the reduplicants in (16a) and (16b) are bisyllabic. Notice however, that the stems corresponding to the bases of the forms in (16a) are also bisyllabic, whereas those in (16b) are not. The forms in (16c) also have bisyllabic stems but have no corresponding reduplicated forms. Likewise the form in (16d) is trisyllabic and has no reduplicated form either.

(16)				
(a)	griɛni	‘grainy’	griɛni-griɛni	‘having grainy, coarse characteristics’
	naasi	‘nasty, filthy’	naasi-naasi	‘having nasty, filthy characteristics’
(b)	laaf	‘to laugh’	laafi-laafi	‘inclined to laughter’
	dʒuk	‘to pierce’	dʒuki-dʒuki	‘prickly or needle-like’
	blak	‘black’	blaki-blaki	‘having black spots or areas’
	bwai	‘boy’	bwaii-bwaii	‘characteristically boyish’
(c)	lizad	‘lizard’	*lizadi-lizadi	
	tʃupid	‘stupid’	*tʃupidi-tʃupidi	
	arɪndʒ	‘orange’	*arɪndʒi-arɪndʒi	
(d)	pikɪni	‘child’	*pikɪni-pikɪni	

A suitable phonological account needs to explain why a vowel is inserted in some words and not in others, why the inserted vowel appears in both the base and the reduplicant, why the inserted segment does not appear in the all reduplicated forms, and also why there are no corresponding reduplicated words for some input stems.

2.2.3 Intensive Reduplication

In *intensive* reduplication the degree of quantity (noun), the degree of action (verb) or the degree of quality (adjective) has more intensity or emphasis in the reduplicated word than in the unreduplicated word (Huttar and Huttar, 1997). The input form is either a morphologically complex stem, e.g. *grin* → *gringrinop* ‘to smile a lot with someone’ or is a simple stem e.g. *swiit* → *swiitswiit* ‘very sweet’.

2.2.3.1 Complex Inputs

Inputs to this type of reduplication are morphologically complex stems with the suffixes *op*, *out* or *aaf*, which give the interpretation of an action done intentionally or of an accomplished action (Gooden, 2003a). Notice that the suffix is not copied in any of the reduplicated forms. The result is that in each case the reduplicant is exactly one syllable smaller than the stem, i.e. partial reduplication.

(17) Root + suffix=Stem		Reduplicated Form	
(a) grn-op	‘to grin...’	gringrinop	‘to smile with someone a lot’
blak-op	‘to make black’	blakblakop	‘to make very black’
bûod-op	‘to seal with boards’	bûodbûodop	‘to seal completely with boards’
baks-op	‘to hit in the face..’	baksbaksop	‘to hit hard in the face’
laaf-op	‘to laugh with’	laaflaafop	‘to laugh with a lot’
ɪŋk-op	‘to soil/cover with ink’	ɪŋkɪŋkop	‘to soil/cover with ink a lot’
âil-op	‘to soil/cover with oil ...’	âilâilop	‘to soil/cover with oil a lot’
kriêp-ôut	‘to scrape out’	kriêpkriêpôut	‘to scrape out...’
waip-ôut	‘to wipe out’	waipwaipôut	‘to wipe out...’
njam-ôut	‘to eat some of’	njamnjamôut	‘to eat some of...’
brok-ôut	‘to break out’	brokbrokôut	‘to break out completely’
kriêp-aaf	‘to scrape off’	kriêpkriêpaaf	‘to scrape off completely’

	wāip-aaf	‘to wipe off’	wāipwāipaaf	‘to wipe off completely’
	njam-aaf	‘to eat completely’	njamnjamaaf	‘to eat completely...’
(b)	naasi-op	‘to make filthy ...’	naasmaasiop	‘to make completely filthy’
	plaasta-op	‘to daub/plaster ...’	plaastaplaastaop	‘to daub/plaster ...’
	doti-op	‘to soil ...’	dotidotrop	‘to soil...’
(c)	ariëndz-op	‘to arrange things’	*	
	sidonj-op	‘to sit upright/sit relaxed for an extended period’		
	maalihak-op	‘to make a mess/ to ruin’	*	
	batabruz-op	‘to bruise extensively...’	*	

Where the stem is bisyllabic, the reduplicant is monosyllabic (17a); where the stem is trisyllabic the reduplicant is bisyllabic (17b). The forms in (17c) show trisyllabic and quadrasyllabic stems which do not have corresponding reduplicated forms. The fact that there is no reduplication in these instances raises interesting questions. This cannot simply be attributed to a prohibition on copying the suffix in reduplication, since iterative reduplication illustrates that some input forms with these suffixes do undergo reduplication. With regard to this type of reduplication, we need to account for (a) how much of the base is copied, (b) why the reduplicant only partially resembles the input, and (c) why some inputs do not have reduplicated forms.

2.2.3.2 Simple Inputs

As seen in the examples in (18), single morphemes may also serve as inputs to intensive reduplication.

(18) Stem		Reduplicated Form	
(a) blak	‘black’	blakblak	‘very black’
swel	‘swollen’	swelswel	‘very swollen’
tɪŋk	‘foul scented’	tɪŋktɪŋk	‘very foul scented’
laŋ	‘long’	laŋlaŋ	‘very long’
fɔl	‘full’	fɔlfɔl	‘very full’
lɔ̃	‘low’	lɔ̃lɔ̃	‘very low’
slɔ̃	‘slow’	slɔ̃slɔ̃	‘very slow’
wayt	‘white’	waytwayt	‘very white’
rayp	‘ripe’	rayprayp	‘very ripe’
laas	‘lost’	laaslaas	‘very lost’
grin	‘green’	gringrin	‘very green’
ril	‘real’	rilril	‘very real’
swit	‘sweet’	switswit	‘very sweet’
ful	‘fool’	fulful	‘very foolish’
flat	‘flat’	flatflat	‘very flat’ (Cassidy, 1957)
nof	‘a lot’	nofnof	‘more than enough’ (Kouwenberg and LaCharité, 2001)
(b) maaga	‘skinny’	maagamaaga	‘very skinny’
grieni	‘grainy’	grienigrieni	‘very grainy’
gomi	‘gummy’	gomigomi	‘very gummy’
ogli	‘ugly’	ogliogli	‘very ugly’
jala~jelo	‘yellow’	jelojelo	‘very yellow’
taakɪ	‘to talk’	taakɪtaakɪ	‘to talk a lot’ (Cassidy, 1957)
plenti	‘plenty’	plentiplenti	‘plentifully’ (Cassidy, 1957)

Notice that the words in (18a) have monosyllabic stems while those in (18b) have bisyllabic stems. In both cases, there is full reduplication. As I discuss just below in section 2.2.4, this subtype of intensive reduplication produces words that are segmentally identical to words with a distributive meaning. In Chapter 6 I show that these two types

of reduplications are different prosodically and as such we need to account for the nature of the differences between the two types of reduplications.

2.2.4 Distributive Reduplication

In *distributive* reduplication, the meaning of the reduplicated word has the sense of scattered, all over the place, here and there or occasionally. Of interest is the observation that there are some reduplicated forms which have identical segmental shapes to those seen above in section 2.2.3, which have an intensive meaning. In the examples in (19), all the input forms are comprised of a single morpheme and are copied completely. Distributive reduplications that are derived from a monosyllabic base appear to take two forms: bisyllabic and quadrasyllabic. All the output forms in (a) are bisyllabic and all the forms in (b) are quadrasyllabic with /ɪ/ as the final vowel of the base and the reduplicant in the majority of cases and /a/ occasionally. Notice that the quadrasyllabic forms in (c) are derived from monosyllabic bases and have the same meaning as bisyllabic forms in (a), e.g. *waytwayt* or *waytwaytɪ* meaning ‘white all over’.

(19)Stem		Reduplicated Form	
(a) blak	‘black’	blakblak	‘black spots all over’
swel	‘swollen’	swelswel	‘sort of swollen/swollen in spots’
tɪŋk	‘foul scented’	tɪŋktɪŋk	‘sort of foul scented’
laŋ	‘long’	laŋlaŋ	‘long in parts’
sl̩o	‘slow’	sl̩oosl̩o	‘sort of slow/slow at times’
wayt	‘white’	waytwayt	‘whitish all over’
rayp	‘ripe’	rayprayp	‘sort of ripe/ripe in spots’
laas	‘lost’	laaslaas	‘sort of lost’
daag	‘dog’	daagdaag	‘scattered dogs/many different dogs’
bwar	‘boy’	bwarbwar	‘various kinds of boys’

grin	‘green’	gringrin	‘green spots all over/greenish all over’
swit	‘sweet’	switswit	‘sweetish all over’
bluo	‘to blow’	bluobluo	‘toy whistle that makes intermittent noises’
kriɛp	‘to scrape’	kriɛpkriɛp	‘scrapings’ ⁴
(b) griɛni	‘grainy’	griɛnigriɛni	‘grainy all over’
gomi	‘gummy’	gomigomi	‘gummy all over’
ogli	‘ugly’	ogliogli	‘ugly all over/in parts’
*mini		minimini	‘scattered spots seen when dizzy’
jala~jɛlo	‘yellow’	jɛlojɛlo	‘yellowish all over’
haafa	‘halved’	haafahaafa	‘in halves’
pisa	‘spliced’	pisapisa	‘in pieces’
*chaka	‘untidy’	chakachaka	‘untidy everywhere’
*nyaka	‘jagged cuts’	nyakanyaka	‘jagged cuts all over’
(c) blak	‘black’	blakɪblakɪ	‘black spots all over’
grin	‘green’	grinigrini	‘green spots all over’
swit	‘sweet’	switswiti	‘sweet ingredients all over’
wayt	‘white’	waytiwayti	‘white spots all over’
pop	‘to break’	poppop	‘to break all over’

While a detailed semantic description of the meanings is beyond the scope of this work, some observations are notable. The distributive meanings expressed can be grouped into semantic types such as *physical property* (e.g. rayp ‘ripe’), *dimension* (e.g. laŋ ‘long’) *colour* (e.g. blak ‘black’). We might also consider that there are some words whose lexical aspect makes them intrinsically distributive e.g. *grain(y)*. If this is the case, then the meaning of the reduplicated item is necessarily distributive. However, some of these forms can have an intensive meaning as well. For the intensive interpretation, *griɛnigriɛni* for example could be glossed as ‘an extraordinary amount of grain/granular particles’. It is perhaps also worth mentioning that the morphosyntactic distinction between true adjectives, which modify nouns, and predicate adjectives which can function as intransitive verbs (Winford, 1997; Migge, 1998), is not relevant here since the

⁴ Note that these are by nature distributed over a given area and so are legitimately classifiable as distributive.

main foci are the phonological and phonetic properties of the words. However, I consider these distinctions in the construction of materials for the production study (see Chapter 6).

2.2.5 Other Types

DeCamp (1974) describes other types of reduplication in JC which have been said to have vowel harmony related to the semantic interpretation of the words. I will refer to these as *scalar reduplication* since the vowel alternations are said to correspond to semantic distinctions in the size and scale of the object or activity. I include these here for the sake of completeness but will not describe them in the formal analysis since they are not consistently recognized by my informants, if at all. Some of these reduplicated words are, thus still in use but cannot always be related to productive bases or often times to other members of the class as described by DeCamp. These like other reduplicated words which lack ‘productive’ bases arguably have strictly lexical uses, and are treated here as peripheral to synchronic reduplication processes such as those I focus on in this dissertation.

- (20)a. maka maka ‘mud’
 moko moko ‘thick mud’
 meke meke ‘thin, watery mud’
- b. mak mak — less intensive than the forms in (a).
 mok mok
 mek mek

- c. maki maki — familiar or jocular versions of the forms in (a).
 moki moki
 meki meki
- (21) a. taga taga ‘to drag’
 togo togo ‘to drag something heavy’
 tege tege ‘to drag something light’
- b. laga laga ‘to carry, lift’
 logo logo ‘to carry, lift something heavy’
 lege lege ‘to carry, lift something light’
- (22) graŋgi graŋgi ‘brushwood, sticks’
 *gronŋo gronŋo
 *greŋge greŋge
 *graŋga graŋga

In all the examples seen above in (20)- (22), the forms are fully reduplicated. That is, the reduplicant is completely identical to the base. DeCamp (1974) and Alderete (1993) note that the absence of non-high vowels in these forms correspond to the observed semantic distinctions. Notice also that all the input forms are no more than two syllables long. In addition, all the words that allow for scalar meanings are of the shape CVCV. The form in (22) with CVCCV segmental shape does not undergo scalar reduplication. Alderete (1993) proposes that the segmental shape of the input forms is related to the permissibility of scalar reduplication. The restriction is that the process applies within the domain of a foot, more specifically a bimoraic foot. Since the form in (22) is trimoraic, non-high vowel harmony does not apply.

Alderete’s paper is one of the first (to my knowledge), to apply a prosodic morphology approach to the study of JC reduplication. One issue which is not addressed in sufficient detail, however, is the nature of the data described. Based on data from

Kouwenberg and LaCharité, (1998 et seq.) and Gooden (1999 et. seq), it is clear that many of these forms are no longer in contemporary use by speakers and more importantly, some processes like the process of vowel-harmony are not observed often if at all. In fact, I would argue that this is not a process of vowel harmony at all but an effect of full reduplication. It is significant that the vowels in the input word are identical to those in the output form. The example in (22) *grangigrangi* supports this alternative view since vowel harmony would predict either **grangagranga* or **gringigringi*, neither of which is attested.

2.2.6 Discussion

This section gave a detailed description of the data outlining the different types of reduplication observed in JC. In the majority of cases observed reduplication involved complete copy of an input form, i.e. full reduplication. However, we observed one case of incomplete copy of the input form and another case in which the entire input form was copied and additional segmental material was added. Additionally, there were cases in which no reduplication was observed. An adequate phonological analysis of JC reduplication needs to account for the differences and similarities between each subtype of reduplication; that is, the shape and size of the copied material (reduplicant), the presence of invariant segments in the reduplicant and the base which are not observed in the input, the failure of reduplication in some words, the location of the reduplicant (prefixed, suffixed) and finally, the nature of the prosodic differences between segmentally identical reduplicated forms.

As noted above, while JC reduplication expresses a range of meanings, there are some processes which produce segmentally identical forms. In particular intensive (simple input) reduplications seen in section 2.2.3.2 are identical to distributive reduplications seen in 2.2.4. I propose that similarity between the two types of reduplications is a result of differences in the prosodic properties of the words, as I show in Chapter 6.

2.3 The Semantics of CEC Reduplication

The semantic notions expressed by reduplicated forms in JC are also expressed by reduplicated forms in other CECs. In the following sections, I give examples of reduplicated words from different CEC languages that express the different meanings.

2.3.1 Iterative

Kouwenberg and LaCharité, (1998 et seq.) examined patterns of reduplication in several Caribbean Creole languages. They include *iterative* reduplication among the types discussed. They develop a distinction between inflectional reduplication which they argue is iconic and derivational reduplication which they argue is non-iconic. Kouwenberg and LaCharité argue that inflectional reduplication in verbs marks a subcategory of imperfective aspect, i.e. iterative, as in the examples in (23).

(23)	Saramaccan	bia	‘to turn’	biabia	‘to wind (of river)’
	Sranan	taki	‘to speak’	takitaki	‘to gossip’
	Ndjuka	suku	‘to look for’	sukusuku	‘to keep looking’

Sebba (1981) also reports this type of reduplication in Sranan; some examples are shown in (24).

(24)	waka	'to walk'	wakawaka	'walk up and down, saunter'
	tan	'to stay'	tantan	'stay intermittently'

Other cases of iterative reduplication are reported for Saramaccan. Baker (1987) claims that iterative meaning is always expressed through reduplication as shown in (25).

(25)	jamba	'to walk'	jambajamba	'to walk up and down'
	bendi	'to bend'	bendibendi	'to totter'

2.3.2 Intensive

Another semantic subtype common to CECs is *intensive*. Huttar and Huttar (1997), examine several processes of reduplication in Ndjuka, including one they refer to as 'augmentation', which is somewhat comparable to intensive reduplication, and other types that express approximation. In many cases, the explanations of the meanings expressed by reduplication are precise and clear. However, there is a problem with their account of the category 'augmentation'. In particular, the meanings they subsume under this label in fact belong to different semantic types. Included in the category, 'augmentation', are meanings of distribution, as well as intensification and duration⁵. Dividing this semantic category, augmentative, into distributive and intensive, provides a better classification of the types of meanings expressed by reduplication.

⁵ Duration is said to be expressed by iteration rather than reduplication.

The intensive meaning gives a greater quantity or greater degree of quality or more intensity or emphasis in the reduplicated form than in the unreduplicated form. The syntactic categories involved include time adverbials (26a), numerals (26b), adjectives (26c), and adverbs (26d).

Ndjuka

(26) a.	dyonso	‘soon, recently’	dyonsodyonso	‘very soon, very recently’
	fuuku	‘early’	fuukufuuku	‘very early’
b.	dunsu	‘thousand’	dunsudunsu	‘many thousands’
c.	pikin	‘small’	pikinpikin	‘myriad small holes’
	gaan	‘big’	gaangaan	‘very big’
	duungu	‘drunk’	duunguduungu	‘very drunk’
d.	saafi	‘slowly’	saafisaafi	‘very slowly’

Kouwenberg and LaCharité (2001) include meanings of emphatic, intensive or augmentative used in the literature under the inflectional category for adjectives. However, all these meanings can be accommodated for by the term intensive as illustrated by the examples in (27).

(27)	Saramaccan	langa	‘long’	langalanga	‘very long’
	Sranan	bisi	‘busy’	bisibisi	‘very busy’
	Ndjuka	tuu	‘true’	tuutuu	‘very true’

Hopkins (2000) reports a few cases of intensive reduplication in Gullah which applies to both nouns and verbs as seen in (28).

(28)	baŋ	‘a loud noise’	baŋbaŋ	‘a very loud noise’
	dɛ	‘there’	dɛdɛ	‘exactly there’
	fil	‘to fill’	filfil	‘to fill entirely’
	wait	‘white’	waitwait	‘very white’

In Sranan, reduplicated adjectives that are derived from adjectives intensify the meaning of the input form as in (29) (Sebba, 1981).

(29)	(a)	bisi	'busy'	bisibisi	'very busy'
		bruya	'confused'	bruyabruya	'very untidy'
		libi	'living'	libilibi	'very lively'
	(b)	krin	'clean'	krinkrin	'entirely'
		wan	'one'	wawan	'alone, only'

The forms in (29) can be classified as intensive in some sense if we see intensive as including entirety and completeness as parts of its meaning.

Similar reports have been given for Saramaccan as seen in the examples in (30), (Bakker, 1987).

(30)	langalanga	'too long'		
	bumbunu	'very good/holy'		
	wante	'right now'	wantewante	'immediately'
	awaa	'now'	awaaawaa	'at this very moment'
	djunsu	'soon, recently'	djunsudjunsu	'just now, very soon'

2.3.3 Characteristic

The third type of meaning expressed in CEC reduplication is the *characteristic* meaning. According to Kouwenberg and LaCharité (2001), the reduplicated word in these cases conveys an 'X-like quality', where X denotes the meaning of the base. The specific meaning of the reduplicated word depends on the word class of the base, i.e. noun, adjective or verb. If the base is a noun, the interpretation is attribution of the presence of the object denoted by the noun as a typical characteristic, or similarity to the object as in

(31). If that base is an adjective, the interpretation is ‘similarity to the quality described by the adjective’ as in (32) and finally, if the base is a verb, the interpretation is attribution of the activity described by the verb as a characteristic activity.

(31)	Saramaccan	baafu	‘soup’	baafubaafu	‘souplike’
	Sranan	tifi	‘tooth’	tiifitiifi	‘cogged, indented’
		frowsu	‘whim’	frowsufrowsu	‘capricious’ (Sebba, 1981)

(32)	geligeli	‘yellowish’
	guuunguuun	‘greenish’
	baafubaafu	‘souplike’
	puilipuili	‘powderlike’ (Bakker, 1987)

2.3.4 Distributive

Devonish (2003) makes similar reports of a type of x-like reduplication in his discussion of Guyanese Creole (GC) reduplication. However, in this case the meaning of the reduplicated word has a *distributive* interpretation. Devonish makes a distinction between compounding reduplication and non-compounding reduplication. This distinction is partly semantic and partly phonological. I discuss the semantic distinctions here and the phonological distinction in section 2.5 when I discuss the prosodic properties of CEC reduplication. Compounding reduplication may have a derived base. Devonish argues that a derivational morpheme –ii attaches to intransitive verbs or adjectives to form adjectives with a distributive meaning. The meaning is ‘having the feature of X, all over’ where X is the base. Further, the precise meaning of the reduplicated word is dependent

on the lexical category of the input. The forms in (33a) have verb inputs; the forms in (33b) have adjective inputs and the forms in (33c) have noun inputs.

(33)	(a)	pik	‘picked’	pikii	‘as if picked’	pikiipikii	‘as if picked all over’
		juk	‘pierced’	jukii	‘as if pierced’	jukiijukii	‘as if pierced all
	(b)	wait	‘white’	waitii	‘whitish’	waitiiwaitii	‘whitish all over’
		wet	‘wettish’	wetii	‘wettish’	wetiiwetii	‘wettish all over’
	(c)	gyorl	‘girlish’	gyorlii	‘girlish’	gyorliigyorlii	‘girlish in many aspects of behaviour’
		brik	‘stone’	brikii	‘stony’	brikiibrikii	‘stony all over’

The examples in shown in (34) illustrate that distributive reduplication in GC applies to all word classes.

(34)	(a)	tjuk	‘to prick’	tjuktjukin	‘prick(ing) from time to time’
		tap	‘to tap’	taptapin	‘tap (ing) from time to time’
	(b)	naasti	‘nasty’	naastinaasti	‘nasty on occasion’
		red	‘red’	redred	‘red off and on’
	(c)	haid	‘hide’	haidhaid	‘hide from time to time’
		daans	‘dance’	daansdaans	‘dance from time to time’
	(d)	wan	‘one’	wanwan	‘in occasional ones’
		plentii	‘many’	plentiiplenti	‘in occasional groups of several’

Huttar and Huttar (1997) describe the meaning in Ndjuka, as giving the sense of people or things being divided or parceled out. They also include the notion of *variety*, which conveys the sense of several groups or kinds or actions dividing things into groups or kinds as illustrated in (35). All of these can be classified as distributive according to the definition I use here.

(35)	waata	‘water’	waatawaata	‘various liquids’
	soutu	‘kind’	soutusoutu	‘many kinds’
	kulu	‘group’	kulukulu	‘different groups’
	tutu	‘two’	tuutuu	‘two, two-by-two’

A few examples from Saramaccan are given in (36), (Baker, 1987).

(36)	wa(n)wan	‘one by one’
	tutu	‘two by two’

2.3.5 Attenuative

Attenuative reduplication is also referred to as approximative reduplication in the literature. Approximative reduplication is said to give the reduplicated word ‘approximative semantics’ (cf. Huttar and Huttar, 1997; Migge, 2003). Migge notes that what she terms approximative reduplication is also referred to as diminutive, imperfective, or pejorative reduplication in the literature (ftn 9). According to Migge, in approximative reduplication, the reduplicated word refers only to part of the quality referred to by its base or it may have a distributive interpretation, for example, *nyoni* ‘small’ > *nyoninyoni* ‘smallish’. Verbs are reduplicated to form verbs or attributive adjectives. I refer to these collectively as attenuative. Examples are shown in (37),

(37)	nyoni	‘small’	nyoninyoni	‘smallish’
	langa	‘long’	langalanga	‘longish’
	piiti	‘torn’	piitipiiti	‘torn in several places’
	nyan	‘eat’	nyannyan	‘eat in several places’

The examples in (38) are reported for Ndjuka (Huttar and Huttar, 1997).

(38)	nyan	‘to eat’	nyannyan	‘nibbled’
	lebi	‘red’	lebilebi	‘reddish’
	lontu	‘round’	lontulontu	‘roundish’

2.3.6 Stative

The fifth semantic category reported in the literature, is stative reduplication. This is said to give the reduplicated word stative semantics. The reduplicated word conveys the sense that the quality referred to by the base has been persisting, for example, *fon* ‘to beat’ > *fonfon* ‘be in a beaten state’ (cf. Alleyne, 1987; Migge, 2003). Verbs are reduplicated to form adjectives that function as both predicates and modifiers of nouns. The following examples in (39) are from Ndjuka (Migge, 2003). The reduplications in question include those in (a) which refer to activities that result in visible or ascertainable states and those in (b) that refer to concepts of human propensity. Winford (1997) makes similar distinctions among reduplicated items in Sranan.

(39) a.	booko	‘to be broken/to break’	bookobooko	‘(be in a) broken (state)’
	fon	‘to beat’	fonfon	‘(be in a) beaten state’
b.	giili	‘be greedy’	giiligiili	‘(be in a) greedy (state)’
	taaku	‘be evil/be ugly’	taakutaaku	‘(be in a) evil/ugly state’

Stative reduplication is also reported for other Creoles. Kouwenberg and LaCharité (2001) give the examples in (40) from their survey. Although enough details are not

given about this type of reduplication, they appear to be similar to Migge's stative reduplications.

(40)	Ndjuka	bai	'buy'	baibai	'bought'
	Saramaccan	singi	'sink'	singisingi	'sunken'
	Sranan		not attested		

Other examples that resemble the stative reduplications are in (41) from Saramaccan (Baker, 1987).

(41)	lailai	'loaded'
	dɛɛdɛɛ	'dried'
	hopohopo	'lifted'

2.3.7 Other Meanings

Reduplication also yields other forms which do not easily fit into any of the semantic classes established here. For example, Kouwenberg and LaCharité (2001) discuss a type of so-called derivational reduplication involving the formation of deverbal nouns and derived adjectives. In both of these cases, they argue that the meanings of the reduplicated forms are not predictable from the meanings of their bases and as such they are non-iconic. For example, in deverbal noun formation we can get meanings such as those expressed by the words in (42).

(42)	Saramaccan	koti	'to cut'	kokoti	'cicatrix, ornamental scar'
		tai	'to tie'	tatai	'string' (instrument)
	Sranan	nyam	'to eat'	nyamnyam	'food'
		tai	'to tie'	tatai	'bundle' (instrument)

Bakker (1987) reports similar cases in Sranan. For example, nominal reduplication typically applies to nouns referring to animals, plants and body parts as in (43). All of these are morphologically frozen forms since they do not have productive bases.

- | | | | |
|------|----------|--|---------------------------|
| (43) | wiwiri | | 'weed, plant, leaf, hair' |
| | konkoni | | 'rabbit' |
| | gorogoro | | 'throat, gullet' |
| | grangran | | 'dry bushes' |

2.4 Full vs. Partial Reduplication

The following cases of reduplication reported on in this section are particularly interesting in that the input word is not completely copied. Based on the data seen above, the majority of processes are processes of full reduplication. The following examples in (44) are from Sranan. Some researchers such as Migge (2003) do not treat these as cases of partial reduplication whereas other do, for example, Bakker (1987) and Kouwenberg and LaCharité (1998).

- | | | | | |
|------|------|------------|---------|-----------|
| (44) | redi | 'red' | redredi | 'reddish' |
| | fatu | 'big, fat' | fatfatu | 'fattish' |

Although it appears that this might be an instance of final vowel deletion (paragoge), a process which is generally operable in the language (Plag and Uffman, 2000), paragoge alone does not explain the presence of the vowel in the base. It is not clear why the vowel should be deleted from one portion of the word and not the other.

Huttar and Huttar (1997) also identify cases of partial reduplication in Ndjuka, which is said to copy the first C(C)V of a base as seen in (45).

(45) (a)	sibi	‘to sweep’	sisibi	‘broom’
	wan	‘one’	wawan	‘just, only’
	tyai	‘to carry’	tyatyai	‘padded headcloth’

2.5 Prosodic Properties of CEC Reduplicated Words

In this section, I discuss issues related to word-level prosody in CEC reduplication. Based on the preceding discussion, we saw that reduplication in many Creoles yielded different semantic types. Where reduplication produces segmentally identical words, it has been observed that there are prosodic differences between the reduplicated words that cue contrasts in meaning. However, while there is some agreement that prosodic differences play a role in reduplication, there is disagreement over whether the relevant phonological category is stress or tone. As I discuss in Chapter 4, this has to do with the related issue of the prosodic classification of CECs. For example, for Sranan, Dioncie (1959 in Sebba, 1981) suggested that *tone* distinguishes between segmentally identical reduplicated words whereas Adamson and Smith (1999) identify *stress* as the distinguishing feature. Devonish (2003) describes verbal reduplication in Guyanese Creole (GC), in which differences in the pitch pattern differentiate between an iterative meaning, *rónrón* ‘to run continuously’ and a distributive meaning, *rônron* ‘to run in fits and starts’.

The fact that these Creole languages emerged out of contact between tone languages and stress or pitch-accent languages is relevant to the discussion of the characteristics of their prosodic systems and by implication to the discussion of word-level prosodic differences in reduplication. We do not yet know how much, if any, of the prosodic system of the input languages is maintained in these Creole languages. As discussed in Chapter 3, the precise impact of language contact on the prosodic system of CECs is still largely unclear (see Devonish, (2002) for some discussion). Perhaps this would account for the differences in the characterization of the same language's prosodic system by different researchers. With regard to JC, Lawton (1963) argues that the language has a tonal system, whereas Cassidy & LePage (1967) place JC in the same category as British RP, having a stress system. In undertaking research on the prosodic properties of reduplicated words, it is imperative to clarify which system is being dealt with since reduplication word prosody can only be properly understood in the context of the wider prosodic system. Chapter 4 gives a more detailed discussion of analyses of the JC prosodic system where I show that JC has a stress-based prosodic system.

Interestingly, Sebba (1981) notes that homophony restricts reduplication so that where there are homophonous words in different lexical categories, only one will reduplicate. Elsewhere, he argues that some forms are reduplicated in order to avoid homophony. Recall that it has been reported that in other creoles, reduplication often creates segmentally identical words. It is not clear whether by homophony Sebba means similarity at both the segmental and the prosodic levels. His claim potentially conflicts with data he cites from Dioncie (1959) in a footnote (ftn.2). Dioncie showed that a

reduplicated adjective may give a ‘defirmative’ (attenuative) or ‘intensive’ meaning as illustrated in (46).

- | | | | | |
|------|----------|--|----------|--|
| (46) | rédiredi | ‘fiery red’
(very red – <i>my gloss</i>) | rediredi | ‘fairly red’
(reddish – <i>my gloss</i>) |
|------|----------|--|----------|--|

According to Dioncie, this difference in meaning (which I interpret as intensive versus attenuative) is given by a higher tone on the first part of the word for intensive reduplication. In addition, Adamson and Smith (1999; 2003) report the use of stress to differentiate the meaning of segmentally identical reduplicated forms in Sranan, giving a diminutive meaning (attenuative) as in (47a), an iterative meaning as in (47b) or an augmentative meaning (intensive) as in (47c).

- | | | | |
|------|----|-----------|--------------------------|
| (47) | a. | fériférfi | ‘to paint a bit’ |
| | b. | fériferfi | ‘to paint several times’ |
| | c. | feriférfi | ‘to paint too much’ |

These reduplicated forms can also function as adjectives with similar meanings. For example, an under painted house, (47a); an over painted house, (47c) and an oft painted house, (47c). We therefore have two reports of the interaction of word-level prosody with Sranan reduplication, one in terms of stress and one in terms of lexical tone.

Migge’s (2003) overview of the reduplication processes in Eastern Maroon Creoles raises the issue of whether segmentally identical reduplications are differentiated only by syntactic function or their position in the sentence rather than by prosodic differences. For example, in Migge’s data, both stative and approximative reduplications can function as adjectives in prenominal position though they are differentiated in other

syntactic environments (Migge, 2003:68). The question is whether the words are differentiated by prosody when they occur in identical contexts since the listener cannot rely on syntactic information. As I discuss in Chapters 4 and 6, commuting contrasting pairs of segmentally identical words in the same syntactic frame is a useful strategy for discovering what the acoustic cues to the contrasts are as well as for resolving the issue of the contribution on context to the interpretation of the reduplicated words.

Migge does report however that in SEM (and Sranan Tongo) reduplicated forms cannot undergo a second process of reduplication. Instead their form stays constant and their meaning changes. In these cases there is a difference in the tone pattern of the reduplicated item. She notes however that this was not observed in the data reported for EMC or Sranan.

A number of researchers make a distinction between real and apparent reduplicated words based on their phonological or phonetic properties (Carter, 1987, Huttar and Huttar, 1997; Migge, 2003; Devonish, 2003). Huttar and Huttar (1997) and Migge (2003), for example, analyse reduplication as “the repeating of all or part of a word (more than a single segment), the result still being a phonological word, with its pitch and stress pattern” (Migge, 2003:2). Migge argues that intensive reduplication does not constitute (true) reduplication but rather repetition, since each part of the word has independent phonological and semantic qualities. Kouwenberg and LaCharité (2001) require that a base has a ‘non-emphatic prosody’ and that the corresponding reduplicated item be ‘produced under a single intonation contour’ (pg.1). Their requirements effectively rule out cases of whole word reduplication in which prosodic differences

signal differences in meaning. As noted earlier, cases like this are reported for several Creoles, for example, Guyanese Creole (Devonish, 2003), Jamaican Creole (Gooden, 1999 et seq.) and Sranan (Dioncie, 1959; Adamson and Smith, 1999; 2003). Another problem is the term ‘non-emphatic prosody’ itself. It is not clear what this means or how this is realized in the different Creole languages being described. A similar problem arises with their notion of ‘a single intonation contour’. Since their database consists of several Creoles some of which are unrelated and have different source languages, it is reasonable to assume that they do not necessarily have identical intonation patterns or prosodic systems. As noted above, this is especially important since prosodically contrastive reduplications of verbs, adjectival and adverbial modifiers have been reported for other English-lexicon Creoles. As I show in Chapters 6 and 7, an understanding of both the phonological and phonetic properties of segmentally identical reduplications is an important aspect of understanding the nature of the contrast between them.

According to Bakker (1987), Saramaccan has lexical tones and in reduplication the tonal pattern of the reduplicated word is identical to the tonal pattern of the input words. It is not clear though what the tonal melody of either part of the word is before reduplication because nothing is said about it. This is especially important since it has been shown that even in cases of full copy, different restrictions apply to the base or to the copied material (McCarthy and Prince, 1995a; McCarthy and Prince, 1995b; Urbanczyk, 2001). If Bakker’s observations are correct however, then this would be a case of total reduplication in which everything including prosodic information is transferred in reduplication. However, Bakker notes that there are exceptions to this rule.

In isolation, the last tone of the reduplicated word is always low and all low tones between high vowels become high tones. Further exceptions are words that were borrowed from Sranan. In this case, they retain the accent patterns of Sranan.

Carter (1987) made two distinctions between phonologically identical forms in Guyanese Creole (GC), i.e. iteration versus reduplication. Carter views iteration as a case in which each part of the repeated form is a separate ‘tone group’; these give an intensive interpretation (48). The words in (48b) are classified as reduplication, which for Carter is a subtype of compounding. Reduplication in GC under her analysis has H-tone deletion for the first component and a nuclear H-tone on the first syllable of the second component of the word, irrespective of the pattern in isolation. Carter claims that this gives the word a distributive meaning though this is not reflected in the glosses given (the ! marks downstep).

(48) (a) táll táll!táll ‘very tall’ (b) talltáll ‘rather tall’
 holéy holéy!holéy ‘very full of holes’ holeyhóley ‘rather holed’

Devonish (2003) argues that Guyanese Creole has both morphological reduplication that copies words and syntactic reduplication that copies phrases. As in Carter’s analysis, Devonish makes a distinction between compounding and non-compounding reduplication. As was noted earlier, this distinction is partly semantic and partly phonological. With regard to the phonological distinction, compounding reduplication gives a distributive meaning and forms a single tone phrase while non-compounding reduplication gives a repetitive/continuous meaning (iterative) and does not

form a single tone phrase. Notice that this distinction is similar to Carter’s distinction between iteration and reduplication. Compounding reduplication is morphological reduplication in Devonish’s treatment and non-compounding reduplication is syntactic reduplication.

Devonish also discusses the tonal description of reduplicated forms. In his analysis, all lexical items in GC have an obligatory HL melody and its location in the word is lexically specified. He assumes also that GC forms tone phrases (roughly analogous to Carter’s tone group), which are constructed from right to left. Words with more than one HL melody are permissible only as the final item in a tone phrase. Finally, the formation of a tone phrase is said to be dependent on compounding.

Unless indicated otherwise, all the reduplicated words in the GC examples in (49) have a HL tone on the first portion of the word and an H-tone on the second portion. In bisyllabic words, the H-tone is on both syllables.

(49)	tʃuk	‘to prick’	tʃuktʃukin	‘prick(ing) from time to time’
	naasti	‘nasty’	naastinaasti	‘nasty on occasion’
	haid	‘hide’	haidhaid	‘hide from time to time’
	wan	‘one’	wanwan	‘in occasional ones’

2.6 Morphological Function of Reduplicated Words

The output of several reduplication processes in CECs produces words that have been classified as property items in the literature. Winford (1997) and Migge (1998), for example, refer to predicative adjectives such as *siki* ‘sick’, *fatu* ‘fat’ as property items

reflecting the observation that they refer to the ‘properties, qualities or characteristics of referents’(Thompson, 1988). Migge states a preference for the latter morphosyntactic label since it is neutral with respect to the syntactic category of these words. Migge also notes that crosslinguistically, property items fall into several syntactic categories such as adjective, verb, or noun depending on their discourse function, (Migge, 1998:116). Based on the grammatical labels for the word class of the reduplicated words, I assume that reduplicated property items serve several of these functions. In addition, Migge’s (2003) study of the syntactic properties of reduplicated words supports this idea.

In Guyanese Creole, compounding reduplication may change the lexical category of the input form, i.e. nouns to adjective or adverbs as in (50a) and verbs to nouns as in (50b) (Devonish, 2003).

(50)	(a)	piis	‘piece’	piispiis	‘in random pieces, piece by piece’
		tap	‘top’	taptap	‘superficial in parts’
	(b)	bloo	‘breathe,	bloobloo	‘whistle, flute’
		lef	‘leave’	leflef	‘left-over food’

2.7 Chapter Summary

In this chapter I described four different processes of reduplication attested in Jamaican Creole (JC). As discussed, the majority of processes in JC as in other CECs are primarily full reduplication but there are also some cases of putative partial reduplication. The reduplicated words serve a variety of functions in the different languages, which can be grouped together as the functions of ‘property items’. In addition, CECs express common meanings in reduplication, though not all the processes are reported for all the languages.

For example, JC does not appear to have a distinct class of stative reduplication. In fact the semantic types found in JC reduplication are a subset of those found across the CECs in general. I also noted that in some cases, JC reduplication created forms which are impossible to distinguish on the basis of their segmental content alone. Similar cases were reported for other creole languages as well, including Sranan and Guyanese Creole. Two of these processes in JC, on which I focus the remainder of this dissertation, are distributive reduplication and intensive reduplication. As I have suggested in this chapter, I propose that these reduplication processes are only superficially similar. Specifically, based on stress facts about the language discussed in Chapters 4 and 6, I show that distributive and intensive reduplication are in fact different at the prosodic level. Further, I present phonetic evidence of this difference in Chapter 6 and show how these phonetic differences are implemented into the phonological grammar of the language in Chapter 7.

CHAPTER 3

JAMAICAN CREOLE IN ITS SOCIOCULTURAL CONTEXT

3.1 Introduction

In this chapter, I discuss aspects of the Jamaican language situation which are relevant to the present study. The most important issue, for our purposes, is that there are three distinguishable language varieties spoken in Jamaica. These include standard Jamaican English, referred to as the *acrolect*, a conservative (rural) creole, referred to as the *basilect*, which is the focus of this dissertation, and an intermediate variety, referred to as the *mesolect*. Together these comprise the Jamaican Creole (JC) continuum. The interaction among these varieties leads to significant variation in the phonological system and in the grammar as a whole.

I provide a general overview of two aspects of the linguistic situation: the contemporary sociolinguistic situation and a sociolinguistic profile of the speech community from which I collected production data. I also discuss issues related to degrees of regional and social variation which have been argued to be effects of the

putative *creole continuum*. This discussion will serve to locate the Top Alston community chosen for this study, as well as the basilectal vernacular spoken by its citizens, within the context of the general sociolinguistic situation.

In section 3.2 I give a broad overview of the sociohistorical background of the language and discuss issues related to the impact of language contact on the phonological properties of the language. Section 3.3 gives an overview of the contemporary linguistic situation. In section 3.4 I present a sociolinguistic profile of the Top Alston community. In 3.5 I present sociodemographic information on the informants interviewed for this research and discuss some issues related to data collection. Section 3.6 summarizes the main points of the chapter.

3.2 Sociohistorical Background

What is known as Jamaican Creole today is a variety forged out of contact between West African languages on the one hand and varieties of the British Isles on the other (Lalla and D'Costa, 1990). This is illustrated in Map 3.1 which shows the sources of the Jamaican population between 1500 and 1700. As is confirmed by the linguistic topography and history of Jamaica, the map also indicates that there are some minor influences from Spanish, which resulted from earlier Spanish colonization (1505 – 1655), Portuguese and Taino (Lalla and D'Costa, *ibid*). The main influence from these sources is seen in a few lexical items (Cassidy and LePage 1967/1980).

Demographic data on the origins and ethnolinguistic composition of slaves brought to Jamaica during the British plantation period (1655 -1808) shows that there were a variety of West African languages involved in contact with English, most of which were typologically similar (LePage, 1960; Arends, 1995). Among these were languages of the New Kwa family, including the Gbe and Akan clusters of languages; languages of the Benue-Congo family, and the Bantu family, particularly the Kikongo group of languages (Bendor-Samuels, 1988 in Migge, 1998; Arends, 1995). The speakers of the Gbe varieties are distributed over four modern West African states: Ghana, Togo, Benin and Nigeria (Migge, 1998: 129). The influence of West African languages on the vocabulary, syntax and segmental phonology of CECs has been convincingly demonstrated in various studies (cf. Smith, 1987; Migge, 1998; Lefebvre 1998 among others). However, little attention has been paid to other possible influences on the prosody of CECs. Exploration of these influences on the prosody of JC is beyond the scope of this present study. However, for purposes of this dissertation, the most important aspect of this contact is that the prosodic system of these languages and that of the English varieties are typologically dissimilar. On the one hand, the West African languages had lexical tone systems and on the other hand the English varieties had stress-accent systems. The precise implications of this for the emergence of Creole prosody are still not well understood. As I discuss below, this has led to conflicting accounts of the prosodic system of Jamaican Creole as well as other CEC varieties.

3.2.1 Impact of Language Contact on Word-Level Prosody

In Creole language contact situations, as in other cases of contact-induced change, a recurrent question is whether the grammar of the emergent contact language consists of separate/coexistent linguistic systems, a single merged system or a system in which there is a superordinate/dominant linguistic system as well as a subordinate system (Weinreich, 1953). With regard to phonology, it is well known that intense contact can lead to varying degrees of transfer from a source language to a recipient language, particularly in cases of second language acquisition, of which creole formation may be viewed as a type. This may result in a new system that is a compromise between the systems in contact (Van Coetsem, 1996). According to Van Coetsem, the accent types in particular are more readily transferred from a source language to a recipient language. In the case of CECs, we do not know how much, if any, of the prosodic system of the input languages was transferred to the languages and most importantly what aspects of the prosodic systems have been retained in the synchronic phonologies of CECs. Harry and Devonish (1998) argue that Caribbean Creoles may have developed prosodic systems that are: (a) similar to those of the European languages in the contact situation; (b) similar to the West African languages in the contact; (c) hybrid systems consisting of influences from more than one West African language; (d) hybrid systems consisting of influences from both European and West African languages; or (e) entirely original having no input from either of the source languages. LePage (1960) mentions several areas of JC which show some influence from West African languages, for example, in some aspects of the

phonemic pattern, the stress system and in some lexical items. Most interestingly for this research, he notes that ‘tones’⁶ are often used to distinguish homophones.

3.2.2 Impact of Language Contact on Reduplication

West African influence on the Jamaican language and culture has long been recognized in the literature. Some linguistic influences noted are: the predominance of CVCV syllable structure, serial verb constructions, reduplication and certain aspects of the tense aspect system (cf. Alleyne, 1980; Holm, 1988, among others). With regard to influence on reduplication, the question is whether the patterns observed in JC can be traced to the input languages, or whether the patterns are themselves innovations and therefore not attributable to any source language. Since reduplication as a productive process is not found in English, it would be necessary to look at reduplication processes in the contributing West African languages to address the first part of this question. In this connection, DeCamp (1974) notes that while reduplication is characteristic of all European-based pidgins and creoles, the process is only marginal in the European source languages and are of a different sort than is found in these contact varieties. Of JC, DeCamp claims that many of the reduplications are clearly of African origin while others are later internal developments (ibid.).

This dissertation does not concern itself with the issue of the origin of reduplication processes in JC⁷ though it is certainly an important one. As noted above,

⁶ Based on data discussed in Chapters 4 and 6 I do not interpret this as meaning lexical tone but rather F₀ differences related to stress.

the related issue of the prosodic classification of the languages in contact is important as well. However, the focus in this study is instead on the synchronic description of JC reduplication and its interaction with JC word-level prosody.

3.3 Contemporary Language Situation

The language situation in Jamaica has been described as a language *continuum* (Reinecke and Tokimasa, 1934), or in DeCamp's (1971) terms, a post-creole continuum. This describes a situation in which two distinct but lexically related polar language varieties co-exist in the same speech community, with intermediate varieties in the 'middle' of the continuum. DeCamp (ibid) for example, recognizes an *acrolect*, which is essentially the local standard English variety; a *mesolect*, which includes a mixture of features from the acrolect and the *basilect*. The basilect is the most conservative variety and is most distinct from the acrolect, having most 'creole features'.

The example in (51) below illustrates some possible variations for the statement 'she was going to school'. As seen, the single statement shows a variety of morphosyntactic forms. The examples in (52) show phonological variation in s-stop clusters (Akers, 1981; Meade, 1995).

(51) im (b) en a go a skuul	basilect
im did a go a skuul	mesolect
im was going to skuul	
shi was going to skuul	acrolect

⁷ See Migge (2003) for a discussion of the origin of reduplication processes in Surinamese Creoles.

(52) /stɪk/	acrolect	/tɪk/	basilect	‘stick’	
	/spɪt/	acrolect	/pɪt/	basilect	‘spit’

I should note here that the term mesolect has been used both collectively and individually to refer to the intermediate varieties in the same speech community. Some researchers (cf. Patrick, 1999) see the mesolect as a variety distinct from both the acrolect and the basilect.

The Jamaican speech community and other creole continua have been characterized as being *diglossic* (McCain, 1996). Diglossia describes a language situation in which there are two language varieties in the same speech community each fulfilling distinct communicative/social roles (Ferguson, 1959). The situation may also involve intermediate varieties; however, unlike creole continua situations, in diglossic situations all speakers are competent in *both* the high and the low variety. Most Jamaicans acquire a creole variety as their first language and learn Standard (Jamaican) English at school as a second variety.

Jamaican speakers are often competent in one or more varieties with varying degrees of proficiency in SJE. While it is generally possible to demarcate particular linguistic features as being Creole forms, it is more difficult to identify discrete divisions between basilect, mesolect and acrolect. Consequently, researchers like Wassink-Beckford (1999) refer to speakers as being dominant in one or another. The different degrees of competence in the different varieties, leads to social and stylistic variation that constitutes the creole continuum.

3.3.1 Variation in Creole Continua

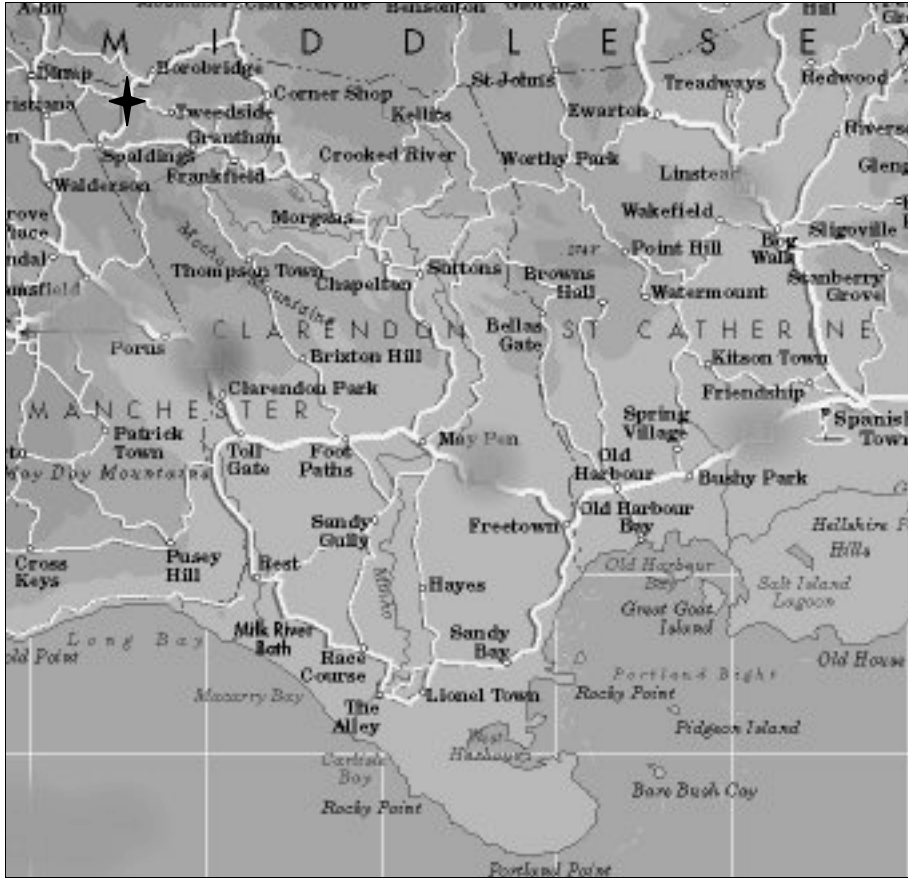
Variation is an intrinsic property of all languages. Even among so-called ‘standard’ varieties, one will find differences in the linguistic behavior of speakers. The recognition that variation exists is even more striking for researchers of creole varieties. This is intimately bound up with the very characterization of the creole language situation as a speech continuum. Variation in creole continua, as in other languages, is nonetheless systematic and the patterns can be shown to be operative at the level of the speech community. In the first place, there is often a correlation between the use of a particular language variety and the socio-economic status of the speaker. Two recent studies on sociolinguistic variation in Jamaican speech communities (Patrick, 1999; Wassink-Beckford, 1999) showed that linguistic variation is observable between the acrolectal end of the continuum and the basilectal end and further that the variation can be attributed to speakers’ social class. In the Jamaican setting, socio-economic status is also bound up with the speaker’s level of education and occupation (cf. Meade, 2001). Other factors such as age and sex have been shown to correlate with linguistic variation as well (see for example, Irvine, 1994; Wassink-Beckford, 2001).

Geographical location also plays a role in linguistic variation. For example, DeCamp (1961) maintains that the most conservative forms of Jamaican Creole are to be found in historically isolated communities in the mountainous regions of the island, i.e. the historical Maroon communities, for example, Accompong. In addition, there are differences to be noted between rural and urban speakers and even among speakers within the same locale (cf. Patrick, 1999). The Top Alston community, which I describe

below, is a rural community located in the hills of the northwestern part of the parish of Clarendon. I selected this community since it was likely to have speakers who primarily use a basilectal variety of JC. This was important since this study is primarily concerned with the most conservative variety of Jamaican Creole. This is on the assumption that it best preserves conservative grammatical features of the language such as the patterns of reduplication under investigation in this dissertation. The choice was thus based largely on the relative isolation of the community, sociodemographic profile of the residents, respondents' opinions from a pilot study conducted in August 2000 and my own familiarity with the community.

3.4 Community Profile

The parish of Clarendon has an area of approximately 1,167 sq km (467 sq miles). The 2001 census of the Statistical Institute of Jamaica (Statin) reports a population of 236,150, making it one of the most populous parishes in the island. The total population reported for Alston was 1,662 persons with an average of 3.9 persons per household (Statin, 2002). Map 3.2 is a map of Jamaica showing the parish of Clarendon, located in the central part of the island. The approximate location of the community is indicated by the star on the map.



Map 3.2. *Partial Map of Jamaica Showing Clarendon and Nearby Parishes*

Top Alston is a farming community located approximately 50 miles north of the capital, Clarendon, May Pen, and about 25 miles from Mandeville, the other major town (See Map 3.2). There are three smaller towns nearby; Spauldings, Frankfield and, Christiana. For people in the community, these towns represent the major business centers, providing services such as banking, police, hospitals, clinics, libraries, shopping etc. Neighbouring communities are (Bottom) Alston and Bailleston, which are separated from Top Alston by a river. Other nearby communities include Tweedside, Wild Cane,

Moravia and Silent Hill. All of these communities are within ‘walking distance’⁸ of each other. Although there have been roads in this community for some time, until approximately five years ago the majority of traffic was pedestrian traffic and people had to travel to the ‘main road’ to gain access to public transportation.

The majority of residents of the Top Alston community are farmers (crops and animal husbandry). Others are employed as seamstresses, electricians, tradesmen or tradesmen apprentices (masonry, carpentry etc.), informal commercial traders (hagglers), shopkeepers for small community shops and part-time taxi operators. With regard to education, the majority of people aged 40 and above, have at least primary level education, while some have no formal education outside of a church setting. For example, one participant reported learning to read after he started attending church at age 56. Those between ages 25 and 40 have secondary level education and some of the younger persons 16 - 25 are pursuing post-secondary level studies.

Many activities such as grave digging and land clearing are still a community effort, though they may now involve some amount of remuneration. Many community-based activities are centered around local churches, for example, rallies, fund raising concerts, baptisms, funerals etc. The majority of participants selected for this study were reasonably well involved in these and other community-based activities. This was important since their level of affiliation with the community might be taken as a measure of their participation in community norms for language use (cf. Milroy, 1980). We might

⁸ The average walking time is about 30 minutes for the closest point to about 60 minutes or more to the furthest point.

therefore expect that other members of the community share patterns of use for reduplicated words similar to those used by the speakers in this sample.

3.5 Data Collection

3.5.1 Subjects⁹

The original subject pool for this study consisted of 40 native speakers of basilectal Jamaican Creole from Top Alston. The acoustic data I report on in Chapters 4 and 6 is taken from 7 of these speakers. These 7 speakers were chosen because they provided productions of both unreduplicated words and reduplicated words in the desired contexts. Further, these speakers participated in a small perception test that verified their perception of the contrast between intensive and distributive reduplications. The subject pool included both male and female subjects in two age groups to control for possible age or sex differences. I assume that rural subjects in general use a more conservative form of the Creole and are able to produce the contrasts clearly. As noted above, speakers in a small, relatively isolated rural community are likely to be competent in a Creole variety closer to what is characterizable as the *basilect*, and would therefore have more Creole features in their speech (cf. Beckford-Wassink, 1999; Meade, 2001). Table 3.1 shows demographic data for the participants whose production data are reported on in Chapters 4 and 6. The majority of these informants reported use of JC in most social settings such as, church, home, among close friends, and English in a few settings, for example,

⁹ The author (SG) lived in this rural area for 20 years prior to moving temporarily to the capital for 3 years.

business. A sample of the informant data sheet used in the interviews to collect this information is given in Appendix A.

Participant	Age	Sex	Highest Level of Education	Language Variety Used Most Often
EW	56	F	Primary	Creole
SG	29	F	Post-Secondary	Creole (English sometimes)
HH	67	F	Primary	Creole
RP	32	M	Secondary	Creole (English sometimes)
WW	64	M	Primary	Creole
SP(m)	42	M	Secondary	Creole (English rarely)
HF	48	M	Secondary	Creole (English sometimes)

Table 3.1. Informant Demographic Data

3.5.2 Production Tasks

As a result of the fact that JC is not written, speakers tend to associate reading and formal situations with English. Given that an interview introduces some level of formality to the interaction between the researcher and the participant, I used several strategies to minimize the level of formality, thereby minimizing the likelihood of influence from English. First, for as much as possible, all interactions with the participants were done in Jamaican Creole; a detailed illustration of a typical elicitation session is given in section 5.1.2.3. Second, I used a picture task to elicit the target words. The advantage of this is three-fold. Alongside the contextual information provided, the pictures helped to cue the desired meaning for each target word and facilitated comparison across productions and across subjects. In addition, the picture task helped to minimize influence from English

which could be potentially introduced through a reading task. From another perspective, since the subject pool included participants with different degrees of literacy, the picture task avoided any potential difficulties with reading as well as removed the undesirable effect of separating participants based on their ability to read¹⁰. Wassink-Beckford (2001) and Gooden (2002) also successfully used picture tasks to elicit data for basilect-dominant speakers in Jamaica and Belize respectively.

3.6. Chapter Summary

The discussion presented here raised several issues which are important for the discussion and analyses in ensuing chapters. First, the linguistic history of Jamaican Creole suggests that there is influence from West African languages and English on the contemporary linguistic system. Strong influence from the former might have resulted in JC prosody manifesting properties of a tone-based prosodic system, as reported for Creoles such as Saramaccan. However, as I show in Chapters 4 and 6 where JC prosody is concerned, the evidence favors a treatment in terms of stress rather than tone. Second, research on any subsystem of creole language varieties has to be mindful of the variability characteristic of creole continua as well as acknowledge that this variation is conditioned by social, regional and situational factors. We saw, for example, that considerable differences in the phonological properties of words were associated with different levels of the continuum. Given all of this, the selection of appropriate speaker samples is vital

¹⁰ One participant at first refused to participate in the session because he thought the tasks involved reading.

to delimiting the variety being targeted for study. In this regard, the community chosen for this research is reasonably well-defined as a community where basilectal speech is used in everyday life by members of the community. This is based on the relative isolation of the community, the demographic data collected for the speakers, as well as the testimonials of the speakers themselves regarding their use of JC.

CHAPTER 4

WORD PROSODY: EVIDENCE FOR JC AS A STRESS-BASED SYSTEM

4.1. Introduction

The aim of this chapter is to provide an overview of the phonological properties of the basilectal variety of Jamaican Creole (JC) and provide background information for the phonetic and phonological analyses presented in following chapters. The chapter focuses in particular on a characterization of JC word prosody. The discussion of JC word level prosody presented here is by no means exhaustive but it is nonetheless an important contribution to discussions on the prosodic identity of Caribbean English Creoles (CEC) as well as other creole languages. The prosodic identity of CECs like JC has been subject to much debate. The fact that these languages emerged out of contact between tone languages and stress-accent languages is an important aspect of the characterization of their prosodic systems. As discussed in Chapter 3, there are several possible scenarios for the effect of language contact on the prosodic system of creoles.

While traditional typologies classify languages as tonal, stress-accent or pitch-accent, several CECs have been classified as having both stress and tone operative in their prosodic system, i.e. a merged system. For example, Devonish (1989; 2002; 2003) argues that CECs like Guyanese, Ndjuka and Jamaican among others are restricted tone languages having only an underlying H tone and a surface HL tone melody. In addition, these languages have stress, the assignment of which is dependent on the location of the H tone in words. Brousseau (2003) claims that the phonological systems of Haitian appear as a compromise between those of its contributing languages and Good (2003) argues that some words in Saramaccan have prominences related to stress and other words have prominences related to tone. Similar arguments have been presented for other Caribbean creoles as well; for example, Papiamentu (Rivera-Castillo, 1998) and Ndjuka (Huttar, 1988).

Despite this broad consensus, there is disagreement on exactly how the roles of stress and tone are distributed. Remijsen (2001) points out that in order for more than one system to be functional in any language, the phonetic encoding must be distinct. Devonish (1989) points out that the problem is how to distinguish between pitches produced as a result of the presence of stress and those produced as a result of the presence of lexical tone. Carter (1980) argues that while all languages use pitch in a systematic way, they vary according to the role and function of pitch in the linguistic system. As such, the presence of pitch contrast in minimal pairs is not sufficient to classify a system as tonal. What is needed is additional distributional evidence to form a characterisation of the prosodic system as a whole. The idea of a 'mixed' prosodic system is not unique to Caribbean Creoles. Ramijsen (2001) and deLacy (2002), among others, discuss a wide range of

languages which have both lexical tone and stress. In these languages, tone and stress interact to optimize stress assignment or the location of tones in words.

In the discussion of the JC word level prosodic system presented in this chapter I examine phonological data in support of the proposal that Jamaican Creole can be classified as a stress-accent language. I show that JC has stress system in which syllable prominence is signaled by an F_0 fall within the word. This classification forms the basis of the analysis of the prosodic differences in the segmentally identical reduplicated words in following chapters.

The chapter is organized as follows. Sections 4.2 and 4.3 give background information on JC concerning the phonemic inventory and presents assumptions regarding syllable structure, foot structure and moraicity that are important for subsequent analyses. Section 4.4 reviews different perspectives on the classification of JC word level prosody. Here I lay out both phonological and phonetic criteria for the classification of the prosodic system. Section 4.5 provides empirical evidence for the classification of JC prosody in terms of stress. In section 4.6 I give an overview of the strategies used for discovering the acoustic cues to stress and accent contrasts in several languages and describe how these strategies are applied to the JC data. Section 4.7 provides phonetic data on the F_0 pattern in a variety of monomorphemic words and compounds as further illustration of the phonetic realization of stress in JC. In the final section, I summarize the main points discussed in the chapter and highlight the implications of stress for the analysis of the two processes of reduplication that yield segmentally identical words.

4.2. The Phoneme Inventory

I adopt the basic phonemic inventories of Meade (2001) and Beckford-Wassink (2001) with some modifications where necessary. The phonemic inventory of consonants is shown in Table 4.1 and the inventory for vowels is shown in Table 4.2. I assume, based on the basilectal data presented in Meade and Beckford-Wassink, that these inventories are representative of the basilectal variety of JC spoken by the informants in this research. This is based on the fact that the sociodemographic data provided for the basilectal speakers in both studies closely matched that of the speakers in this study. The speakers in Beckford-Wassink's study were all lower working class persons who were born and raised in a rural community in St. Thomas; those in Meade's study were from a rural community, Guys Hill, in St. Catherine and had no more than primary level education and were typically unemployed or had manual-skilled jobs. The speakers interviewed for this dissertation, are also from a relatively isolated rural community. The majority of these speakers have primary level education and are farmers or hold other manual-skilled jobs (refer to Chapter 3 for additional details). We can further assume that the similarities among the speech of informants from these different rural communities stem from the observation that speakers in smaller relatively isolated rural communities are likely to speak a creole variety that is closer to a basilectal variety.

Table 4.1 shows the phonemic consonant inventory. In addition to those listed here, Meade (1996; 2001) also lists *gj* and *kj* as palatalized allophones of *g* and *k* which occur before the low back vowel /a/; Patrick (1999) discusses the palatalization of these sounds in detail. It should also be noted that *h* occurs sporadically being typically absent in

words like *ama* ‘hammer’ and *ed* ‘head’, occurs in hypercorrected forms like *hegg* ‘egg’ and appears consistently in words like *hafu* ‘type of yam’ and *haaspital* ‘hospital’.

	Bilabial	Labiodental	Alveolar	Postalveolar	Palatal	Velar	Glottal
Stop	p b		t d			k g	
Fricative		f v	s z	ʃ ʒ			h
Affricate				tʃ dʒ			
Nasal	m		n			ŋ	
Approximant	w		l r		j		

Table 4.1: JC Consonant Inventory

Table 4.2 shows the phonemic vowel inventory. As shown, basilectal JC speakers distinguish between seven short vowels, three long vowels and three diphthongs. Examples of the different vowel length and diphthong contrasts are shown in (53).

		Front	Central	Back
High	Tense	i		u
	Lax	ɪ		ʊ
Mid	Tense	e		
	Lax	ɛ	ʌ	
Low				a
Diphthongs		ie	aɪ	uo
Long vowels		i:		a: u:

Table 4.2: JC Vowel Inventory

(53)	dʒuk	‘pierce ‘	dʒuok	‘joke’
	lɪk	‘hit/lick’	liek	‘lake’
	pan	‘metal container’	pam	‘pineapple’
	mata	‘mucus from eyes’	ma:ta	‘mortar’
	bita	‘bitter’	bi:ta	‘beater’
	ful	‘full’	fu:l	‘fool, simpleton’

Some amount of controversy has surrounded the JC phoneme inventory mainly with regards to the long vowels, diphthongs and the palatal sounds /kj/, /gj/ and /nj/. Cassidy and LePage (1967) and Akers (1981), for example, include the palatal phones creating a total consonant inventory of 23 phones¹¹. On the other hand, Whittle (1989), Devonish and Seiler (1991) and Meade (1996; 2001) treat the palatal sounds as allophones of the phonemes *k*, *g* and *n* so that the tally of consonants amounts to 20. With regard to vowels, some authors list as few as 9 vowels in their inventory (Lawton, 1963; Lalla and D'Costa, 1990) while others list up to 16 vowels (Wells, 1973; Veatch, 1991 in Wassink-Beckford, 2001). There is some agreement that the basilectal variety has a basic 5-vowel system in which length is contrastive. However, authors disagree on just how many long vowels there are. For example, LePage (1960) lists only two long vowels, Lawton (1963) has none, Wells (1973) and Meade (1996, 2001) list three and Akers (1981) lists five. Wassink-Beckford (2001) argues that these disparate accounts of the segmental inventory may stem partly from sampling errors. In particular, she argues that in some cases speaker samples were not controlled for sociolinguistic factors such as socioeconomic class, speech style and gender which are known to have effects on speech. In other cases, no distinction is made among speakers from different levels of the speech continuum. That is, basilectal, mesolectal and acrolectal varieties are pooled together so that a distorted picture of the linguistic system is created. Irvine (1994), points out that in linguistic research on creole continua, it is essential for the researcher to control for variation. The key point is that in creole continua, social dialect differences as observed between the basilectal, mesolectal

¹¹ Akers (1981) does not include /v/, so that the total number of consonants he reports is 22.

and acrolectal varieties in JC could translate into considerable phonological variation. As discussed in Chapter 3, the selection criteria for the informants whose speech is described in this dissertation ensured that the phonological descriptions given are representative of a basilectal variety.

4.3. Prosodic Structure

4.3.1 Syllable Structure

The basic syllable structure which is assumed for the JC data described in this dissertation is as shown in (54) below.

(54) (C(C)) V(V) (C (C) (C))

This structure reflects the fact that the syllable in JC obligatorily has a nucleus which may be complex, being comprised of a long vowel or diphthong. In addition, syllables may have a complex onset and up to three segments in the rhyme. Representative examples of possible syllable structures are shown in (55);

(55)	nak	‘knock’	CVC
	skiet	‘skate’	CCVVC
	daag	‘dog’	CVVC
	klaʃ	‘clash’	CCVC
	taŋks	‘thanks’	CVCCC
	ma:.mi	‘type of fruit’	CVVCV
	ma.ka	‘prickle, thorn’	CVCV
	a:.ba	‘trellis’	VVCV

4.3.2. Foot Structure and Moraicity

Based on the discussion of JC stress facts in section 4.4, we will see that JC forms trochaic feet. We will also see that moraic structure is important in stress assignment as the language is quantity sensitive. That is, stress is typically assigned to bimoraic, i.e. heavy, syllables and it is only in the absence of a heavy syllable that a light syllable is stressed. Following Hayes' (1989) treatment of syllable weight and moraicity, I assume that coda consonants in JC contribute to syllable weight. Heavy syllables contain maximally two moras and therefore include syllables with VC and VV sequences which may be comprised of either long vowels or diphthongs. In addition, the data shows that consonants in final consonant clusters or coda consonants in syllables with long vowels or diphthongs do not contribute an additional mora to syllable weight, effectively ruling out super heavy syllables in JC. That is, CVCC and CVVC syllables are just as heavy as a CVC syllable.

4.4. JC Word-Level Prosody

The primary goal of this section is to lay out criteria by which to arrive at an adequate characterization of the synchronic word-level prosodic system of Jamaican Creole. There have been several arguments for a characterization of the JC prosodic system as a stress system, a tonal system and as a system that incorporates both stress and tone. Since terms like *stress*, *tone* and *accent* have been used with a variety of meanings in the literature, I will first clarify how they will be used in this and following chapters. I use the term *stress* to refer to the abstract phonological category by which we can distinguish degrees of

emphasis or contrast in sentences or words (Crystal, 1997). I follow Hyman's (1978) basic treatment of *accent* as the marking of a syllable with greater salience than surrounding syllables. However, the treatment of accent adopted here goes beyond word-level accent and incorporates phrase level (intonational) accent as well. As we will see below, within the category accent we can further distinguish between stress-accent and pitch-accent. Finally, the term *tone* is used to refer to the distinctive pitch level of a particular syllable or phrase edge. In section 4.5.1.2, I discuss details of two subtypes of tones, pitch accents and boundary tones. Briefly, a *pitch accent* is a tone (or closely linked group of tones) that is contrastively linked to a syllable, whereas the boundary tone is linked to the edge of a phrase. This broad characterization of tone recognizes that it can be lexically assigned or can be assigned by the intonation to a lexically predefined position in a word such as a stressed syllable.

I examine both phonological and phonetic properties of accent and tonal systems as I outline criteria for prosodic categorization. First, I review the arguments presented in support of the different characterizations of JC prosody and then establish criteria by which prosodic classification can be achieved. Based on these discussions, I present an analysis of the JC word-level prosodic system in subsequent sections.

4.4.1. Previous Analyses of JC Prosody

There have been some proposals to characterize the JC word prosodic system as a tonal system; each of these will be discussed in turn. Lawton (1963; 1968), provides perhaps

the earliest and so far only instrumental (phonetic) analysis of JC prosody. I give an overview of his main points here and revisit them in detail in section 4.5.2 as a basis for comparison with my own phonetic analysis of JC word-level prosody. Using both phonological data and phonetic evidence from tonometer¹² readings, Lawton argued that JC has lexical tone. The tonometer readings involved listening to a tune played on the tonometer and matching it with the perceived tune of the target utterance. Lawton's conclusions are based on analyses of monosyllabic, bisyllabic and trisyllabic words in four different prosodic contexts, i.e. phrase medial, phrase final, phrase initial and isolation. According to Lawton, the test words had the same 'toneme pattern' in isolation as they did in the different sentence positions of the statement intonations in which they were presented. Based on this, he identified 'three relative tone levels (tonemes) that function lexically and phonologically as a basic part of the vowel', i.e. high-level, mid-level and low-level tones. Examples of a small number of minimal pairs are given in (56). In Lawton's work, (^ˉ) represents high-level tone; (^ˋ) high-falling tone and (^ˊ) low-level tone.

- (56) máatà 'mortar' mātà 'matter, mucus'
túutù 'feces' tūtù 'genitals'
bíità 'beater' bītà 'bitter'

¹² The tonometer is an instrument used to control frequency variation in stimulus presentation or to register and measure response. In terms of construction, one model consisted of a series of steel bars, suspended from strings at a distance of 22.4% of the overall length from the ends. The rods vibrate transversely in their fundamental modes when struck with a small hammer. For a set of round rods of constant diameter, the frequency is proportional to the inverse square of the length. The longest bars were audible to everyone, but the shortest had a frequency of 32.8 kHz, inaudible to the human ear.

(http://www2.kenyon.edu/depts/physics/EarlyApparatus/Rudolf_Koenig_Apparatus/Tonometer/Tonometer.html)

All the words with long vowels are said to differ from those with short vowels by having a high-falling tone on the first syllable versus a mid-level tone. According to Lawton, there are no phonemically long vowels in JC since all the phonetically long vowels carry high-falling tone in all contexts such that their length is predictable from the tonal assignment.

Lawton also identified tonal differences in phrases like those in (57).

(57)	míerĩ bráun	‘Mary is brown’	HL	H	HL
	míeri bráun	‘Mary Brown’	HL	L	HL
	kyàŋgò	‘can go’	L	L	
	kyáaŋgò	‘can’t go’	HL	L	

For Lawton stress in JC is not significant for distinguishing lexical items and is predictable in terms of tone. He stated further that stress occurs initially on all two-syllable free morpheme nominals regardless of whether the tone is high-falling or mid-level and that final syllables are unstressed.

Sutcliffe (1986) also argues that JC is tonal, though not in the same way as Lawton. He claims that an important part of the morphosyntactic system is expressed through tone or significant pitch. The analysis is based on data from 45 male and female speakers of Jamaican descent in Dudley, in the West Midlands of England. The speakers were second generation Jamaicans ranging in age from 16 to 23 at the time of the recording. Sutcliffe reports that the speakers were able to switch between a local variety of British English and a basilectal Creole variety. He refers to this as ‘patois’ or British JC and maintains that BJC is JC despite changes over the generation. Most importantly, he claims that BJC shows the same patterns of tonality as JC that would be found in the speech of Jamaican born speakers. It is not entirely clear what Sutcliffe means when he

says JC is ‘tonal’, though he seems to equate tone with pitch. On the one hand, he claims that *lexical tone*, is either rare in JC or possibly non-existent. On the other hand, the paper discusses how putative tone in BJC expresses grammatical relations, i.e. grammatical tone. Alleyne (1980) has a similar view that ‘tone’ functions only at the grammatical level in Jamaican. Sutcliffe claims that ‘nouns, adjectives and lexical verbs alter tone according to their function as well as position in the sentence’. This suggests an interpretation in terms of intonation patterns, that is, prominences associated with different words based on sentence position and intended meaning. In fact, Sutcliffe argues that ‘tonality is involved in the expression of sentence type and is affected in actual realization by the rhetorical intent of the speaker’ e.g. a preceding tone is realized as H if its underlying tone is H and !H if the underlying is a L tone. At the same time, Sutcliffe adopts Carter’s (1982) position that JC operates on a 2 tone system (L and H), to yield upstepped, downstepped, LH and HL tones.

Carter’s research on JC prosody (1979, 1982, 1983, in Holm, 1988) has oscillated between a characterization of JC as tonal and a characterization as pitch-accent or stress-accent. In her 1979 work (cited in Carter, 1983), Carter argues that CECs including JC exhibit some features typical of African tone-languages, for example, *downdrift*. The main thesis of this earlier work was that the precise nature of these retentions of African language prosodies was as yet undetermined and further that they may not be the same across the CEC languages. In her 1982 paper, Carter concluded that tone-patterns in JC were the property of the phrase or ‘tone-group’ (Holm, 1988:143). These tone-groups were said to show patterns of pitch polarity, meaning high and low tone alternated so tone

depended on where a word fell in the alternation. This yielded differences in the pronunciation of names such as *Pául Nelsón* compared to *Kévin Nélsón*. This analysis was based on the speech of a Jamaican-born student residing in Britain whose speech was characterized as ‘educated Jamaican English’. Carter’s (1983) article is a critique of evidence presented in support of the categorization of CECs as tonal, thereby reversing her earlier classification. Most of the evidence evaluated is from Allsopp (1972 in Carter, 1983). She concludes that though there does not seem to be sufficient evidence for classifying CECs as tonal, the evidence seems to point to a pitch-accent or intonational interpretation. Carter points out that even the most convincing evidence for tonality in CECs, minimal pairs, is inadequate since it is not clear whether the patterns are attested only in citation form or whether they are maintained in contexts and if so which contexts¹³. She argues that in the absence of distributional evidence one cannot properly evaluate whether the distinction is tonal or further evaluate the contribution of context information to the observed pitch patterns.

A second set of research characterizes JC prosody as a stress-based system. Wells’ (1973) work, *Jamaican Pronunciation in London* is based on data from 36 Jamaican-born Londoners who had been in London between 4 and 14 years. The informants ranged in age from 18-42 and were originally from 11 of the 14 parishes in Jamaica. They were grouped by occupation as manual (roughly working class) and non-manual (middle class and up). Wells carefully noted that his study was not a study of Jamaican Creole but rather of the adapted form of speech used by Jamaicans in London

¹³ Carter (1987) essentially agreed with Allsopp’s (1972) findings that there are tonal contrasts in Guyanese Creole.

(pg. 30-31). The research focused on segmental phonology but Wells discussed prosody in his background information on the language. Wells described JC prosody as a stress-based system and clearly stated that stress is contrastive. He claimed that in disyllabic words stress usually falls on the second syllable if it has a long vowel, diphthong or more than one coda consonant, otherwise, stress falls on the first syllable. In the following examples, stress is marked by (').

(58) a'lou 'allow'; kri'tʃoul 'owl'; ka'ment 'comment'; 'kunu, 'kanu 'boat'

Wells also identified exceptions such as, *kobel* 'noise of a quarrel, din'; *depan* 'keep on, be on'. He also noted that the word level stress is affected by a 'characteristic Jamaican intonation phenomenon which has the effect of shifting the surface stress by one syllable' (pg. 20), for example, the word *'kitʃin* 'kitchen' has initial stress but in a (declarative) sentence becomes *ki'tʃin*. Like Lawton (1963), Wells reported that the stressed syllable has a high falling pitch. He evaluated claims made by Bailey (1966 in Wells, 1973) regarding the presence of a tonal contrast in *kyan* 'can' (low tone) and *kyaan* 'can't' (high tone). According to Wells, his Westmoreland informants accepted identical intonation patterns for both words. This was also confirmed by observations of the informants' use of the words in discourse where both words occurred with a high pitch. Wells hypothesized that the two words are homophonous and further that *kyan* 'can' was unaccented and *kyaan* 'can't' was accented. The accented form, he claimed, is used when the word must be made contrastive and always has a negative meaning and the unaccented word a positive meaning. With regard to sentence intonation, he adopted

Bailey's (ibid) three-way division of pitch contours, i.e. falling, rising and high-level. According to Wells, the rising contour (↑) is used in questions, interrogative and imperative tags and non-final clauses, as in *ju ʔwa:nt it ʔi:t it* 'if you want it, eat it'. In addition, non-final main clauses may have a fall (↓) as in *eniwie mi wi ʔi:t it wails mi ʔwa:n i* 'anyway I'll eat it, provided that I want it' (pg. 24). There is also a high-to-mid fall (↓↓) which may be a variant of the high-level contour and is seen in rhetorical statements for example, *no ʔstju:pidnes dat* 'that's ridiculous!'. Finally, Wells noted that structural ambiguity may be resolved by 'appropriate tonality as in standard accents', as seen from the following examples.

(59) *no plaf di ʔwa:ta pan mi bwai* 'don't splash the water on me, boy!'
no plaf di ʔwa:ta pan mi ʔbwai 'don't splash the water on my boy!'

I should point out that Wells' use of the term 'tonality' here refers to differences in the F₀ contours associated with phrasing and not to lexical tone contrasts.

LePage (1960) and Cassidy and LePage (1967) also mention that JC has a stress system but the matter is only dealt with cursorily. A more in-depth treatment is offered by Alderete (1993) who assumes Cassidy and LePage's (1967) classification of JC prosody as stress-based. He presents a phonological analysis of the system. Alderete argues that primary stress tends to fall on a heavy syllable and where there are no heavy syllables, the first light syllable in the word is stressed as seen in the examples in (60).

(60) 'duo.duo	'sleep of children'
'kre.be	'something odd'
ni.'glet.fl	'neglectful'
'dzim.bi.lin	'type of tree'
'kra.ka.sa	'fan palm'
'ba.ni.kle.va	'curdled milk'

Further, secondary stress falls on the third syllable of a trisyllabic word if it is heavy but is not stressed if it is light. A quadrasyllabic word with all light syllables gets secondary stress on the penultimate syllable as in (61).

(61) 'baa.bi. kyuu	'rectangular platform'
'ba.ni. kle.va	'curdled milk'

Finally, in a later work, Allsopp (1996) argues that although general homogeneity cannot be claimed for Caribbean English (CE) with respect to the prosodic systems, there is a general sense in which a 'West Indian accent' is distinguishable for others. Allsopp claims that the most distinguishing feature is the phrasal intonation. He claims that the separation of syllabic pitch and stress in CE is a major factor of difference from other Englishes like American English and British English. He notes (though incorrectly so) that whereas stress tends to be coincident with high pitch in Standard English (SE) varieties, like American English and British English, these are usually separated in general CE. Notice that Allsopp assumes that the same syllable is stressed in SE as in CE. It appears that for him both varieties are similar with regard to where stress is located but differ in their phonetic manifestation of stress. Cassidy and LePage (1967) have a similar view of

stress in JC. They claim that stress and (high) pitch are not coincident but rather that high pitch precedes the stressed syllable in JC.

A third characterization treats JC prosody as a mixed system. To my knowledge, Devonish's work (1989) is the only explicit treatment of JC prosody as a 'mixed' system. Devonish (e.c.; 1989) claimed that the prosodic system of JC consists of a lexically assigned HL melody, as well as an HL melody associated with word initial syllables in addition to stress/segmental prominence associated with all syllables bearing surface HL melody. Further, prominence is realised in stress-like ways in JC, mainly in terms of extra length for prominent syllables and in the assignment of an HL melody. Whether the first prominence in a word is located on the first or the second syllable is lexically determined. In addition, whether or not the word has a second prominent syllable is also lexically determined. These hypotheses are formalised in Devonish (2002) where he argues that CECs with a basic 5-vowel system like JC are restricted tone languages with a single underlying H tone and a surface HL tonal melody. He classifies these languages as tone-driven stress systems, i.e. having prosodic systems in which both tone and stress interact.

There are some difficulties with these earlier classifications of JC prosody. First, some of the classifications are based on insufficient data or in some cases, claims are made without supporting data. Another data problem is the failure to isolate the Creole varieties in the analyses. In some cases it is not clear what variety of JC is being dealt with, in other cases the analyses are based on Jamaican English, yet statements are made about JC as a whole. As discussed in chapter 3, this is problematic since there are significant

phonological differences among the basilectal, mesolectal and acrolectal varieties in the JC language continuum. Finally, with the exception of Lawton (1963) and Devonish (2002) these studies are largely based only on impressionistic (auditory) analyses and could benefit from instrumental analysis to support the claims made.

Second, some classifications are too global in that they group all CECs together. Carter (1983) and Allsopp (1996) hinted that the prosodies may not be uniform across the languages. Devonish (1989, 2002) presents sociohistorical evidence that there is a split in the development of the synchronic prosodic phonologies of CECs¹⁴ which created, on the one hand, languages like Guyanese, Ndjuka and JC with *tone-driven stress* systems (my term) and, on the other, languages like Saramaccan and Berbice Dutch with *stress-driven tone* systems (my term). My interpretation of the two types of CEC languages stems from the following statements:

I suggest that two clear options faced the speakers of early Anglo-West African. The first of these was to assume that the...HL melody was primary, with segmental prominence being assigned to the syllable bearing the HL melody (2002: 52).

and in the second option;

Every word would have a HL melody assigned to it...automatically to the segmentally prominent syllable.. (ibid: 52).

Third, some characterizations are one-sided in that they present only phonetic data without phonological data or vice versa. This leads to a fourth problem which perhaps stems from a failure to recognize that the use of pitch is not an exclusive property of tonal systems as it is also used in stress-accent and pitch accent systems as well. Sutcliffe

¹⁴ Other researchers (cf. Alleyne, 1980) have noted the independent development of Caribbean Creole varieties.

(1986), for example, seems to equate the presence of pitch differences between words with tonality. Alleyne (1980) notes that in some 'Afro-American dialects, there is very little agreement as to the analysis of suprasegmental features such as pitch, stress and length.' He attributes lack of agreement to 'the fact that all three (features) are often present and the selection of one rather than another as a distinctive feature depends on the perspective of the analyst.' One caveat is that at the time Lawton conducted his study, researchers tended to equate 'stress' with intensity, loudness or increased effort on the part of the speaker. Furthermore, for Lawton tone meant a 'contrastive use of pitch' so that '**any** (my emphasis) language that has pitch (tone) contrasts..' was classified as a tonal language (pg. 18). However, Scott (1939), Fry (1955, 1958), Lehiste (1961), among others, showed that for languages such as English and Serbo-Croatian the phonological categories such as stress and accent are related to acoustic cues other than intensity, i.e. fundamental frequency, duration, spectral characteristics of the vowel. More recent studies replicated these results in a wide range of languages and, most importantly, showed varied results for the intensity cue, indicating that intensity was not as reliable as other cues to stress and accent. Still, it is significant that most of the later studies on JC prosody appear not to have made this adjustment in their analysis of the prosodic system. An adequate study of JC prosody needs to reflect scholarship on the subject that will help to establish criteria for deciding along what parameters systems differ when they do not have lexically contrastive tone specifications. As I suggest below, this comes from an examination of both the associated phonological and phonetic properties.

4.4.2. Criteria for Prosodic Classification

There are several ways in which stress differs from both tone and pitch accent and thus there are several factors which can be used as a basis for classifying the prosodic system of a language as one of these systems. I first discuss phonological factors and then phonetic factors.

First, stress is *culminative* in the sense that each content word has a metrically strong syllable that bears main stress (Hayes, 1995; Kager, 1995). Second, stress is *alternating* by nature. This has to do with rhythmic distribution by which adjacent stresses are avoided (Kenstowicz, 1994; Kager, 1995), e.g. ra'coon + 'coat ---> *ra'coon'coat*. In this example, the stress on the syllable 'coon' would be adjacent to the stress on the word 'coat' in the compound, i.e. *ra'coon'coat. As a result, the stress on 'coon' is shifted one syllable to the left so that the stress pattern on the compound is a rhythmic sequence of stressed-unstressed-stressed syllables. So, syllables bearing stress tend to occur equally spaced apart, and further, unlike tones, stress does not assimilate, as this would produce sequences of stressed syllables (i.e. clashes). Third, stress is *hierarchical*; most of the languages surveyed tend to have different levels of stress, i.e. primary, secondary, tertiary etc. (Hayes, 1995; Kager, 1995). Fourth, stress contrasts tend to be manifested segmentally, for example, by vowel or consonant lengthening (Kenstowicz, 1994; Kager, 1995) and conversely the lack of stress may be manifested in systematic vowel reduction.

With regard to the phonetic properties, it has been noted that stress is perhaps the most 'elusive' phonological entity (Kenstowicz, 1994) and that there are no invariant

cues. Beckman (1986) also mentions that it is expected that languages will vary in their phonetic manifestation of stress, just as with the phonetic implementation of other phonological categories like voice. Cross-linguistic research on the phonetic properties of stress has shown however, that stress is realized through phonetic properties such as fundamental frequency (F_0), duration, vowel duration and intensity. Prominent syllables potentially have longer durations, higher intensities and specific pitch movements associated with the perception of prominence. According to Remijsen (2001), we can distinguish three word-level prosodic categories, on the basis of both phonological characteristics and phonetic encoding. That is, while pitch-accent is encoded by the F_0 pattern, stress can be realized by means of other acoustic parameters such as vowel quality, duration and intensity as well as by the association to pitch accent or tone. Beckman (1984, 1986) makes a distinction between *stress-accent* and *non-stress-accent* languages based on the degree to which they utilize phonetic properties other than the tone (F_0) pattern as cues to prominence. Further, in both pitch accent and stress accent languages, there are differences in the F_0 pattern of words. Whereas in pitch-accent languages the shape of the F_0 pattern of words is fixed at the lexical level, it is variable in stress languages where the F_0 contour of the word is determined at the phrasal level by intonational patterns with a pragmatic meaning (Ladd, 1996). Furthermore, since the phonological categories 'pitch accent' and 'stress' are independent we can observe different types of interactions across languages, yielding at least four different groupings. That is, languages can have both stress and lexically contrastive pitch accents (e.g. Serbo-Croatian, Swedish); or stress with intonationally contrasting pitch accents (e.g. Greek,

Jordanian Arabic, English); lexically contrasting pitch accents without stress (e.g. Japanese) or finally neither stress nor pitch accents (e.g. Korean) (cf. DeLacy, 2002)¹⁵.

In contrast to stress, lexical tone is contrastive in a paradigmatic way while both lexical pitch-accent and lexical stress are syntagmatically contrastive, if at all (Beckman, 1984; 1986; Remijsen, 2001). Phonetically, lexical tone and lexical pitch-accent are similar in the sense that both are encoded by means of F_0 . Stated in another way, pitch accent languages are *tonal* at the lexical level, so they must satisfy the criterion of having invariant tonal contours on tone-bearing syllables since the tone is a lexical property (Hayes, 1995). Conversely, the tonal contour of accented syllables in stress languages can vary freely as they need not be a part of the lexicon but may be assigned by the intonation.

Beckman (1986) and Kenstowicz (1994) also mention other properties of stress. First, the perception/judgement of the native speakers is different with regard to stress and tone. The perception of tonal contrasts tends to be inextricably linked to segmental contrasts whereas the perception of accentual contrasts is not linked to segmental specifications. Second, tone and accent have different historical developments. According to Beckman (1986) tonal oppositions function like segmental oppositions (i.e. paradigmatically) because they develop historically from segmental oppositions, whereas accentual contrast are removed from segmental oppositions since they develop from culminative reanalyses of other suprasegmental patterns (pgs. 35-36).

¹⁵ I consider DeLacy's discussion of tone-driven *stress* systems and stress-driven *tone* systems to be similar in spirit to the classifications I make here.

The hypothesis which I propose here, is that JC falls into the category of stress-accent languages since tones are associated to prominent syllables and are necessarily accompanied by other phonetic cues to prominence. One indicator of syllable prominence identified in this research is the alignment of the F_0 contour with the word. As in other stress systems, we will see that stress in JC is lexical, predictable and it alternates. Furthermore, the JC stress system is largely of the variable, quantity-sensitive and bounded variety.

4.5. Evidence for Stress in JC

Supporting evidence for categorizing JC as a stress system comes from two main sources, strong native speaker intuitions from four informants (including the author) and the phonetic data I discuss further below. I used the Dictionary of Jamaican English (DJE) (Cassidy and LePage, 1967) as the initial source for stress assignment in JC. This was bolstered by native speaker intuitions on syllable prominence in each word. Each of the words taken from the DJE was elicited from the informants to cross-check for consistency in the DJE notations for syllable prominence. In cases where there were differences, I relied on native speaker intuitions. The informants were also asked to judge the perceived strength of syllables in polysyllabic words as well as the appropriateness of pronunciation for words with prominences in varied locations e.g. baRAmpa vs. BAraMpa vs. baramPA ‘rattooned ginger root’. In the sections below I show phonetic evidence in support of the hypothesis that JC has a stress system. As demonstrated, the phonetic difference between lexically contrastive words is attributable

to differences in the alignment of the F_0 pattern with the word rather than to different tone shapes. In section 4.5.1 I give a brief overview of the theoretical assumptions and the elicitation techniques (section 4.6.2) used for data collection. I will motivate these further below in section 4.6.

4.5.1. Theoretical Assumptions

4.5.1.1. Prosody

The view of prosody adopted here is directly in line with the phonological properties of stress outlined in the previous chapter as well as with the metrical theory of stress introduced there. Following the assumptions of metrical theory, I treat the prosody of an utterance as a hierarchically organized structure of phonologically defined constituents such as the syllable, foot, prosodic word etc. That is, prosody is crucially not synonymous with suprasegmental features but is rather an organizational structure (Beckman, 1996). From this perspective, we can view pitch accents as components of prosodic constituents such as the syllable and we can view different levels of stress, i.e. primary, secondary etc. as differentials in the levels of prominence contrast for these prosodic constituents. Potential ambiguities such as that observed for intensive and distributive reduplication, can therefore be resolved by reference to the prosodic organization of prominent syllables in the word. As noted above, we can define a *pitch accent* as a tone (or closely linked group of tones) that is contrastively linked to a syllable (Beckman, 1996: 30). Since in a stress language, pitch accents are anchored to metrically strong syllables, if these syllables are

organized differently in different words then the alignment of the associated F_0 will necessarily differ.

In the following section, I discuss some phonetic evidence supporting the hypothesis that the word-level prosodic system of JC is a stress-accent system. I argue that JC has a typologically similar intonation system to other stress-accent languages like Russian, German and English. As such, we can predict that the F_0 pattern associated with stressed syllables will vary depending on the prosodic context and the intonation. Further, this typological classification predicts that JC has no lexically contrastive tones (pitch accents) which can contribute a fixed shape to the F_0 contour. I assume that JC has a grammar of pragmatic tone morphemes, *pitch accents*, that are aligned with the head syllables of prominent feet. A complete analysis of the intonational system of JC is beyond the scope of this dissertation. However, for purposes of the ensuing discussion I assume, based on the data presented, that there are at least two pitch accents, H^* and $H+L^*$ and two boundary tones $H\%$ and $L\%$. I describe these in more detail just below.

4.5.1.2. Notations

The analysis of word-level prosody presented in this chapter follows in general the autosegmental approach to intonational phonology (Beckman and Pierrehumbert, 1986). One of the central tenets of this theory is that in English and other typologically similar languages, pitch accents (tones) are associated with words in a specific way, the main condition being that the pitch accents are aligned with prominent, i.e. metrically strong

syllables. As we will see in Chapter 5, where JC is concerned this is typically a heavy syllable, though there are also stressed light syllables. The tones associated with stressed syllables are the ‘starred’ (*) tones and as such we can refer to the associated syllable as *accented*. Pitch accents can be monotonal (e.g. H*) or bitonal (e.g. H+L*), where the asterisk (*) marks the tone associated with the stressed syllable. Other tones like the boundary tone are aligned with the edge of phrases. For example, the low pitch contour at the end of statements is marked with L% and the high pitch contour at the end of questions is marked with H%.

4.5.1.3. F₀ Plots

Figure 4.1 is a graph plot of fundamental frequency (vertical axis) over time (horizontal axis). As shown here, statements in Jamaican Creole of the sort analysed in this chapter typically show movement in pitch from a high point to a low point (dotted line), whereas questions typically have a pitch movement from a low pitch to a high pitch (solid line).

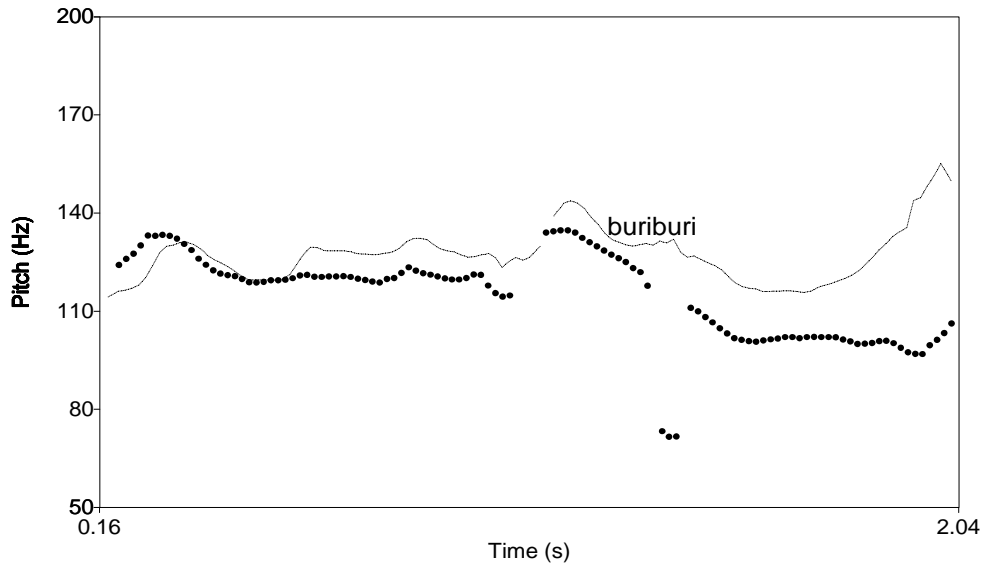


Figure 4.1: F₀ contour of the statement *Mieri want wan buriburi wan* ‘Mary wants one that has burrs all over’ (dotted line) and the related question *Mieri want wan buriburi wan Does Mary want one that has burrs all over?* (solid line).

The graphs discussed in this and ensuing chapters were made using PRAAT 4.026 and are annotated as illustrated in Figure 4.2.

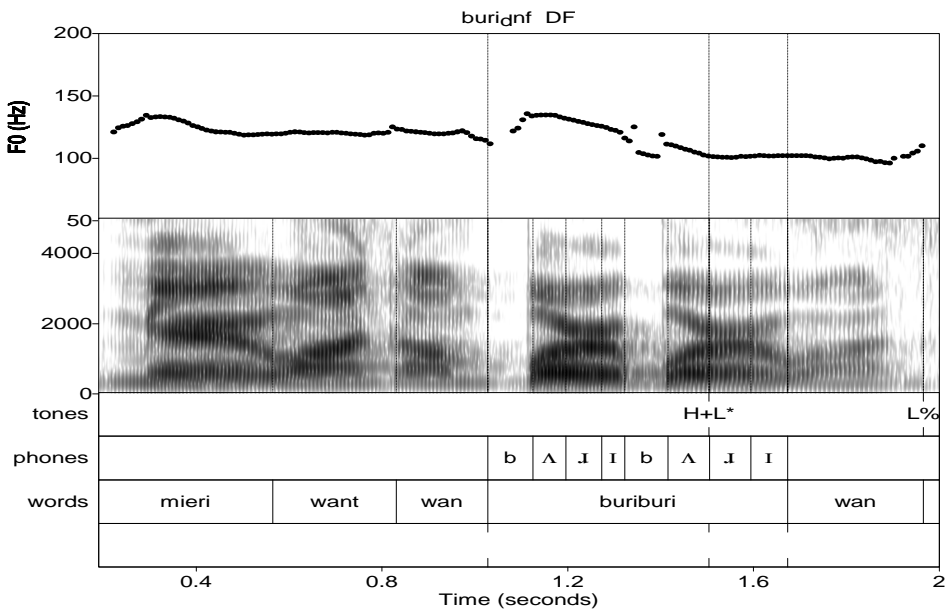


Figure 4.2: Annotation conventions

In each graph, the portion of the F_0 associated with each target word is marked off by vertical bars on the F_0 traces (top row). A spectrogram (middle row) shows word segmentation for the entire utterance and phone segmentation for the target word; these are identified by vertical bars. The bottom row has transcription information on different tiers; pitch accents (tone tier), phones in broad phonemic transcription (phones tier) and words in a slightly modified version of the Cassidy and LePage (1967) writing system (words tier). With regard to the tones tier, the notation H^* and $H+L^*$ are used to denote the two types of accents illustrated in the data. These are placed at the end of the syllable on which the accent is located. The boundary tones, $L\%$ and $H\%$ are placed at the end of the utterance.

4.5.2. Tone or Stress: F_0 Pattern in Bisyllabic Words

The set of words I examine in this section have been classified as having contrasting tonal patterns and which I have analysed as having a strong-weak versus weak-strong stress pattern, for example, '*faada* 'father' contrasts with *faa'da* 'male religious leader'. As I discuss in Chapter 5, the strong-weak stress pattern in these words is consistent with the stress pattern in other bisyllabic words with an initial heavy syllable, e.g. '*baabi* 'type of yam' or with two light syllables, e.g. '*maka* 'prickle, thorn'. In both cases, stress is assigned to the initial syllable. The contrasting cases with a weak-strong stress pattern are analysed as having lexically specified stress patterns since they do not reflect the regular pattern. The main issue which will be addressed here concerns the shape and the alignment of the F_0 contour associated with these words. I illustrate using the pair of

words *'mada* 'mother' and *ma'da* 'female religious leader' since the initial segment is a sonorant and does not cause perturbation of the F₀ contour as would the initial obstruent of *'faada* 'father' and *faa'da* 'male religious leader'.

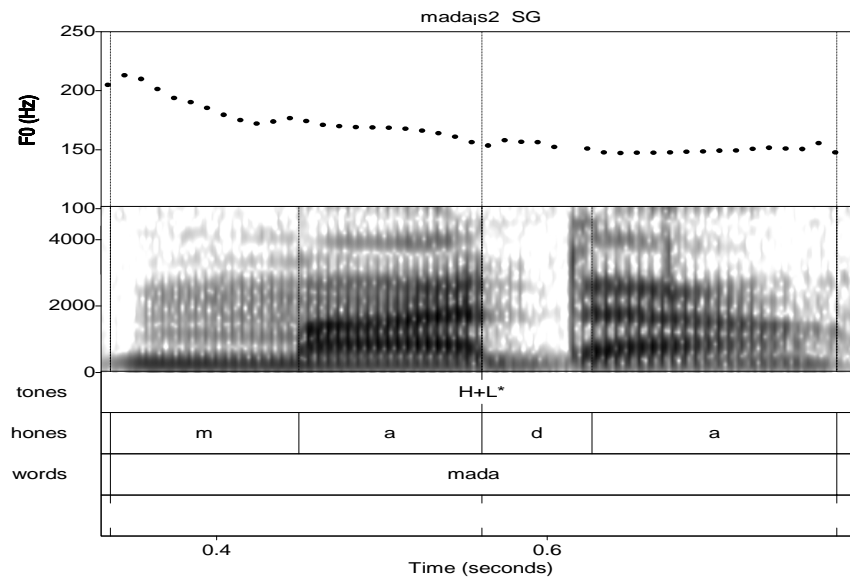


Figure 4.3: Fundamental frequency contour (upper panel) and spectrogram (lower panel) of the word *'mada* 'mother' produced in isolation. This word has primary stress on the initial syllable.

As we see in Figure 4.3 there is a transition from a high pitch to a low pitch on the initial stressed syllable of the word. As we see below, this F₀ pattern is maintained in both final and non-final position in statements (Figure 4.4).

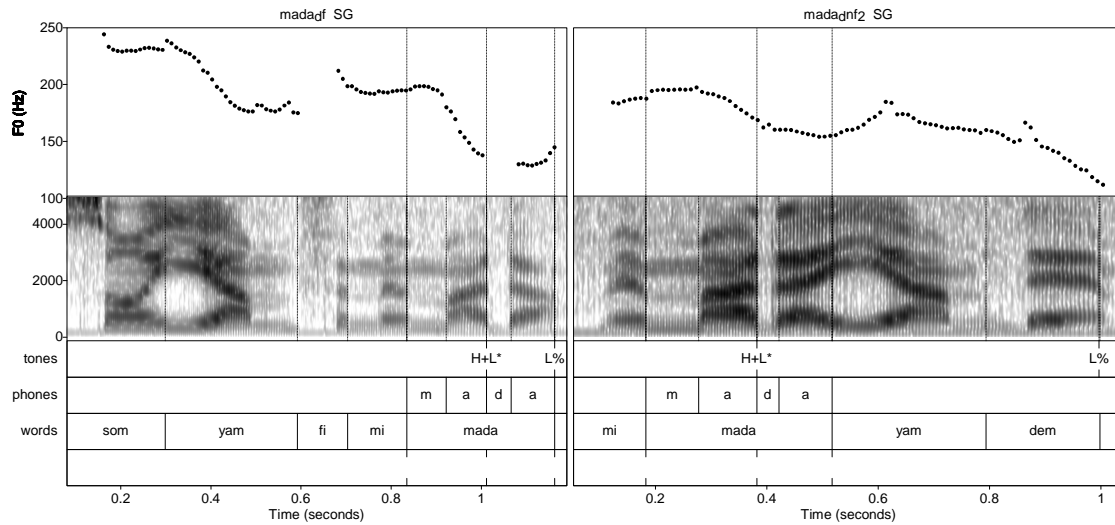


Figure 4.4: Fundamental frequency contours (upper panels) and spectrograms (lower panels) of the word *'mada'* 'mother' produced in statement intonation in final position *som yam fi mi mada* 'Some yams for my mother' (left graph) and in non-final position *mi mada yam dem* 'My mother's yams' (right graph).

As with the citation form shown in Figure 4.5, when the word is final in the sentence (nuclear position), there is a fall in pitch on the initial stressed syllable (left graph). When the word is not final in the sentence (prenuclear), the same fall in pitch is observed on the initial syllable and the low pitch is extended over the words that come after it (right graph). Notice also that in all cases the high portion of the F_0 pattern is within the same syllable as the fall. I transcribe this pattern as H+L*, the starred tone indicating that it is associated with the stressed first syllable.

When we examine the word *'mada'* in question intonation some differences are observable. Figure 4.5 shows the word in final and non-final position.

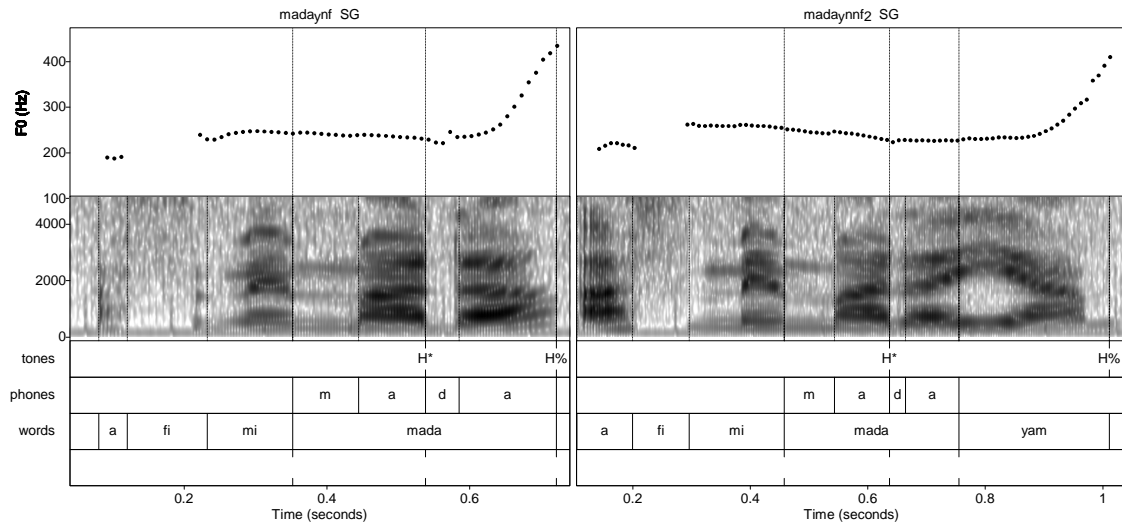


Figure 4.5: Fundamental frequency contours (upper panels) and spectrograms (lower panel) of the word *'mada'* 'mother' produced in question intonation in final position *a fi mi mada* 'Is it my mother's?' (left graph) and in non-final position *a fi mi mada yam* 'Is it my mother's yam?' (right graph).

Producing sentences in question intonation involves raising the terminal F_0 contour to a high point (an upturn), i.e. a high boundary tone (H%). As we can see, the fall in pitch onto the stressed syllable which was observed in the other contexts is absent here. Instead, there is a high pitch associated with the stressed syllable which is then raised even higher for the high final contour of the question intonation. (I treat this as a high pitch because they correspond to the high pitch points in this speaker's speech in statement intonation, which both cases are at or just above 200 Hz. This shows that the utterance in question intonation is produced in a higher overall pitch range than the one in statement intonation). A similar pattern is observed when the word occurs in non-final position with question intonation and in this case the high pitch is extended to the following words before the final rise of the question intonation.

In the next set of examples, I examine the word *ma'da* 'female religious leader', which has a weak-strong stress pattern, in these same contexts. Figure 4.6 shows the word in citation form.

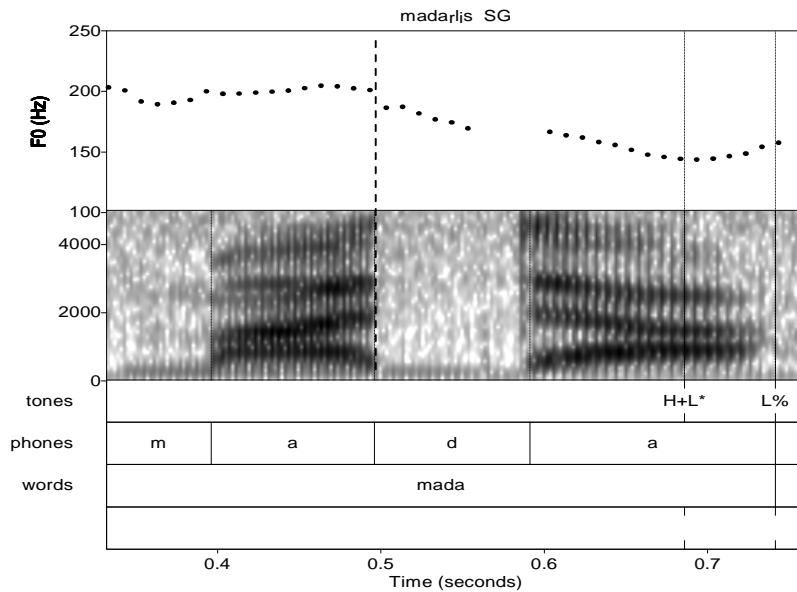


Figure 4.6: Fundamental frequency contour (upper panel) and spectrogram (lower panel) of the word *ma'da* 'female religious leader' produced in citation form. This word has primary stress on the second syllable.

As we can see there is a fall in pitch into the stressed second syllable. In this case, the high portion of the F_0 is in the preceding unstressed syllable. I analyse this as a H+L* pitch accent, the low portion of which is anchored to the stressed second syllable. A similar pattern is seen when the word occurs in final and non-final position in statement intonation as seen in Figure 4.7.

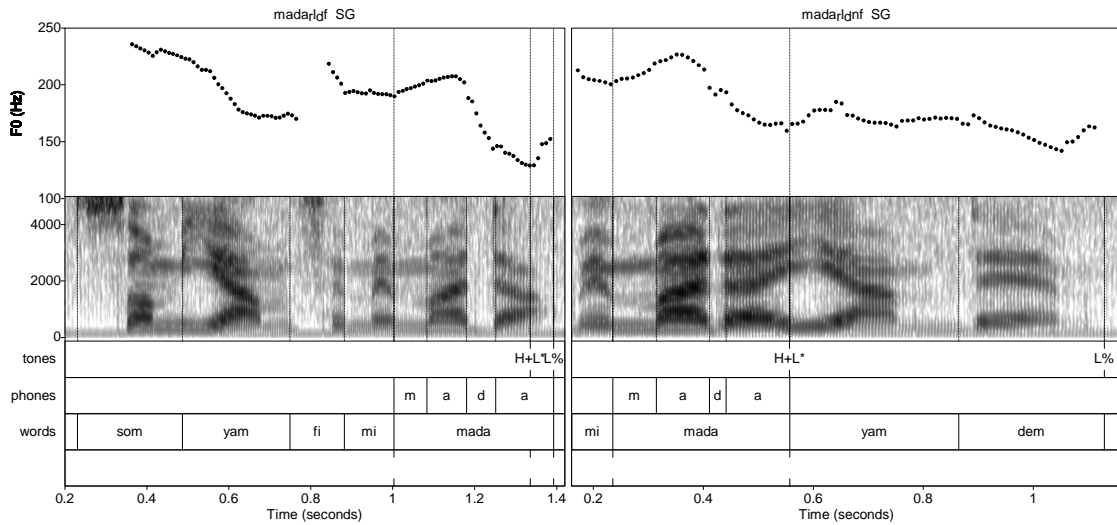


Figure 4.7: Fundamental frequency contours (upper panels) and spectrograms (lower panels) of the word *ma'da* 'female religious leader' produced in statement intonation in final position, *som yam fi mi mada* 'Some yams for my female religious leader' (left graph), and in non-final position, *mi mada yam dem* 'My female religious leader's yams' (right graph).

In question intonation, the pitch remains relatively high throughout the word and in this case I transcribe the pitch accent on the stressed syllable as a H* (Figure 4.8).

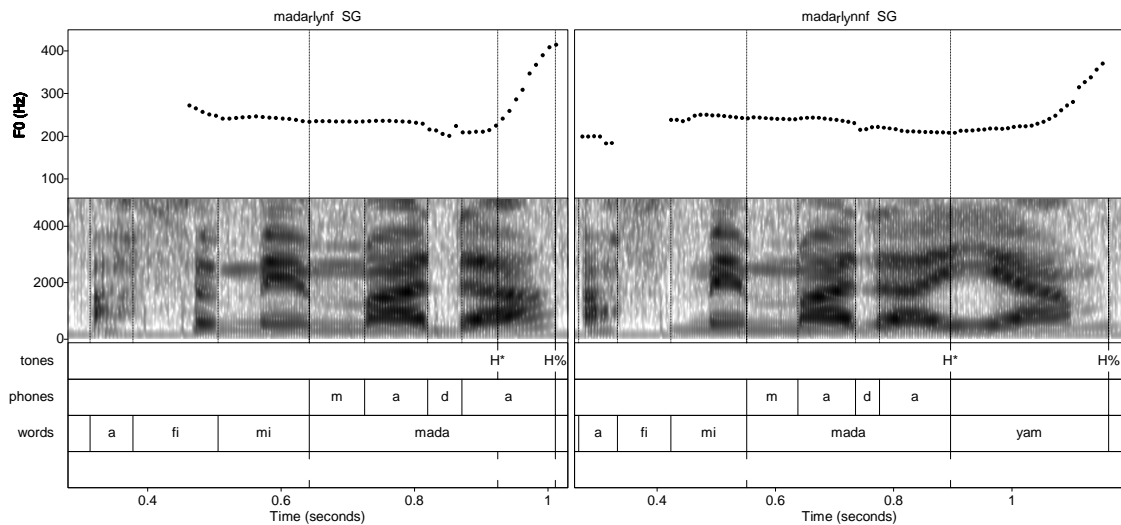


Figure 4.8: Fundamental frequency contours (upper panels) and spectrograms (lower panels) of the word *ma'da* 'female religious leader' produced in question intonation in final position *a fi mi mada* 'Is it my female religious leader's?' (left graph) and in non-final position *a fi mi mada yam* 'Is it my female religious leader's yam?' (right graph).

To summarize, for both words there are differences based on whether the word occurs in statement or question intonation. In statement intonation and in the citation form a H+L* was associated with the stressed syllable and in question intonation a H* was associated with these syllables.

The observed patterns are generally consistent with the pattern seen for other speakers. As I show however, some speakers maintain the F_0 contrast between these words even in question intonation, while some speakers do not. Figure 4.9 through Figure 4.12 show representative examples of *mada* 'mother' (left graphs) and *ma'da* 'female religious leader' (right graphs) in the different contexts produced by RP a 32 year old male.

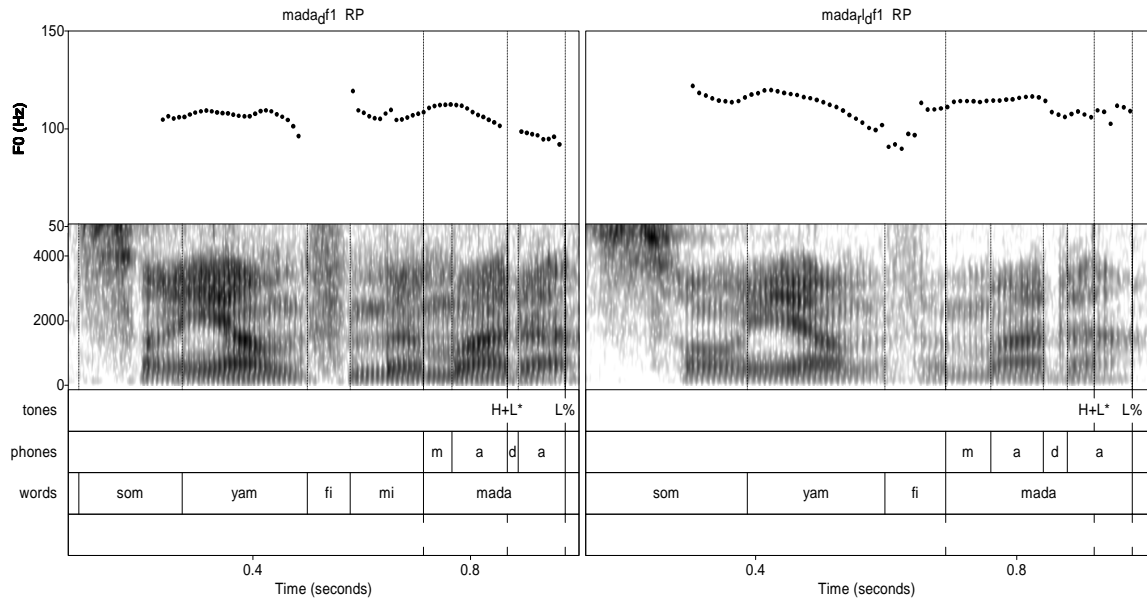


Figure 4.9: Fundamental frequency contours (upper panels) and spectrograms (lower panels) of the word *'mada'* 'mother' produced in statement intonation in final position, *som yam fi mi mada* 'some yams for my mother' (left graph), and *ma'da* 'female religious leader' produced in statement intonation in final position, *som yam fi mi mada* 'Some yams for my female religious leader' (right graph).

As seen in the example above, the H+L* accent is aligned with the stressed syllable in each word. A similar pattern is seen when the word occurs in non-final position in statement intonation, as illustrated in Figure 4.10, and in final position in question intonation as shown in Figure 4.11.

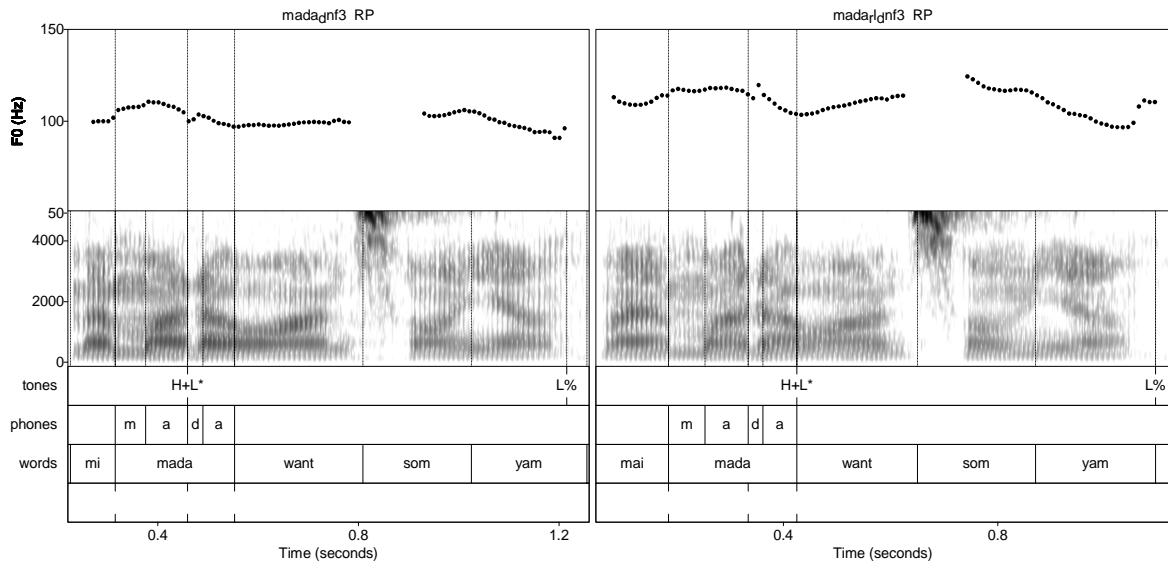


Figure 4.10: Fundamental frequency contours (upper panels) and spectrograms (lower panels) of the word word '*mada* 'mother' produced in statement intonation in non-final position, *mi mada want som yam* 'my mother wants some yams' (left graph), and *ma'da* 'female religious leader' produced in statement intonation in non-final position, *mi mada want som yam* 'My female religious leader wants some yams' (right graph).

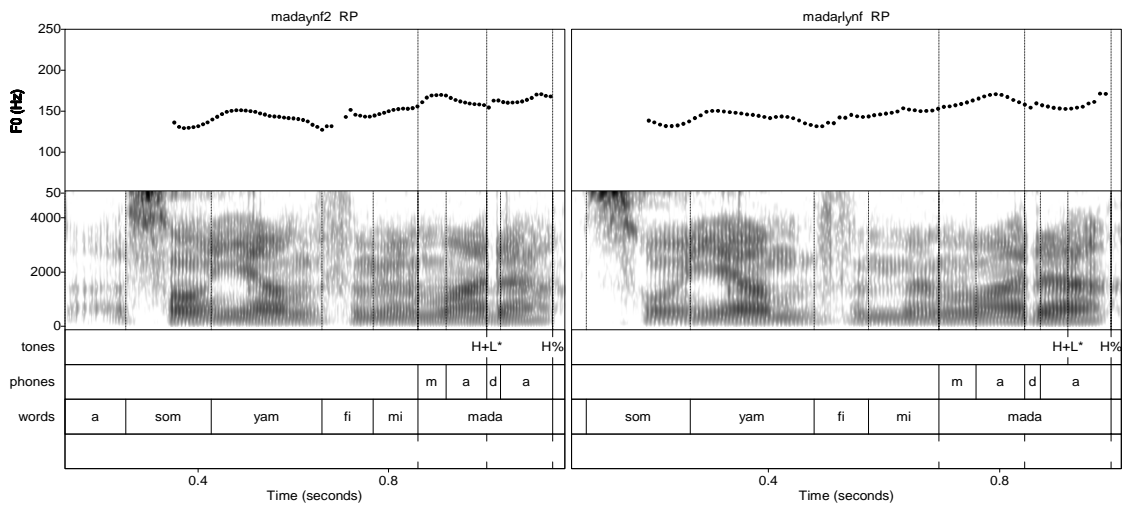


Figure 4.11: Fundamental frequency contours (upper panels) and spectrograms (lower panels) of the word '*mada* 'mother' produced in question intonation in final position, *a som yam fi mi mada* 'Are these some yams for my mother?' (left graph), and *ma'da* 'female religious leader' produced in statement intonation in final position, *som yam fi mi mada* 'Are these some yams for my female religious leader?' (right graph).

Notice that these patterns seen in question intonation for RP are different from the productions of SG shown just above. That is, whereas the H+L* accent is maintained in question intonation in RP's productions, we observed a H* accent in SG's productions. Interestingly the H* accent appears in one production of *mada* when it appears in prenuclear (nonfinal) position in question intonation as shown in Figure 4.12. I take this as evidence that the pitch contrast between the words can be neutralized in question intonation.

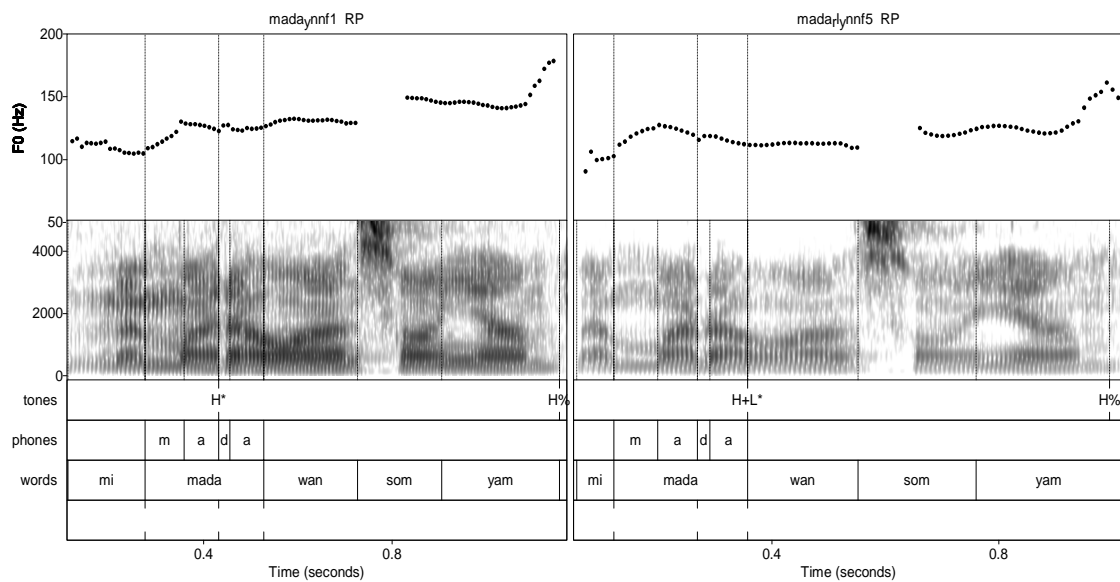


Figure 4.12: Fundamental frequency contours (upper panels) and spectrograms (lower panels) of the word word *mada* ‘mother’ produced in question intonation in non-final position, *mi mada want som yam* ‘Does my mother wants some yams?’ (left graph), and *mada* ‘female religious leader’ produced in statement intonation in non-final position, *mi mada want som yam* ‘Does my female religious leader wants some yams?’(right graph).

4.5.2.1. Summary and Discussion

To summarize, the difference between the words *mada* ‘mother’ and *ma'da* ‘female religious leader’, can be captured in terms of differences in the alignment of a HL F₀ pattern with the word¹⁶. For *mada* ‘mother’, there is a low F₀ target on the first syllable. We see this manifested in the F₀ contours as a fall in pitch into the stressed initial syllable. For *ma'da* ‘female religious leader’, there is also a low tonal target but on the second syllable. In this case we saw a fall in pitch onto the stressed second syllable. In both instances I analysed the pattern as a H+L* pitch accent. It was also noted that in question intonation, the contrast is potentially neutralized since some speakers do not maintain the H+L* accent. These patterns are summarized in Table 4.3.

Prosodic Condition	SW	WS
Citation	H+L* (L%) ¹⁷	H+L* (L%)
Statement final	H+L* (L%)	H+L* (L%)
Statement non-final	H+L* (L%)	H+L* (L%)
Yes-No question final	H* (H%)	H+L* ~ H*(H%)
Yes-No question non-final	H* (H%)	H+L* ~ H* (H%)

Table 4.3: Summary of F₀ Patterns

For *mada* ‘mother’, the H+L* pitch accent is seen in citation form and in statement intonation only, while for *ma'da* ‘female religious leader’, the pitch accent may be

¹⁶ One speaker (84 yr.old female) produced *ma'da* ‘female religious leader’ with a L+H* pitch accent on the stressed second syllable and *mada* ‘mother’ with a L* accent on the stressed initial syllable.

¹⁷ The tones in parenthesis are boundary tones associated with the remainder of the phrase; L% for a statement and H% for a question. Where the target word occurs in non-final position, only the pitch accent on the target word and the final boundary tone are transcribed.

maintained in all contexts. I should also note that the pitch accents are in general not affected by the position of the word in the sentence, i.e. final versus non-final position. There are thus two types of differences between words with a stress-weak stress pattern and those with a weak-strong stress pattern. First, there is a difference in the alignment of the same pitch accent shape within the word in statement intonation and in citation form. Second, there is a difference in the type of pitch accent they permit in question intonation.

Given the data discussed in this section, the idea that there is a lexical tone contrast between words like *'mada* 'mother' and *ma'da* 'female religious leader', is untenable. If there were underlying tones, we would expect to find different F_0 shapes for the tone associated with each word. Further, we would expect to observe each contrasting tone shape/tonal melody in the different prosodic contexts. In fact, we saw that in both cases we have the same HL melody and what differs is the alignment of the pitch fall with the stressed syllable of each word. Based on these data, it is reasonable to expect other lexically contrastive words to exhibit similar differences in the alignment of the F_0 contour with the word. These data also show that phonetically, the stressed syllable in JC is associated with a pitch fall onto that syllable. Since there is no single location for main stress in words, we can predict that the location of the fall will vary depending on the position of the stressed syllable within the word. This is illustrated in the following sections where I examine the F_0 patterns of trisyllabic and quadrasyllabic monomorphemic words and compound words.

4.6. Discovering Contrasting Cues to Word Prosody: Techniques

In chapter 2 we saw many cases in which reduplication created segmentally identical words which were said to have contrasting prosodies. At the same time, we saw that researchers had different views on what prosodic property was being dealt with. In the previous section I presented some evidence that the relevant prosodic property for JC is stress. In this section, I elaborate on the type of methodology undertaken in arriving at this conclusion. First, I review general strategies used to discover contrasting acoustic cues to word prosody in several languages and then in section 4.6.2 I describe the methods of data collection for the JC data discussed herein.

Two forms of stress tend to occur in languages like English, lexical stress and sentence level stress. Lexical stress is concerned with the emphasis of individual syllables in polysyllabic words. Sentence level stress on the other hand is concerned with the stress placed on words in order to indicate (or contrast) their importance/prominence in relation to other words in a sentence. Since my primary concern is with word-level or lexical stress, I focus mainly on strategies used for discovering acoustic cues to stress, accent and intonation as these are directly relevant to the study of JC prosody given that it is a stressed-based system.

In section 4.6.1 I discuss strategies used to discover cues to stress and accent contrast in a variety of languages including, English, Serbo-Croatian, Japanese, Arabic and Greek. In section 4.6.1.1. I discuss the general findings of these studies and then discuss how they apply to the study of JC reduplication in section 4.6.2.

4.6.1. Strategies

Several early experiments were conducted to investigate the phonetic properties of stress contrasts in segmentally identical English words. Among these are Scott (1939), Fry (1955, 1958, 1968) and Huss (1978) among others. One recurring strategy used by these studies is variation of the intonation contour in which the test material was presented while keeping the segmental content constant. The F_0 contour associated with the words could be varied by prosodic context since its shape was not a property of the word as in tonal systems. In this way while the F_0 contour of the sentence frame is varied one can observe whether and how the F_0 contour associated with the target words change.

Scott 1939 for example, conducted an experiment using pairs of English words with contrastive stress e.g. **IM**port (noun), im**PORT** (verb); IN**CR**ease (noun), in**CR**EASE (verb). Scott noted that when these words are spoken in isolation, intonation gives an added clue to their identity but that in some instances intonation does not help in the distinction. Eleven subjects were asked to write down sentences they heard. These sentences had the noun form of the test items in a frame like ‘Are you sure wood-imports would?’ and sentences with verb stress like ‘Are you **sure** wood imports would?’ Scott found that in general listeners were able to get the meaning intended by the speaker. On another occasion, one subject had only 15 out of 24 responses corresponding with the speaker’s intention. Scott concluded that unaided, stress is not very efficient as a distinguishing feature in English (pg. 45).

Fry (1955, 1958, 1965) conducted a series of more elaborate experiments to test the effect of changes in duration, F_0 , intensity and vowel quality on English listeners

perception of stress. The stimuli for these experiments were synthesized tokens of the type seen in Scott's experiment; *object, subject, digest, contract, permit*. In a preliminary experiment, Fry (1955) tested the effect of duration and intensity on the perception of stress and concluded based on his results that duration was a more effective cue to stress than intensity. The second experiment, Fry (1958) tested the effect of F_0 variation in conditions where the influence of sentence intonation was reduced to a minimum. The experiment had synthesized sequences in which F_0 remained constant throughout the syllable and change in F_0 was instead made between syllables. The results showed an effect of changing duration similar to that found in the initial experiment. There was also an effect of F_0 change such that a step-up change of F_0 change caused a smaller percentage of noun responses and a step-down change caused a greater percentage of noun responses. This result supported Fry's hypothesis that if two syllables differ in F_0 , the syllable with the higher F_0 was more likely to be perceived as stressed. While a step change in F_0 affected stress judgments, as long as the results were perceptible as stressed, the magnitude of the pitch change did not affect the perception of stress (pg. 144).

Huss (1978), conducted similar experiments with the same type of noun verb contrast but using natural speech, e.g. *import, decrease, increase, insult*. Like Fry, Huss tested for effects of F_0 , formant frequency, intensity and duration on subjects' perception of stress. The sentential contexts were segmentally identical and were of the type, '*the German's imPORT sinks*' vs. '*the Germans' IMport sinks*'. These utterances were placed into larger contexts in one of the following positions (a) post-nuclear, falling pitch (b) post-nuclear, rising pitch; (c) nuclear, falling pitch, (d) nuclear, rising pitch.

That is, two positions for declarative sentences (falling pitch) and two for questions (rising pitch). Huss found that there was a preference for the noun pattern in the post-nuclear position regardless of pitch, confirming the hypothesis that the lexical stress differences were neutralized in this context. For example, for declarative sentences (falling pitch), nouns had higher 1st: 2nd syllable F_0 ratios given that their first syllable F_0 values were higher. In post-nuclear position however, the first and second syllables of nouns and verbs were at approximately the same F_0 level.

Other acoustic studies were conducted to characterize the attributes of speaker F_0 (Lieberman, 1960; Lehiste, 1961; Bruce, 1977; Beckman, 1986; among others). Lieberman (1960), for example, investigated the importance of changes in F_0 , peak envelope amplitude and duration to the recognition of stressed syllables in English. As in previous studies, the test items were contrasting noun-verb pairs like *contract*, *digest*, *conflict*. Lieberman compared the acoustic values for F_0 , peak envelope amplitude and duration for a stressed syllable to those for an unstressed syllable within a word e.g. *con-* vs. *-tract* in *contract*, and across words e.g. the first syllable of **CONTRACT** with the first syllable of **CONtract**. This was done for all the words which had clearly perceived stress patterns. Lieberman found that the stressed syllables had a higher F_0 than the unstressed syllables in the same word in 90% of the cases; they had higher peak envelope amplitude in 87% and a longer duration in 66%. When he compared syllables across words, stressed syllables had higher F_0 than their unstressed counterpart in 72% of the cases; higher peak envelope amplitude in 90% and longer duration in 70%. Based on these

results, Lieberman concluded that F_0 and envelope amplitude are the most relevant acoustic correlates of stress.

Comparable studies were also conducted with 'pitch-accent' languages such as Serbo-Croatian and Swedish. Lehiste (1961) provided an acoustic phonetic description of four accent types in Serbo-Croatian (Belgrade dialect); short-falling, long-falling; short-rising, long-rising and provided an acoustic-phonetic description of the accent types. Words with the different accent types were pronounced in a sentence frame that allowed words from the same category with different inflectional forms to be alternated in the same position. This allowed for cross comparison of the different words which occurred in that sentence position. The results showed no difference in F_0 patterns for disyllabic words with short-falling and short-rising accents. There was however a difference in three syllable words. For example, for the falling pattern in disyllabic words, the F_0 peak was reached towards the end of the stressed vowel (approx. 66% to 75% of the duration), the fall took place on the second syllable. For the short rising pattern, the F_0 peak was also late in the first syllable but slightly later than in short-falling pattern, i.e. 86% of duration vs. 70%. In three syllable words on the other hand, the F_0 on the second syllable in the short-rise pattern started higher than the peak in the first syllable and the third syllable had low frequency.

Bruce (1977) conducted experiments in Swedish to determine how F_0 is used to signal word accent, sentence accent and terminal juncture. Swedish has two word accents, accent I (acute) and accent II (grave), which are preserved in stressed syllables. The test material consisted of sentence frames in which the following were varied (a)

word accent in different sentence positions (b) sentence accent location and the domain of focus (c) number of syllables (d) sentence position for the word (final and non-final) and (e) syntactic structure of part of the sentence containing a compound word or two words. He concluded that the precise timing of the F_0 fall associated with the two accents determined how they are identified; in accent I, the fall occurs earlier than in accent II.

Beckman's (1986) study compared accent patterns in English and Japanese focusing on the acoustic correlates of accent in the two languages. For the production study, the Japanese words were six minimal pairs. These were placed in 3 random orders and presented to subjects who read them in a given sentence frame. The English data had five minimal pairs (the same as was used in Fry's studies). Beckman's results indicated that in Japanese there was a difference in F_0 patterns that contrasted simple rises with simple falls on contrasting test items; the English pattern was similar. In general, words had a simple rising intonational pattern for nouns and a falling pattern for verbs. Beckman interpreted this as evidence that accentual contrasts are realized as differences in F_0 patterns.

More recently, De Jong and Zawaydeh (1999) studied word-level prosody in Jordanian Arabic. One of their aims was to examine the phonetic correlates of stress, which was felt to be a marker of prominence at the word-level. De Jong and Zawaydeh predicted that there would be three direct correlates of stress; increased duration, increased intensity and more extreme formant values. They also predicted that there would be one indirect correlate of stress, fundamental frequency patterns. More specifically, if the prosodic system of Arabic was like that of English, the F_0 associated

with stressed syllables was expected to vary depending on discourse (pg. 5). Their test material consisted of 10 types of words spoken in 5 different prosodic conditions for both statements and questions in both final and non final position, i.e. (a) isolation (b) phrase final (statement) (c) non phrase final (statement) (d) phrase final (question) (e) non phrase final (question). They recorded four female subjects. For the recording, each word was spoken in a block consisting of five repetitions of a word in each of the 5 conditions in the order a → b → d → c → e. The word blocks were randomized. Measurements included vowel durations, an estimate of the F_1 value and the F_0 at the midpoint of each vowel. With regard to F_0 , stressed syllables in the target words in statements showed an increased F_0 value.

Arvanti (1992) discussed perceptual and acoustic properties of secondary stress in Modern Greek. The research addressed the debates surrounding the presence and nature of rhythmic stress and stress induced by the stress well-formedness condition (SWFC) by which a lexical stress is allowed only on the last 3 syllable of a word. Arvanti questioned (a) whether the stress added to a host-and-clitic group because of a SWFC violation is the most prominent stress in the group as has been claimed in the literature, (b) whether this added stress is perceptually distinct from lexical stress and if so, (c) whether secondary stress and rhythmic stress were perceptually and acoustically identical and finally whether there was any evidence for rhythmic stress. Two experiments were conducted. The test material for the first experiment consisted of segmentally identical phrases with different word boundaries. One member of the test pair had a lexical stress and a SWFC-induced stress, e.g. *'ari 'sta su* 'class mark' (*su* is a clitic). The other member had two

words with lexical stress on both syllables, e.g. *'ari 'stasu* 'Ari stop'. Two distracter phrases were designed similar to the test phrases. All the phrases were incorporated into larger sentences and introduced to speakers in a randomized list who produced 6 repetitions of each. For the perception task, the distracter phrases and test phrases were extracted from the sentences and repeated twice. The stimuli were presented to 18 subjects who were asked to give both possible interpretations of the test phrases. Identification rate for the test phrases was 49.66% and for the distracters 99.1%, showing that contrary to previous findings, the SWFC-induced stress was the most prominent in the host-and-clitic group and that the original stress of the host weakened.

The second experiment directly addressed Arvaniti's third query about the perceptual and acoustic similarity of secondary stress in the host of host-and-clitic group. Four pairs of segmentally identical words with different spelling and different stress patterns were chosen. One member of the pair had antepenultimate stress, the other had stress on the last syllable. These were incorporated into segmentally identical sentences (orthographically different). The word pairs in this set differed in the position of the primary stress e.g. *a'poxi* 'hunting net' vs. *apo'xi* 'abstention'; there were four pairs of distracters. As in the first experiment, six repetitions of each sentence were recorded from a randomized list. The stimuli were prepared as before and the same 18 subjects made judgements; the test procedure was the same. The results indicated a 97.2% identification rate for test words and 98.2% identification rate for distracters, showing that rhythmic stress and secondary stress are distinguished and there are thus not the same.

For the acoustic analysis, duration, amplitude (peak, root mean square, amplitude integral) and F_0 measurements were taken for vowel in a putative secondary stressed syllable and compared with the same vowel in a putative rhythmic stressed syllable (pg. 408). The results showed that the F_0 contours showed significant differences between SS and RS words; the SS words had high F_0 on the antepenultimate syllables while RS words had very low F_0 .

In general cues to stress/accent contrasts include alignment of the F_0 contour with the words; changes in the F_0 pattern associated with the word; changes in vowel quality and vowel duration and changes in intensity, though different languages may rely to different degrees on these acoustic cues to syllable prominence.

4.6.1.1. Discussion

The methodologies employed in the studies discussed in this section suggest ways in which one might find out what the acoustic cues to the stress contrast in intensive and distributive reduplication are. In order to find out what the acoustic cues to stress or accent contrasts are in the putatively contrastive words a combination of tasks was used. First, comparable sentence frames were used for each target word such that they could be commuted in the same syntactic position without altering the grammaticality of the sentences. Second, target words are examined in several different prosodic contexts and in several different intonations to see how and if the phonetic properties differ in the different contexts. The phonetic analyses presented in this dissertation closely mimic the strategies outlined here. Recall from earlier discussions that Lawton (1963) also

examined several monomorphemic words in different prosodic contexts, i.e. phrase initial, phrase medial, phrase final and citation. According to Lawton, the pitch pattern of the target words did not change from that shown in citation form. Lawton's analysis has an unfortunate gap in that no description is given for some of the target words in citation form as a means of verifying the proposed pitch pattern in context. In addition, the data was only examined in declarative intonation. Crucially different from Lawton's analysis, this analysis is accompanied by F_0 traces of a sample of words in all the appropriate contexts and examines the words in varying intonational contours.

In the phonetic study of reduplicated words I discuss in Chapter 6, I focus primarily on the alignment of the F_0 contour with the stressed syllables in the words and on the realization of (pitch) accents on these syllables. The study of JC word-level prosody in this dissertation is thus primarily a production study since we first need to have a clear understanding of what the prosodic properties are before we can elaborate on how these properties are exploited by listeners. The data I present suggest that the percept of stress contrast may be elicited by differences in the location of the F_0 fall in words.

4.6.2. Method for Data Collection

4.6.2.1. Speakers

The production data reported on in this section are from six (6) native speakers from the Top Alston community in addition to the author (SG). There are three females and four males ranging in age from 29 to 87 at the time of the recording. These participants were

compensated for their time. Data for reduplicated words and non-reduplicated words are reported on for all of these speakers (RP, EW, WW, HF, HH, SP(m), SG). All the speakers for whom reduplicated data are described have a clear perception of the contrast between intensive and distributive reduplications. This is based on the results of a small listening task in which the speakers were presented with pictures depicting an intensive meaning or a distributive meaning. They listened to two repetitions of a reduplicated word ($9 \times 2 = 18$) and were asked to choose the picture which best fit the meaning expressed by the word they heard. Following this, the participants were asked to explain the choice they made. With regard to SG, a listening task was administered with the help of a phonetically trained graduate student at OSU. SG listened to two randomized lists of 28 reduplicated words ($28 \times 2 = 56$) and identified the type of reduplication as the word was heard. The words were sorted in two groups, citation forms and statements in one group and questions in the other group.

4.6.2.2. The Data

The analysis is based on several recordings of monomorphemic words with different stress patterns, bisyllabic and quadrasyllabic nominal compounds and reduplicated words with intensive and distributive meanings as shown in Table 4.4. The bisyllabic and trisyllabic words varied according to the position of the stressed syllable in the word. Stressed syllables are marked with (')

bisyllabic	'mada	'mother'
	ma'da	'female religious leader'
trisyllabic	ma'mel	'enamel'
	ma'riina	'undershirt'
quadrasyllabic	al'botŋ	'worthless person'
	,al'geta	'alligator'
	,gjal'menta	'type of wood'
compounds	,beli'uman	'pregnant woman'
reduplicated	yeloyelo	'very yellow; scattered yellow'
	griingriin	'very green; scattered green'
	gomigomɪ	'very sticky; sticky all over'
	blakblak	'very black; black all over'
	'laŋ'laŋ	'very long'
	'luo'luo	'very low'
	'nier'nier	'very near'

Table 4.4: *Elicited Words used in Analysis*

All the target words were produced in carrier sentences such that they were direct objects of main verbs or copula constructions. The words were produced in the five different prosodic conditions listed in Table 4.5.

Prosodic Condition		Pragmatic Context
(a) Isolation (b) Final (nuclear)	(c) Non-final (prenuclear)	Statement
(d) question - final	(e) Non-final (prenuclear)	Yes-No Question

Table 4.5: *Prosodic Conditions for Target Words*

These conditions placed the target words in final and non final position in the context of a broad focus statement, a pragmatically neutral yes-no question, and in citation form. The

final position in the sentence corresponds to having the word in nuclear position, for example, *im want wan we blakblak* 'he wants one that is very black', and the non-final position to having the word in prenuclear position, for example, *im want di blakblak wan an moni* 'he wants the very black one and (some) money'. The nuclear position (location of the nuclear accent) is generally defined as the location for the last accent in an intermediate phrase and prenuclear position as the location for all the accents appearing before the nuclear accent. As discussed above, the literature on the acoustic properties of stress contrasts in a variety of languages shows that these properties are not uniform across all prosodic contexts in that some contexts better preserve the contrasts than others. Based on this, it is reasonable to expect the production of JC speakers to be similarly heterogeneous across the contexts in which the test items were elicited.

4.6.2.3. Elicitation Technique

All interactions between the participants and the researcher were done mostly in JC. All the utterances for all the subjects except SG were elicited using a set of pictures and contextual information to cue the desired intonation and remind the speaker of the carrier sentence. The researcher first discussed the different types of sentences being targeted with each participant. That is, one with the target word at the end (final) and one with other words after the target word (non-final), for both a statement and a question. Each participant was then presented with a picture depicting the target word and was asked questions to elicit the target word. Following that, questions were asked to elicit the different utterance types. In cases where the target word was not known, no further

attempts were made to elicit productions for that word. The example in (62) illustrates part of a typical elicitation session.

- (62) Researcher shows picture of a pregnant woman
[In JC]: Yu nuo wan ada niem fi dis person (pointing to picture)
Do you know another name for this person?

Informant: beliuman 'pregnant woman' lit .belly woman (citation)

Researcher gives context:

Wan komyuniti dakta want fi chekup pan dem kaina pipla ya an yu nuo, so gi smady di infamieshan dat im want som a dem pipl ya.
A community doctor wants to check up on these kinds of people and you know this, give someone this information that he wants some of these people (shown in the picture).

Informant: Im wan som beliuman (statement final)
He wants some pregnant women.

Researcher: Dis dakta greedy tu and im want som yam so tel smady se im want som a dem pipl ya and som yam.
This doctor is also greedy and he wants some yams, so tell someone that he wants some of these people (shown in the picture) and some yams.

Informant: Im wan som beliuman an som yam (statement non-final)
He wants some pregnant women and some yams.

Researcher: Yu si di dakta an yu nuo we dem kaina pipla ya liv so ask im if im want som a dem.
You see the doctor and you know where these kinds of people (shown in the picture) live so ask him if he wants some of them

Informant: Yu want som beliuman? (question final)
Do you want some pregnant women?

Researcher: Sins as yu plant yam tu yu kyan giv di dakta som so ask im if im want som a dem pipl ya and som yam.
Since you plant yams as well you can give the doctor some, so ask

him if he wants some of these people (shown in the picture) and some yams.

Informant: Yu want som beliuman an som yam? (question non-final)
Do you want some pregnant women and some yams?

The interaction with each informant lasted for an average of 45 minutes. The elicitation sessions for the reduplicated words was done 1 month prior to that for the unreduplicated words and compounds.

The recordings for SG were done in a sound attenuated booth in the phonetics lab in the Department of Linguistics, OSU, to a Sony DTC-790 digital audio tape deck recorder. All the other recordings were done in a quiet room in a home in Top Alston, to a Sony PCM-M1 digital audio portable recorder. All the subjects wore a Shure SM-10a head-worn microphone and were instructed to speak at a normal rate and as naturally as possible. Both sets of data were digitized at a sampling rate of 22050 Hz, 16 bit using Creative Wave Studio (v. 4.50.08). F_0 calculation was done using the F_0 tracking utility¹⁸ in PRAAT 4.0.26. For the purposes of getting an uninterrupted pitch track, to the extent possible, the words and sentences were made up of sonorants.

¹⁸ The online PRAAT manual indicates that this is an autocorrelation method as described in Paul Boersma. (1993). Accurate short-term analysis of the fundamental frequency and the harmonics-to-noise ratio of a sampled sound. In *Proceedings of the Institute of Phonetic Science of the University of Amsterdam*. Vol. 17: 97-110.

4.7. F₀ Pattern in other Monomorphemic Words and Compounds

4.7.1. F₀ Pattern in Trisyllabic Words

In this section I examine the F₀ contours of trisyllabic words. I look at two representative words with primary stress in different locations, i.e. penultimate *miriina* ‘men’s undershirt’, and final *ma'mel* ‘enamel’.

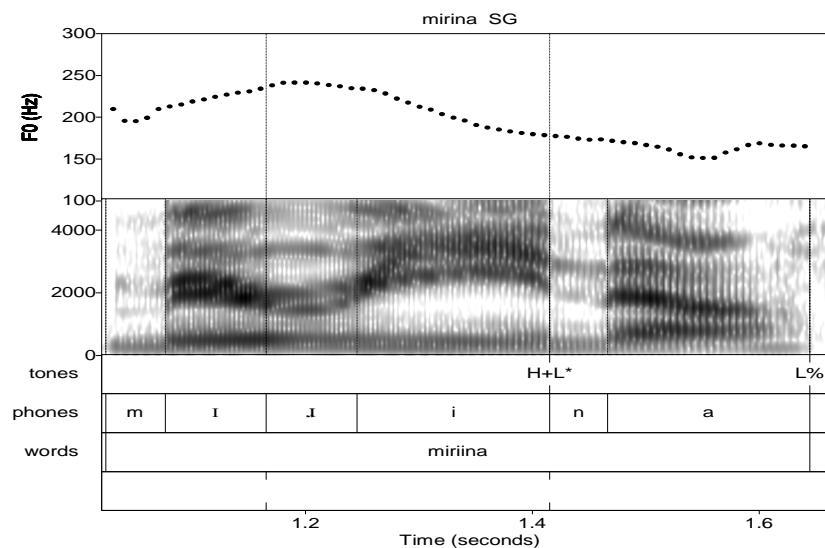


Figure 4.13: Fundamental frequency contour (upper panel) and spectrogram (lower panel) of *miriina* ‘men’s undershirt’ produced in citation form. This word has primary stress on the penultimate syllable.

As shown in Figure 4.13, there is a HL F₀ pattern associated with the penultimate stressed syllable of the word *miriina* ‘men’s undershirt’ and both the low portion and the high portion of the F₀ are located within the stressed syllable. I transcribe this a H+L* pitch accent reflecting the fact that there is a low tonal target on the stress syllable and a preceding high.

In Figure 4.14, the word occurs in final and non-final position in statement intonation and the H+L* pitch accent is maintained.

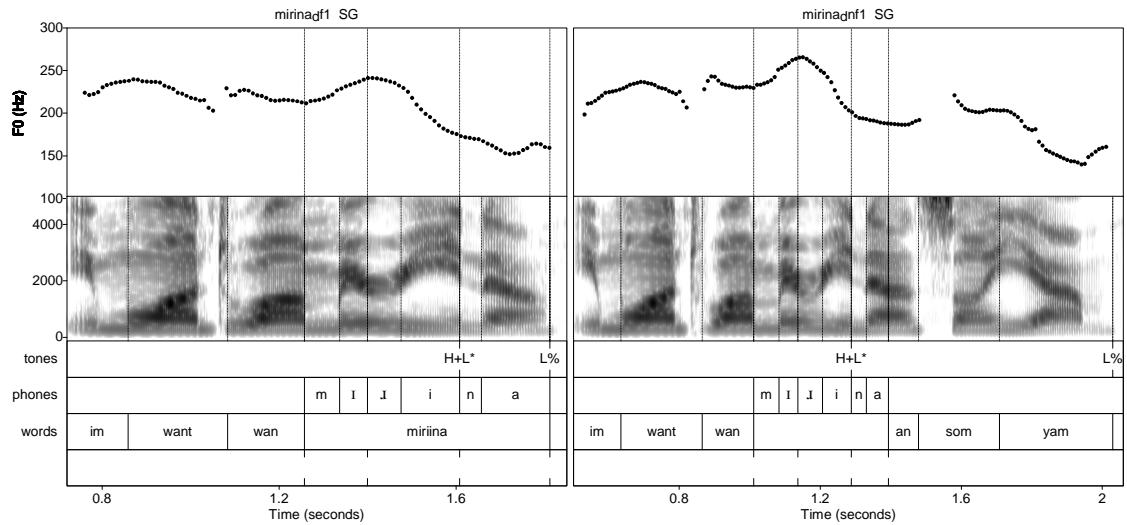


Figure 4.14: Fundamental frequency contours (upper panels) and spectrograms (lower panels) of *miriina* ‘men’s undershirt’ produced in statement intonation final position, *im want wan miriina* ‘He wants a men’s undershirt’ (left graph) and non-final position, *im want wan miriina an som yam* ‘He wants a men’s undershirt and some yams’ (right graph).

Figure 4.15 shows the word in final and non-final position in question intonation. In these examples, the H+L* is also maintained in both contexts.

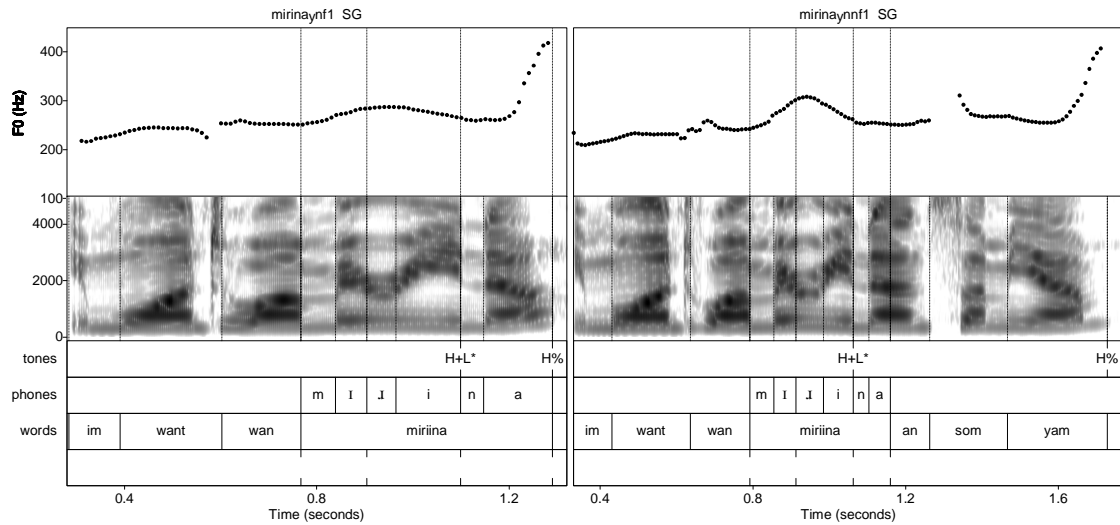


Figure 4.15: Fundamental frequency contours (upper panels) and spectrograms (lower panels) of *miriina* ‘men’s undershirt’ produced in question intonation final position, *im want wan miriina* ‘Does he want a men’s undershirt?’ (left graph) and non-final position, *im want wan miriina an som yam* ‘Does he want a men’s undershirt and some yams?’ (right graph).

The examples in Figure 4.16 through Figure 4.18 show *ma'mel* ‘enamel’ which has primary stress on the final syllable. As illustrated by the citation form shown in Figure 4.16, we see the now familiar fall in pitch onto the stressed syllable. As before, I analyse this as a H+L* pitch accent on the stressed final syllable.

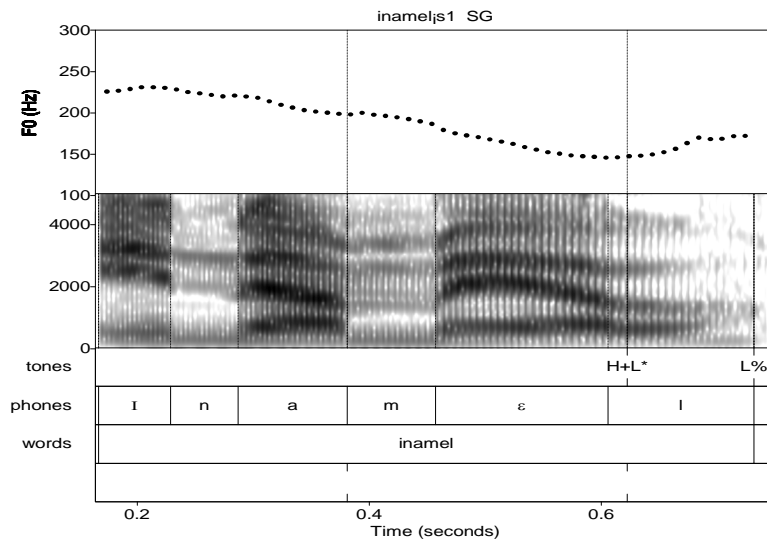


Figure 4.16: Fundamental frequency contour (upper panel) and spectrogram (lower panel) of the word *inamel* ‘enamel’ produced in citation. This word has primary stress on the final syllable.

When the word occurs in statement intonation as in Figure 4.17, we see the same H+L* accent associated with the stressed final syllable. Notice however, that in these examples, the high portion of the accent is in the preceding syllable. Perhaps it is this kind of observation which led some researchers like Cassidy and LePage (1967) to conclude that high pitch always precedes the stressed syllable in JC.

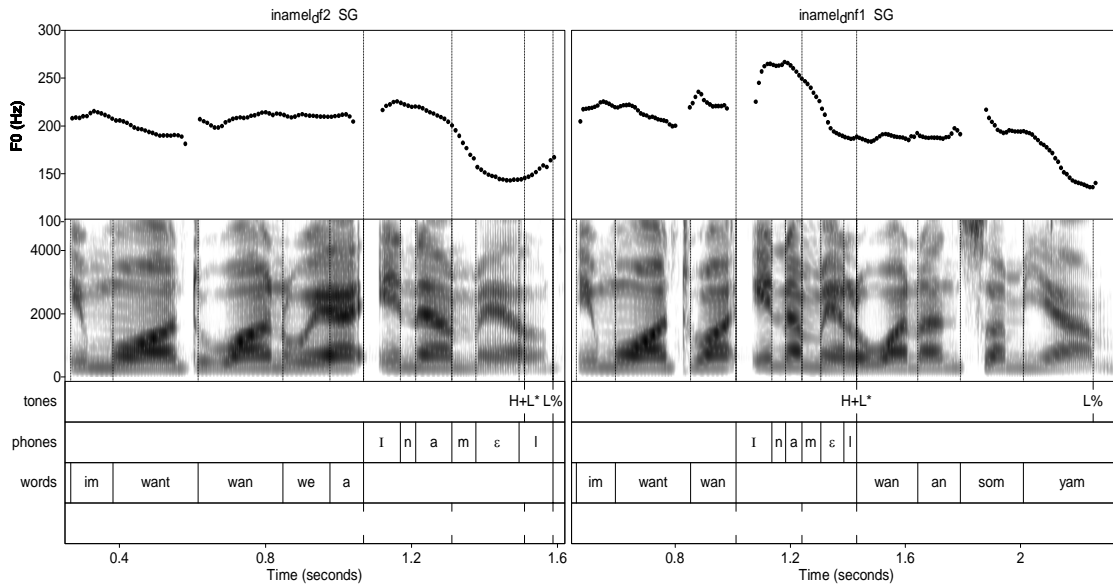


Figure 4.17: Fundamental frequency contours (upper panels) and spectrograms (lower panels) of the word *inamel* ‘enamel’ produced in statement intonation final position, *im wan we a inamel* ‘He wants one that is (made of) enamel’ (left graph) and non-final position, *im wan we a inamel an som yam* ‘He wants one that is (made of) enamel and some yams.’ (right graph).

Figure 4.18 shows the word in question intonation and again we see a H+L* accent with the low portion within the stressed syllable and the high portion preceding it. The pitch then rises to the high final contour of the question intonation. That is the F₀ contour associated with these words shows a fall-rise melody in question intonation.

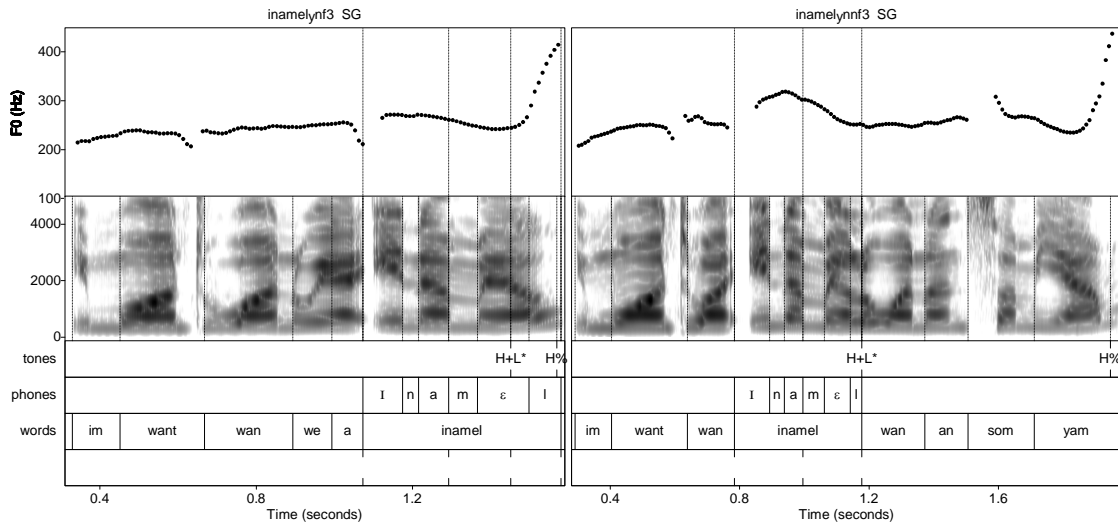


Figure 4.18: Fundamental frequency contours (upper panels) and spectrograms (lower panels) of the word *inamel* ‘enamel’ produced in question intonation final position, *im wan we a inamel* ‘Does he wants one that is (made of) enamel?’ (left graph) and non-final position, *im wan we a inamel an som yam* ‘Does he wants one that is (made of) enamel and some yams?’ (right graph).

4.7.1.1. Interim Summary

To summarize, in trisyllabic words there is a low tonal target on the stressed syllable of words which is preceded by a high. This high can either be within the same syllable or on the preceding syllable. In both cases, this is transcribed as a H+L* pitch accent. Further, this pattern is maintained in both prosodic contexts considered: final and non-final in both statement and question intonation. The main differences observed have to do with how the H+L* accent is aligned with the words and also the type of intonation with which they are produced.

4.7.2. F₀ Pattern in Quadrasyllabic words

In this section, I examine the F₀ contour of quadrasyllabic words. Recall that the predominant stress pattern on these words is primary stress on the penultimate syllable. The graphs shown are for a word with all light syllables, *aligetá* ‘alligator’ and for a word with a heavy penultimate syllable, *gjalmentá* ‘type of wood’. Figure 4.19 through Figure 4.21 show utterances produced by SG and Figure 4.22 through Figure 4.24 show utterances produced by HH, a 64 year old female.

As shown in the citation form of *gjalmentá* ‘type of wood’ in Figure 4.19 there is a fall in pitch onto the stressed penultimate syllable of the word. As before, I analyse this as a H+L* accent. Notice also that the high portion of the F₀ is in the preceding syllable.

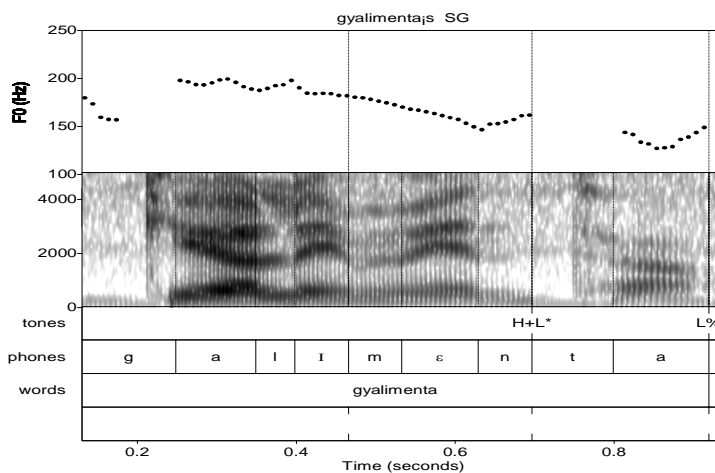


Figure 4.19: Fundamental frequency contour (upper panel) and spectrogram (lower panel) of *gjalmentá* ‘type of wood’ produced in citation. This word has primary stress on the penultimate syllable.

When the word appears in final and non-final position in statement intonation, as shown in Figure 4.20, we also observe a fall in pitch onto the stressed penultimate syllable. As in the citation form, the high portion of the F_0 is located in the preceding syllable. In both of the examples shown in the pattern is transcribed as a H+L* pitch accent.

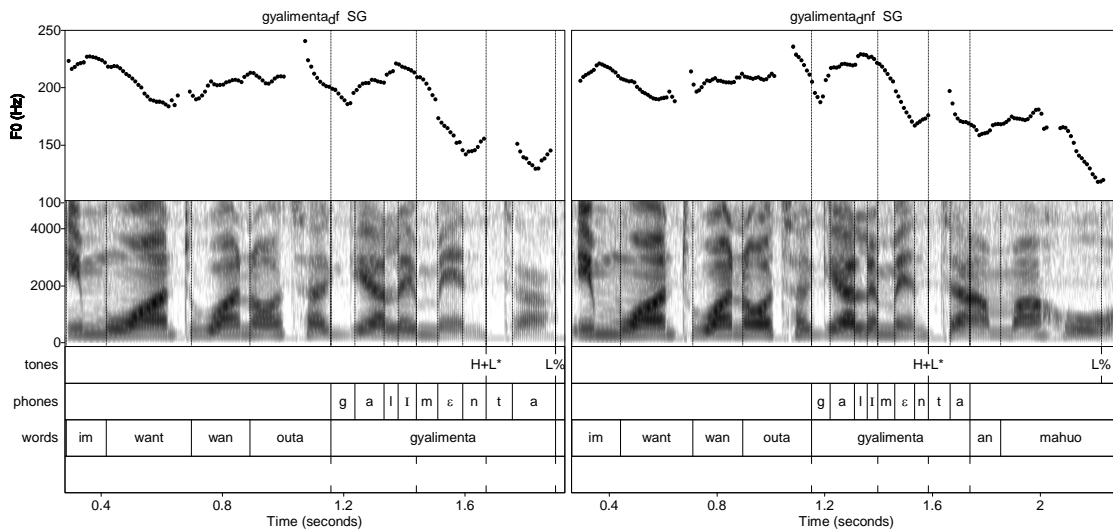


Figure 4.20: Fundamental frequency contours (upper panels) and spectrograms (lower panels) of *gyalimɛnta* ‘type of wood’ produced in statement intonation in final position, *im want wan outa gyalimɛnta* ‘He wants one of galimeta wood’ (left graph) and in non-final position, *im want wan outa gyalimɛnta an mahuo* ‘He wants one of galimeta wood and mahoe’ (right graph).

A similar pattern is seen when the word occurs in question intonation, as shown in Figure 4.21. Notice that when the word occurs in non-final position, where another accented word ‘mahoe’ follows, the H+L* pitch accent is still realized on the stressed syllable.

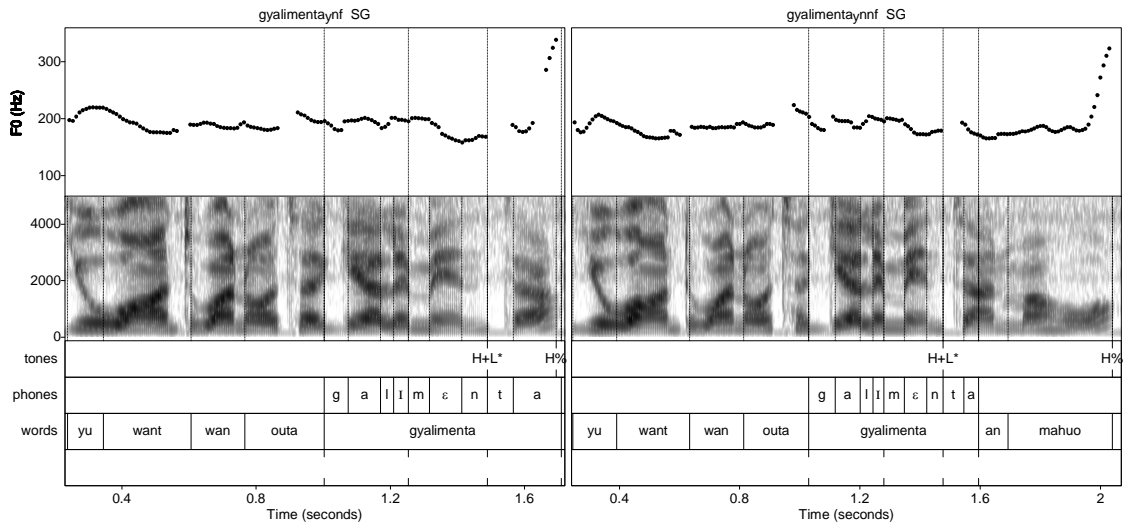


Figure 4.21: Fundamental frequency contours (upper panels) and spectrograms (lower panels) of *galimeta* ‘type of wood’ produced in question intonation in final position, *im want wan outa gyalimeta* ‘Does he want one of galimeta wood?’ (left graph) and in non-final position, *im want wan outa gyalimeta an mahuo* ‘Does he want one of galimeta wood and mahoe?’ (right graph).

The patterns seen in the data described above are comparable to those produced by other speakers. The graphs below, (Figure 4.22 and 4.23), show representative F_0 contours of *aligeta* ‘alligator’ produced by HH. In these examples, there is a consistent fall in pitch on the stressed penultimate syllable of the word as we saw in the previous examples. This high-low melody is analysed as a H+L* pitch accent.

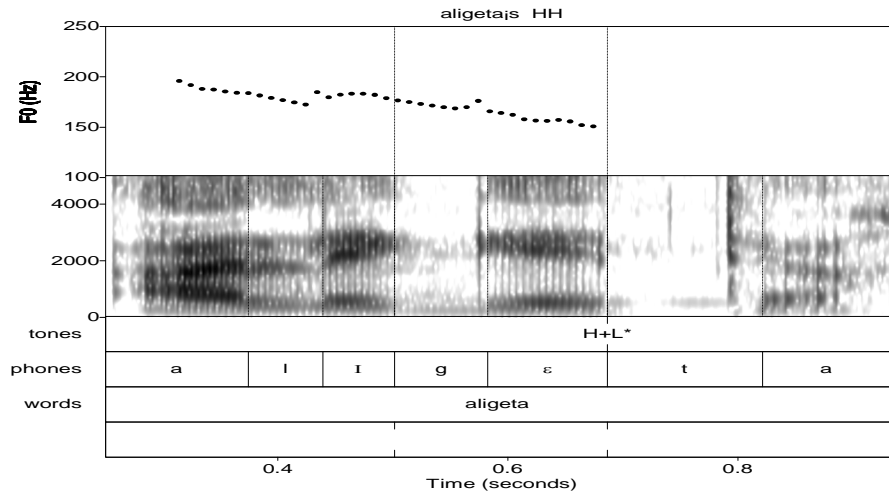


Figure 4.22: Fundamental frequency contour (upper panel) and spectrogram (lower panel) of *aligetajɛ* ‘alligator’ produced in citation. This word has primary stress on the penultimate syllable.

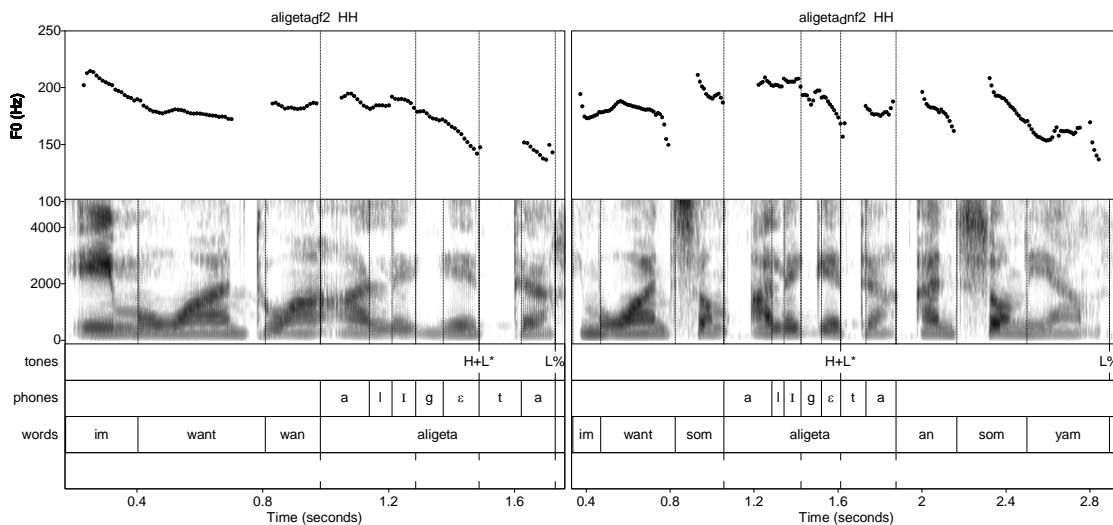


Figure 4.23: Fundamental frequency contours (upper panels) and spectrograms (lower panels) of *aligetajɛ* ‘alligator’ produced in statement intonation in final position, *im want wan aligeta* ‘He wants an alligator’ (left graph) and in non-final position, *im want wan aligeta an som yam* ‘He wants an alligator and some yams’ (right graph).

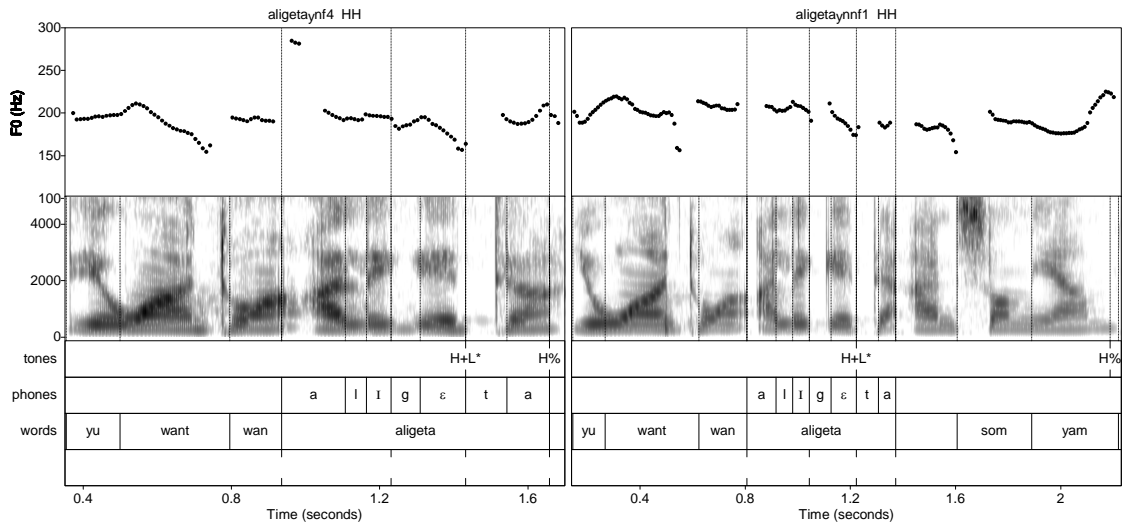


Figure 4.24: Fundamental frequency contours (upper panels) and spectrograms (lower panels) of *aligeta* ‘alligator’ produced in question intonation in final position, *im want wan aligeta* ‘Does he want an alligator?’ (left graph) and in non-final position, *im want wan aligeta an som yam* ‘Does he want an alligator and some yams?’ (right graph).

4.7.2.1. Interim Summary

As we can see from these representative quadrasyllabic words, there is a consistent fall in pitch onto the penultimate stressed syllable which is maintained in all contexts. I analysed this as a H+L* pitch accent to reflect the observation that there is a low tonal target on the stressed penultimate syllable. As with trisyllabic words, being in final or non-final position does not affect the type of pitch accent associated with the stressed syllable in quadrasyllabic words.

4.7.3. F₀ Pattern in Compound Words

In this section I examine the F₀ pattern of quadrasyllabic compound words. I focus on these types since they provide a source of comparison with monomorphemic words and reduplicated words with similar syllable structures. I include the comparison with monomorphemic words in this section and leave the comparison with reduplicated words for Chapter 6 where I discuss the F₀ pattern of reduplicated words.

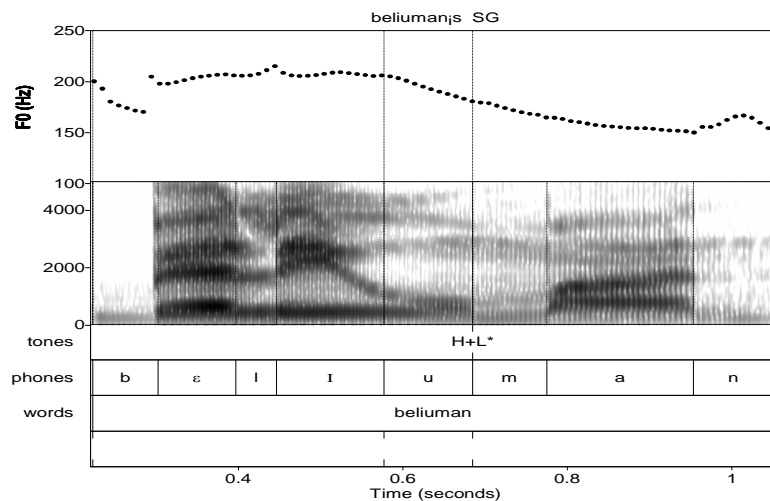


Figure 4.25: Fundamental frequency contour (upper panel) and spectrogram (lower panel) of *beluman* ‘pregnant woman’ produced in citation.

As shown in Figure 4.25 there is a fall in pitch onto the penultimate syllable of the word, *beluman* ‘pregnant woman’, which is indicative of a H+L* pitch accent, as seen for the quadrasyllabic words in section 4.7.2.

Figure 4.26 and Figure 4.27 show the word in statement intonation and question intonation respectively. As we have seen for quadrasyllabic words, in this case the H+L*

pitch accent seen in citation form is maintained in both intonations in final and non-final position in the utterances.

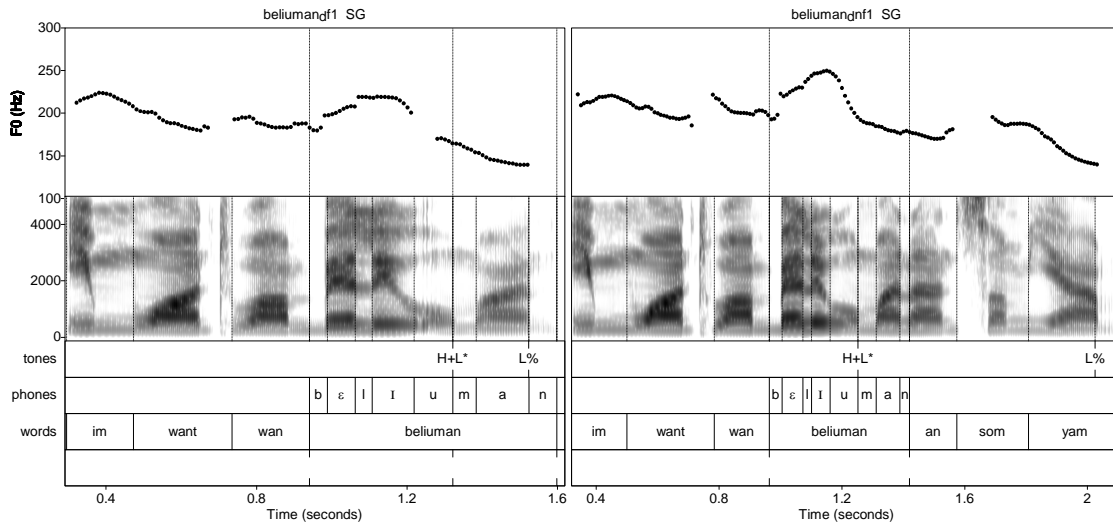


Figure 4.26: Fundamental frequency contours (upper panels) and spectrograms (lower panels) of *beluman* ‘pregnant woman’ produced in statement intonation final position, *im want wan beluman* ‘He wants a pregnant woman’ and in non-final position, *im want wan beluman an som yam* ‘He wants a pregnant woman and some yams.’

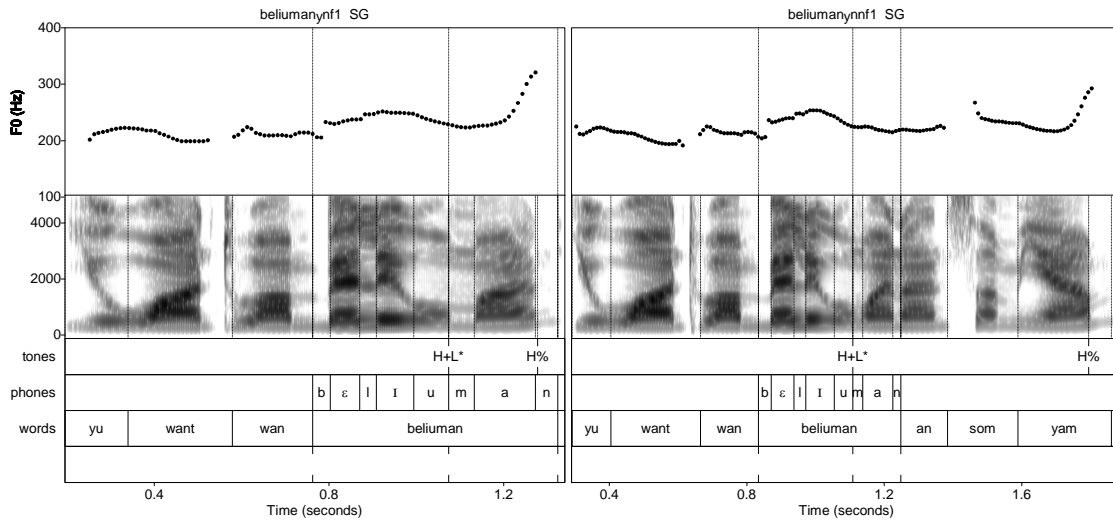


Figure 4.27: Fundamental frequency contours (upper panels) and spectrograms (lower panels) of *beluman* ‘pregnant woman’ produced in question intonation final position, *im want wan beluman* ‘Does he want a pregnant woman?’ and in non-final position, *im want wan beluman an som yam* ‘Does he want a pregnant woman and some yams?’

The patterns seen here are comparable to those produced by other speakers. The graphs below show representative F_0 contours of *beluman* ‘pregnant woman’ produced by SP (Figure 4.28).

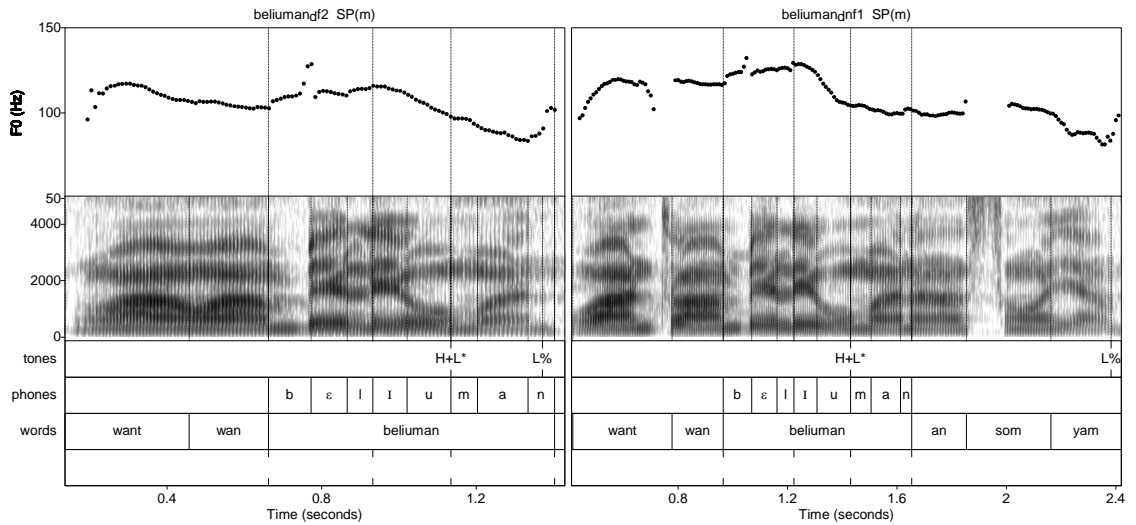


Figure 4.28: Fundamental frequency contours (upper panels) and spectrograms (lower panels) of *beli'uman* ‘pregnant woman’ produced in statement intonation final position, (*im*) *want wan beli'uman* ‘He wants a pregnant woman’ and in non-final position, (*im*) *want wan beli'uman an som yam* ‘He wants a pregnant woman and some yams.’

As in the SG productions, there is a fall in pitch onto the stressed penultimate syllable of the compound, which is transcribed as a H+L* pitch accent. The same pitch accent is seen in the examples below in Figure 4.29 when the word is produced in question intonation.

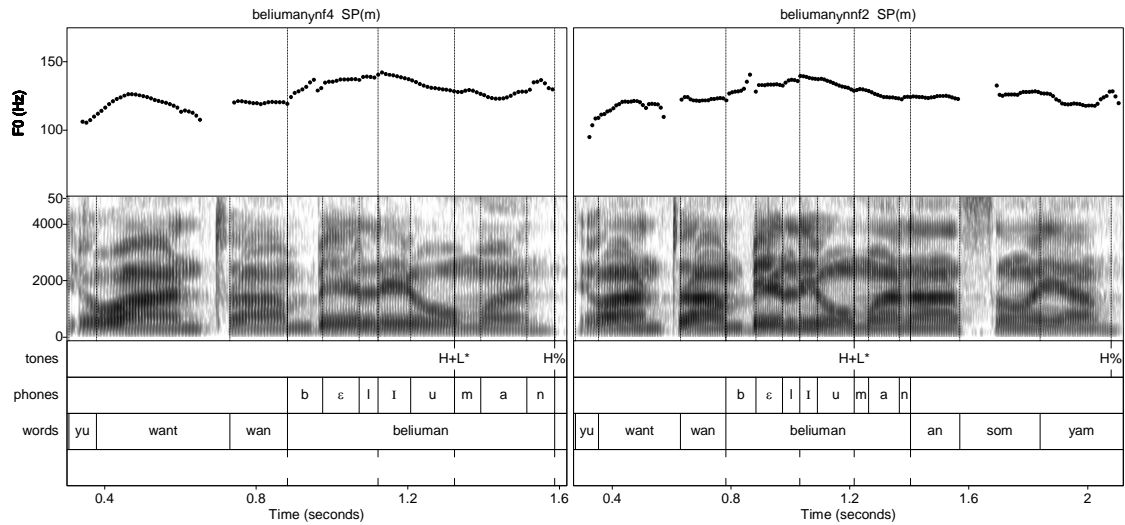


Figure 4.29: Fundamental frequency contours (upper panels) and spectrograms (lower panels) of *bel'uman* ‘pregnant woman’ produced in question intonation final position *yu want wan beliuman* ‘Do you want a pregnant woman?’ and in non-final position *yu want wan beliuman an som yam* ‘Do you want a pregnant woman and some yams?’

4.7.3.1. Interim Summary

In summary, in quadrasyllabic compounds there is a consistent fall in pitch onto the stressed penultimate syllable which is maintained in all contexts. As before, we can analyse this as a H+L* pitch accent to reflect the observation that there is a low tonal target on the stressed penultimate syllable. As seen for trisyllabic and quadrasyllabic words, being in final or non-final position does not affect the type of pitch accent associated with the stressed syllable.

4.7.4. Section Summary

The main points from this section are summarized as follows. First, there is a pitch fall onto the stressed syllable which appears on the words in both nuclear and prenuclear positions in sentences and in citation form. This high-low melody can be analysed as a H+L* pitch accent in which the low is associated with the primarily stressed syllable of the word. The high portion of the F₀ may be in the same syllable as the low or in the preceding syllable. Second, we also saw that a H* pitch accent may also be associated with the stressed syllable in bisyllabic words occurring in question intonation. Another relevant observation is that only the most prominent syllable in the word is assigned a pitch accent so, syllables with secondary stresses and unstressed syllables are considered unaccented. For example, while *,na'mɛl* 'enamel' has primary stress on the final syllable and secondary stress on the initial syllable a pitch accent is only associated with the final syllable. This falls out naturally from the prosodic structure of the word as depicted by the metrical grid representation in (63).

(63)

		x	Prwd	accented
	x	x	Foot	stressed
	x	x	x	
	ɪ	na	mɛl	

Metrical grid representation of *,na'mɛl* 'enamel'.

Only the final syllable in *enamel* gets accented because it is in a metrically stronger position than other syllables.

Third, the difference between lexically contrastive words can be accounted for in terms of differences in the alignment of the pitch accent with the word. All of these observations support the proposal of JC word-level prosody as a stress-based system rather than a tone-based system.

Table 4.6 summarizes the type of pitch accents on trisyllabic words, quadrasyllabic words and compounds.

Prosodic Condition	
Citation	H+L* (L%)
Statement final	H+L* (L%)
Statement non-final	H+L* (L%)
Yes-No question final	H+L* (H%)
Yes-No question non-final	H+L* (H%)

Table 4.6: *Summary of Pitch Accents in Trisyllabic, Quadrasyllabic and Compound Words*

4.8. Chapter Summary

As discussed above, several researchers have made statements regarding the F_0 pattern associated with stressed syllables in JC. All of these views are in essence rather similar. Lawton (1963), for example, stated that stressed syllables have a high-falling tone while Wells (1973) claimed that stressed syllables in JC have a high-falling pitch. Cassidy and LePage (1967) reported that high pitch preceded the stressed syllable and Devonish (e.c.; 1998; 2003) suggests that stressed syllables have a high-low melody. Based on the data presented in this chapter, it is clear that these observations are essentially correct. That is,

when we examine the test words in statement intonation and in citation form, we saw that the stressed syllable in JC has HL F_0 pattern, the low portion of which is associated with the stressed syllable. Notice, however, that a high pitch does not always ‘precede’ the stressed syllable as Cassidy and LePage suggest. For example, in bisyllabic words with a strong-weak pattern, the high pitch peak was contained in the same syllable as the fall, whereas in words with a weak-strong pattern, the high preceded the stressed syllable. The crucial observation is that the shape of the F_0 is not contrastive. Rather, lexical contrasts are signaled by differences in the alignment of the *same* pitch accent shape with the word rather than by different tone patterns. I propose therefore that native speakers determine which syllable is stressed based on where in a word the fall in pitch occurs. The only exception to this generalization was with bisyllabic words in question intonation where we saw that in some cases there was no fall in pitch onto the stressed syllable. In these cases, I would suggest that the listener would have to rely on some other acoustic cue for the percept of stress such as vowel duration or differences in vowel quality.

The observation that lexical contrasts in JC are signaled differences in F_0 alignment allowed for a characterization of the JC prosodic system as a stress system. This places JC with language with typologically similar systems such as Russian, German and English. The phonological grammar of stress languages like JC indicates that the tones of a pitch accent are aligned with stressed syllables. The specific question which will be addressed in chapter 6 is whether the segmentally identical reduplicated words are also differentiated by timing differences of a pitch fall onto stressed syllables or timing differences in the alignment of the F_0 peak with the word.

CHAPTER 5

WORD LEVEL STRESS IN JAMAICAN CREOLE

5.1 Introduction

The data presented in the previous chapter supports a classification of the JC word-level prosodic system as a *stress-based* system. This is a significant claim, especially since researchers have characterized JC prosody differently or have otherwise failed to characterize it at all. Recall for example, that researchers like Lawton (1963, 1968) and Akers (1981) claimed that stress is not distinctive in JC. The data discussed here illustrates the word level stress patterns in the language and further demonstrates that stress distinguishes between words.

In this section, I give some background information on the data taken from Cassidy and LePage (1967). In the following sections, I discuss the stress patterns on monomorphemic words and compound words. I also present data for words which have stress patterns that fall outside of the more generally observed pattern. The discussion is based on a sample of 200 monomorphemic content words and 84 compound words taken primarily from the Dictionary of Jamaican English (DJE) (Cassidy and LePage, 1967), along with some elicitations from native speakers. I used the DJE as the primary source

for primary stress assignment in the words, supplemented by native speaker intuitions on syllable prominence. Cassidy and LePage mark syllables with a high rising pitch with an acute accent. Although they do not explicitly say that this notation should be interpreted as primary stress in JC, when crosschecked with native speaker intuitions, in the majority of cases, the syllable marked with the acute accent coincided with native speaker judgments regarding which syllable was prominent. In cases where they did not match, I relied on the native speaker's judgment.

The discussion of stress presented here shares similarities with Alderete's (1993) previous analysis of JC stress but differs in some important respects which I discuss in detail just below and in section 5.4.

5.2 Stress Patterns

Stress assignment in JC makes reference to several phonological parameters such as syllable weight and syllable position. In the data shown, the syllables bearing stress are marked with (') for primary stress and (,) for secondary stress and syllable boundaries are indicated by a period. I assume the maximal onset approach to syllabification and use the notations L and H to refer to light and heavy syllables respectively.

5.2.1 Bisyllabic Words

As seen in the examples below, bisyllabic words typically have initial stress when both syllables are light as in (64a). However, if the word has a heavy syllable, as in (64b) and (64c), then the heavy syllable is stressed (see also Wells (1973) and Alderete (1993)).

Further, the stress pattern on HH words in (64d) shows that when there are two heavy syllables the initial syllable gets stress. There is no secondary stress on bisyllabic words.

(64)(a)	'LL	'ka.sha	'kind of tree (with thorns)'
		'ma.ka	'prickle'
		'kre.be	'legacy, worn out or useless item'
		'ha.fu	'type of yam'
		'nu.ku	'amputated'
(b)	'LH	a.'kam	'keloid on ear due to piercing; wild yam'
		a.'rɪndʒ	'orange'
		go.'yaak	'a type of banana'
		gɪ.'laant	'to go about idly or frivolously'
		a.'noŋs	'to announce'
		pa.'laav	'to lay idle and prostrate'
		br.'fuɔ	'before'
		su.'puɔz	'suppose'
		dr.'said	'decide'
		a.'gen	'also, in addition, anymore, any longer'
(c)	'HL	'uɔ.pɪŋ	'to open'
		'fai.fa	'trumpeter fish'
		'pai.zɪ	'to poison'
		'maa.mɪ	'type of fruit'
		'aa.da	'to order'
		'baa.br	'a type of yam'
		'gyan.da	'gander'
		'gan.dʒa	'hemp, marijuana'
'gyan.zɪ	't-shirt'		
(d)	'HH	'dʒii.zas	'Jesus'
		'gaa.lɪn	'egret'
		'iiv.nɪn ~ 'iiv.lɪn	'evening'
		'duo.duo	'dough, unbaked bread/cake'
		'nuo.tɪs	'to notice, stare at'
		'braad.kyaas	'to broadcast'

The general pattern seen has primary stress on the leftmost heavy syllable. For words with an initial heavy syllable, stress is thus on the first syllable, e.g. *'gaalin* 'egret', and for words with a final heavy syllable, stress is on the final syllable, e.g. *br'fuɔ*

‘before’. In cases where there are no heavy syllables, stress falls on the penultimate syllable as in *hafu* ‘type of yam’.

In addition to this pattern, some bisyllabic words exhibit an alternate stress pattern. The data in (65) and (66) show bisyllabic words that have a contrast between a weak-strong (WS) and a strong-weak (SW) stress pattern. The words in (65), have semantic differences between words in the same word class whereas the words in (66) have differences between words of different lexical categories.

(65) Contrastive Pattern - Same Word Class

(a) HL	kon'tri	‘nickname’	(b)	'kontri	‘place’
	faa'da	‘religious leader, male’		'faada	‘parent, male’
	sis'ta	‘religious affiliate, fem.;		'sista	‘sibling, fem. nurse’
		specially ranked nurse’			
LL	ma'da	‘religious leader, fem.’		'mada	‘parent, fem.’
	brɛ'da	‘religious affiliate, male’		'breda	‘sibling, male’

The words in (65a) have primary stress on the final light syllable contrary to the expected pattern. The data presented earlier showed that in the regular pattern bisyllabic LL and HL words have primary stress on the initial syllable, which is what we see in the words in (65b). This unexpected weak-strong stress pattern is also seen in the adjectives in (66a) which contrast with the nouns in (66b) which have the predicted strong-weak pattern.

(66) Contrastive Pattern - Different Classes

Adjective		Noun	
(a) LL	br'zi	‘fruit - poison antidote’	(b)
	og'li	‘ugly’	'brzi
			'ogli
			‘busy’
			‘fruit’

We can compare these patterns to that seen in the words in (67). These words are different from those seen in (65) and (66) in that the stress pattern varies between a weak-strong (WS) and a strong-weak (SW) pattern even in the same speaker's speech without affecting the meaning. Thus only one variant conforms to the expected stress pattern.

(67) Variable Pattern

HL	'stuo.rɪ ~ stuo.'rɪ	'story'
	'pie.pa ~ pie.'pa	'paper'
	'pii.pl ~ pii'pl	'people'
	'tie.bl ~ tie.'bl	'table'
LL	'pɛ.pa ~ pɛ.'pa	'pepper'

The stress patterns in the words in (68) also differ from the regular pattern observed in (64). Based on the patterns seen in (64b), the forms in (68) would be expected to have stress on the final heavy syllable, as in *go'yaak* 'type of banana'. However, contrary to our expectations, these words have stress on the initial light syllable. 5.6% of the bisyllabic words in the dataset have this pattern.

(68)	LH	'ba.fan	'clumsy person'
		'va.mit	'to vomit'
		'u.man	'woman'
		'wi.kɪd	'wicked'

As I discuss further below, I treat words with these alternate stress patterns as lexically marked since their stress patterns differ from the regular pattern.

5.2.2 Trisyllabic Words

Trisyllabic words with heavy syllables may have primary stress on the initial syllable as in (69), the penultimate syllable as in (70), or the final syllable as in (71). In these examples, we see that once again it is the heavy syllable which receives primary stress in each case, as it is the only heavy syllable in the words. Secondary stress occurs on the initial syllable of the word as in (71) but there is no secondary stress on the words in (69) and (70). Some evidence for the absence of stress on word final light syllables can be gleaned from vowel deletion. In some words, vowels in unstressed final syllables tend to be deleted whereas those in stressed syllables tend not to be deleted, e.g. *nɪgɫɛkful* → *nɪgɫɛkfl* ‘neglectful’; *'baksaidin* → *'baksaidɪŋ* ‘severe beating’ but **'dʒɪmbɪlɪŋ* → *dʒɪmbɪlɪn* ‘type of tree’.

(69)	HLL	'niiz.bɛ.ɾɪ	‘naseberry’
		'baa.kɪ.nɪ	‘a type of ring game’
		'gyaa.sha.nɪ	‘folk tale bull’
		'nuo.ba.dɪ	‘nobody’
		'boŋ.go.bɪ	‘type of fish’
		'mas.kɪ.ta	‘mosquito’
		'gaŋ.ga.lu	‘bully, ruffian’
		'kom.bo.lo	‘companion, friend’
		'san.ta.pi	‘centipede’
		'saŋ.ku.ku	‘to stoop’
(70)	L'HL	ma.'rii.na	‘sleeveless undershirt’
		ma.'fii.na	‘wretched, paltry, unfortunate’
		ha.'naa.sɪ	‘folktale character (spider); general term for spider’
		tu.'maa.lɪ	‘crab dish’
		ba.'faa.nɪ	‘a child that doesn’t learn to walk on time’
		ka.'saa.da	‘cassava’
		ta.'kaa.ɾɪ	‘East Indian dish of vegetable and curry’
		gɪ.'zaa.da	‘open tart filled with grated sweetened coconut’
		a.'nan.sɪ	‘folktale character (spider); general term for spider’

su.'sum.ba	'type of bean'
ku.'kum.ba	'cucumber'
ba.'ram.pa	'fallow land; part of ginger plant'
pa.'laŋ.ka	'fishing device'
pi.'tʃie.ri	'type of bird'
ba.'rau.tŋ	'without'
pi.'tie.ta	'potato'
tʃi.'kie.ni	'trickery'
sa.'puo.ta	'a type of fruit'
a.'riel.ya	'type of flowering plant'
ko.'maan.da	'variety of cocoa'

(71)	LLH	,ba.na.'klaa	'sour milk'
		,ba.ra.'rap	'imitation of something falling or colliding'
		,bra.ga.'dap	'fish fritter; flour and saltfish sauce; a sudden stop'
		,pa.ra.'kiit	'parakeet'
		,ka.la.'ban	'a box-like trap made of sticks for catching birds'
		,i.na.'mɛl	'enamel'

In the following examples in (72) and (73), there is more than one heavy syllable in a word and in these cases, the leftmost heavy syllable gets primary stress. Secondary stress falls on the final heavy syllable in (73) but not on the final light syllable in (72).

(72)	'HHL	'bak.sai.dŋ	'severe flogging'
		'kyaa.pɪn.ta	'carpenter'
(73)	'HLH	'baa.bi.,kyuu	'concrete patio for drying food'
		'baŋ.ga.,raŋ	'useless odds and ends; noise'
		'dʒɪm.bi.,lɪn	'type of tree'
		'hɪg.na.,rant	'quick to anger, arrogant, ill-mannered'
		'dan.dɪ.,mait	'dynamite'
		'kul.tr.,viet	'to plant crops'
		'skia.fi.,las	'type of skin disease; eczema'
		'kruo.ko.,dail	'crocodile'
		'haas.pɪ.,tal	'hospital'
		'maa.fɑ.,laa	'public quarrel'

'waa.ri,fai 'extremely angry, warlike'

The stress pattern in the forms shown in (74) through (75) is also consistent with the observation made above. In the examples in (74), the penultimate (heavy) syllable is stressed rather than the final (heavy) syllable since it is the leftmost heavy syllable; there is no secondary stress in these words.

(74)	LHH	tʃa.'paa.lɪn	'tarpaulin'
		ku.'muu.dʒɪn	'two-faced; deceitful'
		gɪ.'laan.tɪn	'to fool around instead of doing duties'
		dʒu.'mie.kan	'Jamaican'
		ma.'ʃie.tɪd	'dilapidated, of ill appearance'
		nɪ.'glek.ful	'neglectful'

The example in (75) has all heavy syllables and as expected the initial syllable is stressed; secondary stress falls on the final syllable.

(75)	'HHH	'kaŋ.kan.,tar	'type of top'
------	------	---------------	---------------

Based on trisyllabic words which contain at least one heavy syllable, the stress pattern can therefore be described as follows: primary stress falls on the leftmost heavy syllable and secondary stress falls on the second syllable from the primarily stressed syllable, if there is one. However, word final light syllables are not stressed.

The examples below show that when there are no heavy syllables there are several possibilities for the stress pattern in trisyllabic words. Primary stress can fall on any of the syllables in the word and secondary stress may fall on the initial syllable. In the examples in (76), primary stress falls on the penultimate syllable and there is no secondary stress.

(76)	LLL	ma.'sa.la	'East Indian dish'
		ma.'ka.ka	'type of wood boring beetle'
		pa.'ka.sa	'coconut milk and flour sauce'
		mo.'zɛ.la	'type of yam'
		ka.'ra.to	'species of Bromelia, wild pine'
		tu.'ba.ka	'tobacco'
		su.'ma.di	'somebody'
		a.'na.ta	'annatto'
		a.'nɛ.da	'another'
		ka.'ta.ri	'East Indian dish'

In the examples in (77), primary stress occurs on the initial syllable and as seen before there is no secondary stress on the word final light syllable.

(77)	'LLL	'be.ya.ka	'type of tree'
		'ta.la.wa	'strong, sturdy'
		'mo.gɪ.kɪ	'kind of mug'
		'ma.la.ta	'mulatto'
		'ku.mi.na	'type of religious dance ceremony'
		'ba.la.ho	'small piper; to flatter'
		'ba.chɪ.la	'bachelor'
		'ko.ta.ku	'type of basket'
		'du.ku.nu	'boiled pudding'
		'ka.ka.tɪ	'snobbish, hoity-toity'
		'kra.ka.sa	'type of palm tree'

The third pattern illustrated by the data in (78) places primary stress on the final syllable of the word and secondary stress on the initial syllable.

(78)	ˌLLL	ˌkɪ.tɪ.'bu	'firefly; meddlesome person'
		ˌba.ga.'bu	'generic term for various insects, worms'
		ˌba.la.'hu	'boisterous person'
		ˌa.na.'bo	'type of tree'

Either the 'LLL pattern or the pattern LLL might be considered as the general pattern as these are the more common patterns in the data. The ˌLLL words represent a mere 3.6%

of the trisyllabic words. The 'LLL pattern could be derived by assigning initial syllable primary stress when there are no heavy syllables. On the other hand, consistent with Alderete's (1993) analysis and with observations made above, the LLL pattern could be derived by assigning primary stress to the penultimate syllable as in bisyllabic 'LL words. In both cases the penultimate syllable is stressed since there are no heavy syllables. In fact, a consideration of the stress pattern on quadrasyllabic words, which I discuss further below, shows that the second analysis is preferable. That is, primary stress generally falls on the penultimate syllable in both LLL words and quadrasyllabic ,LL'LL words as it does in bisyllabic 'LL words, since there are no heavy syllables. This approach thus lends itself to a unified account of bisyllabic, trisyllabic and quadrasyllabic words with penultimate primary stress.

Further evidence for this proposal comes from the stress pattern on apparent exceptional cases. These trisyllabic words show alternate stress patterns which are not expected based on the stress patterns of other trisyllabic words with heavy syllables. The words in (79) and (80) are expected to have primary stress on the leftmost heavy syllable as in *kyaapinta* 'carpenter' or *ni'glekful* 'neglectful'. Instead, primary stress is assigned to the second heavy syllable in each word, which is precisely the pattern seen in LLL words. That is, primary stress is assigned to the penultimate syllable. As we saw in LLL words, there is no secondary stress in these words either.

- | | | |
|----------|--|--|
| (79) HHL | fan.'daŋ.gɪ
man.'tʃɛs.ta
mam.'paa.la
njuz.'moŋ.ga | 'elaborate or fussy decoration or ornament'
'Manchester'
'common cock; impotent, effeminate man'
'type of bug associated with spreading of news/gossip; person who spreads news/gossip' |
|----------|--|--|

	raa.'baa.ba	'coarse person'
(80) HHH	taa.'paa.ln	'tarpaulin'
	ad.'van.tɪdʒ	'to take advantage of; cheat'
	kan.'som.fan	'heavy cough associated with consumption disease'

A similar pattern is seen in LLH words shown in (81). These words are expected to have stress on the only heavy syllable in the word as seen in words like, *kala'ban* 'box-like trap', however, they have penultimate stress like the words in (79) and (80).

(81) LLH	to.'ma.tis	'kind of tomato'
	di.'la.rans	'Chicago publisher on occults, banned from Jamaica; witchcraft'
	pro.'vi.dʒan	'generic term for yam, cocoa, dasheen, potatoes'

The final set of trisyllabic words shown in (82) are also expected to have primary stress on the only heavy syllable in the word and secondary stress on the initial syllable as was seen in other LLH words. As seen, primary stress instead occurs on the initial syllable of the word and secondary stress occurs on the final heavy syllable. 8.3% of the trisyllabic words in this dataset have this stress pattern.

(82) 'LLH	'ba.bɪ.lan	'Rastafarian term for non-believer, white man or policeman'
	'ba.ka.lau	'codfish'
	'bo.na.bis	'type of bean/broke-pot bean'
	'ku.chu.ment	'odd and ends'
	'di.pɪ.dens	'coconut rundown (sauce)'
	'a.fɪ.kan	'African'
	'a.ni.sou	'type of bush medicine for colds'
	'gya.la.was	'type of lizard'
	'fru.ta.paŋ	'breadfruit'

To summarize, primary stress typically falls on the leftmost heavy syllable of a trisyllabic word, e.g. *'kyaapinta* ‘carpenter’, *'dzimbilin* ‘type of tree’, *ku'muudzin* ‘deceitful’, or on the only heavy syllable as in *ˌkala'ban* ‘box-like trap’. When there are no heavy syllables in the word, primary stress generally falls on the penultimate syllable as in *mo'zela* ‘type of yam’. Secondary stress is expected to fall two syllables away from the syllable with primary stress, e.g. *'bangaˌraŋ* ‘useless odds and ends’; *ˌkala'ban* ‘box-like trap’. Of course, when primary stress is on the penultimate syllable, secondary stress does not occur, as in *ma'fietid* ‘dilapidated’. In words with an alternate stress pattern, primary stress falls predominantly on the penultimate syllable whether or not there is a heavy syllable elsewhere in the word. In a few words, primary stress falls on the initial syllable with no secondary stress or primary stress occurs on the final syllable and secondary stress occurs on the initial syllable.

5.2.3 Quadrasyllabic Words

As shown in (83), in quadrasyllabic words when there are no heavy syllables, primary stress falls on the penultimate syllable as was seen in bisyllabic and trisyllabic words and secondary stress falls two syllables away from the primarily stressed syllable, i.e. on the initial syllable.

(83)	LL'LL	ba.ra.'ku.ta	'barracuda'
		bra.zi.'li.ta	'species of dye-wood'
		sa.pa.'di.la	'sapodilla (type of fruit)'
		kja.ta.'pi.la	'caterpillar'
		a.li.'gɛ.ta	'alligator'
		ba.ni.'kle.va	'sour/curdled milk'
		a.li.'ka.sha	'plant resembling a carrot'
		a.li.'bo.tɨ	'one who works without receiving payment; worthless person'
		i.ni.'kwi.tɨ	'evil, obeah, small dumpling'

As with other words seen prior, primary stress falls on the leftmost or only heavy syllable in the word in (84); secondary stress falls on the initial syllable.

(84)	LL'HH	ba.da.'rie.ʃan	'thing or person that is a source of annoyance'
	LL'HL	ba.ni.'kle.va	'sour/curdled milk'
		ka.li.'fie.va	'a type of mullet'
		ko.ri.'fie.va	'to play favorite'
		po.ko.'mie.nja	'type of revivalist cult'
		du.fi.'dai.a	'dwarfish, stunted person'
		tʃɛ.ri.'miil.ja	'a type of fruit similar to a cherry'
		gja.li.'men.ta	'Galimenta-wood'
		na.ja.'biŋ.gɨ	'subsection of the Rastafarian cult; meeting of Rastafarians'

5.2.4 Interim Summary

The data discussed above shows that the leftmost or only heavy syllable in a word receives primary stress in JC. If there are no heavy syllables, then the typical pattern is for the penultimate syllable to get primary stress. Secondary stress falls two syllables away from the syllable with primary stress but not on a word final light syllable. This generalization is consistent with the data seen in bisyllabic, trisyllabic and quadrasyllabic

words. Table 5.1 illustrates the parsing of different types of syllables for the general pattern for stress assignment.

'LL	'ma.ka	'thorn'
L'H	pa.'laav	'to lie about idly'
'HL	'pai.zɨ	'poison'
'HH	'gaa.lɨ	'egret'
L'LL	su.'ma.dɨ	'somebody'
LHL	ni.'glek.ful	'neglectful'
L'HH	gi.'laan.tɨ	'to fool around'
'HLL	'niiz.be.rɨ	'type of fruit'
'HLH	'dʒɨm.bi.lɨ	'type of tree'
'HHL	'bak.sai.dɨ	'severe beating'
'HHH	'kaŋ.kan.,tar	'type of top'
LL'HH	,ba.da.'rie.ʃan	'thing or person that is a source of annoyance'
LL'HL	po.ko.'mienya	type of revivalist cult'

Table 5.1: *General Stress Pattern in Monomorphemic Words of Different Syllable Types*

We also saw that there are also alternate patterns. In bisyllabic words, primary stress may fall on the final light syllable even the initial syllable is heavy. In trisyllabic words primary stress may fall on the penultimate syllable with no secondary stress. In addition, a few words have final primary stress and initial secondary stress or initial primary stress and no secondary stress. There are no alternate stress patterns in the quadrasyllabic words in this dataset. I will show that these alternate patterns may be accounted for in a principled manner within an Optimality Theoretic framework.

5.2.5 Compound Words

The data in this section illustrate the stress pattern on nominal compound words. I include these primarily as a source of comparison with reduplicated words since they are another productive word formation process in JC as in many creole languages. As I show in Chapter 6, this is a worthwhile exercise since the stress pattern on distributive reduplication reflects the pattern seen in compounds words, i.e. the regular pattern. Intensive reduplications on the other hand have a different pitch accent pattern than compounds and distributives. I argue that this reflects differences in the number of primary stresses permitted in intensive reduplications as opposed to compounds and distributive reduplications. In addition, in other English-based creoles like Krio and Guyanese, compounding has been shown to share similarities with reduplication processes. Nylander (1999) (Krio) and Devonish (2003) (Guyanese), for example, argue that reduplication processes exhibit similar prosodic properties to compounding.

Bisyllabic compounds are shown in (85), trisyllabic compounds in (86), quadrasyllabic compounds in (87) and longer ones in (88). The generalizations regarding the stress pattern on monomorphemic words can be extended to the stress patterns on each part of the compound word. The stress pattern on compound words is thus directly related to the stress pattern of the input word¹⁹. In the bisyllabic compounds

¹⁹ Lawton (1963) reported a different pattern for some compound words in addition to the patterns seen here. According to Lawton, the ‘tonal’ specification of some input words is altered in the compound. The transcriptions below are the same as those used in Lawton’s work, (ˉ) represents high-level tone;

(ˆ) high-falling tone and (˘) low-level tone.

būlā	‘type of cake; insult’	būlākiék	‘type of cake’
guábà	‘guava’	guábàbòd	‘guava bud’
pásñ	‘parson’	pásñbraún	‘type of orange’

From the point of view of stress, all these words have identical stress patterns to the trisyllabic compound words comprised of a bisyllabic word + monosyllabic word. That is, they have a SWS stress pattern as in *bulakiek*.

in (85) for example, each input word has primary stress and the resulting compound has two stresses. Notice however that the primary stress on the initial word is realized as a secondary stress in the compound word, e.g. *'bod* 'bird' + *'mout* 'mouth' ---> *,bod.'mout* 'pecked by a bird'.

(85)	,HH	,big.'man	'big 'big' + 'man 'man'	'adult male human'
		,bod.'mout	'bod 'bird' + 'mout 'mouth'	'pecked by a bird'
		,blak.'mint	'blak 'black' + 'mint 'mint'	'variety of mint'
		,blak.'krab	'blak 'black' + 'krab 'crab'	'variety of crab'
		,krab.'tatʃ	'krab 'crab' + 'tatʃ 'thatch'	'variety of thatch'
		,krab.'yaaz	'krab 'crab' + 'yaaz 'yaws'	'type of foot disease'
		,haas.'baat	'haas 'horse + 'baat 'bath'	'weed used to scrub horses'
		,biif.'biin	'biif 'beef' + 'biin 'bean'	'brown beans eaten with beef'

In trisyllabic compounds in (86) the location of the stresses also reflects the pattern on the input words, e.g. *'baa.bl'* 'barble' + *'dov* 'dove' ---> *,baa.bl.'dov* 'type of dove'. As is expected, based on the pattern in bisyllabic compounds, the primary stress of the input word *'baa.bl'* 'barble' is realized as a secondary stress in the compound word.

(86)	,LLH	,bɛ.li.'hat	'bɛ.li 'belly' + 'hat 'hurt'	'stomach ache'
		,bɛ.li.'gad	'bɛ.li 'belly' + 'gad 'god'	'glutton'
		,do.tɪ.'gjal	'do.tɪ 'dirty' + 'gjal 'girl'	'type of laundry soap'
		,ku.li.'plom	'ku.li 'Indian' + 'plom 'plum'	'type of plum'
		,big. 'sɱa.di	'big 'big' + su.'ma.di	'adult person' ²⁰
			'somebody'	
	,HLH	,baa.bl.'dov	'baa.bl 'barble' + 'dov 'dove'	'type of dove'
		,baa.bl.'dʒak	'baa.bl 'barble' + 'dʒak 'Jack'	'large male donkey'
		,daŋ.kɪ.'ruop	'daŋ.kɪ 'donkey' + 'ruop 'rope'	'tobacco leaves rolled into a rope'
		,daŋ.kɪ.'wiid	'daŋ.kɪ 'donkey' + 'wiid 'weed'	'plant that looks like thyme'
	,HHL	,big 'fiŋ.ga	'big 'big' + 'fiŋ.ga 'finger'	'thumb'

²⁰ The initial unstressed syllable of *su.'ma.di* 'somebody' is often deleted as it is in the formation of the compound in this example.

Quadrasyllabic compounds shown in (87) generally have primary stress on the penultimate syllable and secondary stress on the second syllable preceding the penultimate syllable. In these cases the input words are two bisyllabic words each with primary stress on the initial syllable, e.g. *'ba.mi* 'bammy' + *'pre.sa* presser → *,ba.mi 'pre.sa* 'tool for flattening type of cassava bread'; *'baa.buun* 'baboon' + *'kuo.ko* 'cocoa' → *,baa.buun.'kuo.ko* 'type of cocoa'. As before, the primary stress on the first input word is realized as secondary stress in the compound. Notice that though the stress pattern on *ka.,saa.va 'puon* 'cassava pudding' is different, it is consistent with the generalizations made above. That is, the observed stress pattern is reflective of the stress pattern on the input words, *ka.'saa.va* 'cassava and *'puon* 'pudding'.

(87)	LLLH	,ba.kra 'kya.bɪdʒ	'ba.kra 'Caucasian' + 'kya.bɪdʒ 'cabbage'	'type of cabbage'
		,be.li.'u.man	'be.li 'belly' + 'u.man 'woman'	'pregnant woman'
	LLLL	,ba.mi 'pre.sa	'ba.mi 'bammy' + 'pre.sa 'presser'	'tool for flattening bammies'
		,ku.ku.'ma.ka	'ku.ku 'coco' + 'ma.ka 'thorn'	'heavy stick with thorns'
		,ku.li 'pe.pa	'ku.li 'Indian' + 'pe.pa 'pepper'	'type of pepper'
	HHHL	,baa.buun.'kuo.ko	'baa.buun 'baboon' + 'kuo.ko 'cocoa'	'type of cocoa'
		,baas.tad.'sii.da	'baas.tad 'bastard' + 'sii.da 'cedar'	'wild cedar'
	HHLH	,baas.tad.'o.kro	'baas.tad 'bastard' + 'o.kro 'okra'	'wild okra'
	LLHL	,li.kl.'fiŋ.ga	'li.kl 'little' + 'fiŋ.ga 'finger'	'little finger'
		,do.tri.'boŋ.gɪ	'do.tri 'dirty' + 'boŋ.gɪ 'bundle'	'untidy person'
		,ti.ti.'bai.ta	'ti.ti 'breast' + 'bai.ta 'biter'	'insect'
	HL'LH	,tʃai.ni 'kja.bɪdʒ	'tʃai.ni 'Chinese' + 'kja.bɪdʒ 'cabbage'	'type of cabbage'
	HL'HL	,tʃuo.tʃo.'aa.ba	'tʃuo.tʃo 'squash' + 'aa.ba 'arbor'	'trellis for type of squash plant'
	HL'HL	,aa.tʃi.'bom.bo	'aa.tʃi 'saltfish fritters' + 'bombo 'expletive'	'obscene name for saltfish fritters'
	LHLH	,kro.km.'li.zad	'kro.km 'croaking' + 'li.zad 'lizard'	'type of lizard'
	HH'LL	,kro.km.'dro.ma	'kro.km 'croaking' + 'dro.ma 'drummer'	'type of fish'
	L,HL'H	ka.,saa.va 'puon	ka.,saa.va 'cassava' + 'puon 'pudding'	'cassava pudding'

The stress pattern on longer compounds shown in (88) similarly reflects the stress patterns of the input words; the primary stress on the first input word is again realized as secondary stress.

- (88) ,LLL'HL ,bi.ta.ka.'saa.va 'bi.ta 'bitter + ka.,saa.va 'cassava' 'type of cassava'
 L,HL'HL ka.,saa.va 'flau.wa ka.,saa.va 'cassava' + 'flau.wa 'flour' 'cassava flour'

To summarize, the stress pattern in compounds depends on the stress pattern of the input words. Primary stress on the first member of the compound is realized as secondary stress in the compound word. In addition, the rightmost member of all the compounds is the strongest, i.e. has main stress. For example, ,*haas'baat* 'weed used to scrub horses'; ,*bel'gad* 'glutton'; ,*kuku'maka* 'heavy stick with thorns'.

5.3 Summary

As we have seen, in monomorphemic words primary stress generally falls on the leftmost heavy syllable. If there is no heavy syllable, primary stress falls on the penultimate syllable of a word. Secondary stress falls two syllables away from the syllable with primary stress, if there is such a syllable except in the case of word final light syllables which do not bear stress. In the majority of cases, stress falls on the initial or penultimate syllable of a word and falls only rarely on the final syllable. Where secondary stress falls on a word final syllable it is typically a heavy syllable. These patterns are reflective of the general pattern for 90% of the words in the database.

In the section below, I account for the general and alternate stress patterns within an Optimality Theoretic framework.

5.4 Predicting Stress Assignment in JC - An Optimality Theoretic Account

5.4.1 General Pattern

In this section, I present an analysis of stress formulated within an Optimality Theoretic (OT) framework. As is outlined in Chapter 1, this is a constraint-based approach to phonological well-formedness. Based on the observations on stress assignment discussed in the preceding sections, the following general statements can be made regarding the predominant pattern for stress assignment in monomorphemic words in JC:

- (i) primary stress falls on the leftmost heavy syllable otherwise;
- (ii) primary stress falls on the penultimate syllable
- (iii) secondary stress falls on the syllable two syllable away from that with primary stress, if there is one, but not on a word final light syllable.

In deriving the stress assignment on compounds, I assume that each monomorphemic input word receives stress as outlined in (i) through (iii). However, the additional statements in (iv) and (v) are also required for compounds:

- (iv) the rightmost member of the compound has primary stress;
- (v) primary stress on the input word of the leftmost member is realized as secondary stress.

The first type of data I discuss are non-compound words with a sequence of two light syllables, e.g. *kafa* ‘type of thorny tree’. Words like these were shown to have primary stress on the initial syllable. I refer to the constraints given in (89) in accounting for the stress pattern on these words.

(89) Parse Syllable (PARSESYL): Syllables are parsed into feet (Prince and Smolensky, 1993)

Foot Type (FTTYPE_[TROCH]): Feet are trochaic (ibid, 1993)

The constraint PARSESYL requires syllables within a given word to be grouped into feet. The FTTYPE constraint requires prosodic feet to be a sequence of LL or HL syllables or a single H or L syllable which are all types of trochaic feet. Prince (1990), proposes the following trochaic rhythmic harmony scale in (90):

(90) (LL, H) > HL > L

Informally, this suggests that trochaic feet comprised of a sequence of LL syllables or a single H syllable are preferable to those comprised of a sequence of HL syllables which are in turn preferable to feet with a single L syllable²¹.

Tableau 5.1 shows the evaluation of the bisyllabic 'LL word *kafa* 'type of thorny tree'. In this and other tableaux, foot constituency is indicated by parentheses.

²¹ Kager (1999:172) and Prince and Smolensky (1993) suggest that LH and HH feet with initial stress are also trochaic feet but they violate the constraint Weight-to-Stress-Principle (WSP), which requires heavy syllables to be stressed.

		FTTYPE (TROCH)	PARSESYL
☞	a. ('kaʃa)		
	b. ('ka)ʃa		*!
	c. (ka'ʃa)	*!	
	d. kaʃa		*!*

Tableau 5.1: ['kaʃa] 'type of thorny tree'

Candidate (a) is the winning candidate since both of its syllables are parsed into feet forming a trochaic (LL) foot. This candidate satisfies both of the constraints considered. One of the syllables in candidate (b) is not parsed into a foot causing the candidate to incur a fatal violation of PARSESYL, which rules it out. Both syllables in candidate (c) are parsed into feet but main stress is on the second syllable. This does not form a trochaic foot, since it is right-headed ($L_W L_S$) instead of left-headed ($L_S L_W$). This candidate incurs a fatal violation of FTTYPE and is ruled out as well. None of the syllables in candidate (d) are parsed into feet, consequently it fails on the PARSESYL constraint.

The constraint in (91) prohibits a sequence of two stresses in a word. This is instrumental in ruling out the illformed candidate (d) in Tableau 5.2, which has secondary stress on the final syllable.

(91) * CLASH No stressed syllables are adjacent (Kager, 1999)

		* CLASH	FTTYPE (TROCH)	PARSESYL
☞	a. (ka]fa)			
	b. ('ka)]fa			*!
	c. (ka'fa)		*!	
	d. ('ka)(]a)	*!		

Tableau 5.2: ['ka]fa] 'type of thorny tree'

This predicts that there is no secondary stress in bisyllabic words since this would produce a sequence of two stresses. I will motivate the ranking of * CLASH, FTTYPE, and PARSESYL further below.

The selection of a trisyllabic LLL word highlights the importance of having binary feet. The constraint which requires binary feet is given in (92).

(92) Foot Binarity (FTBIN): Feet are binary under a moraic or syllabic analysis

(Prince and Smolensky, 1993; McCarthy and Prince, 1986, 1993)

In Tableau 5.3, candidate (b) is selected as optimal. Candidate (a) has one unparsed syllable as does candidate (b) but it incurs a fatal violation of FTTYPE which rules it out. Candidate (c) is ruled out by FTBIN and candidate (d) is ruled out by * CLASH. Candidate (e) has a single violation as does the winning candidate (b). The crucial ranking of FTBIN above PARSESYL rules out the suboptimal candidate (e).

		* CLASH	FTBIN	PARSESYL	FTTYPE (TROCH)
	a.(mo'zɛ)la			*	*!
☞	b. mo ('zɛla)			*	
	c.(mo)(zɛ,la)		*!		*
	d. ('mo)(zɛla)	*!	*		
	e. (mozɛ)(,la)		*!		

Tableau 5.3: [mo'zɛla] 'type of yam'

This tableau correctly predicts the general stress pattern on trisyllabic LLL words with main stress on the penultimate syllable. I discuss alternate patterns in section 5.4.2.

With the constraints thus far we are also able to predict stress assignment in quadrasyllabic LLLL words as is illustrated in Tableau 5.4.

		*CLASH	FTBIN	PARSESYL	FTTYPE (TROCH)
☞	a. (a,li)'(gɛta)				
	b. (a,li) ('gɛ)ta		*!	*	
	c. (a,li) gɛ ('ta)		*!	*	
	d. (a)(li'gɛ)ta		*!	*	*
	e. (a,li) ('gɛta)	*!			*

Tableau 5.4: [a,li'gɛta] 'alligator'

As shown here, the optimal candidate is (a), which has no violations of the constraints considered. Candidates (b) and (c) lose since they fatally violate FTBIN and PARSESYL. Candidate (d) is the worst; it violates three of the constraints considered. Candidate (e) is ruled out since it has a sequence of two adjacent stresses which causes a fatal violation of *CLASH.

Notice however, that so far no distinction has been made regarding which syllable has primary stress and which one has secondary stress; the constraints simply predict which syllables are prominent. Consider candidates (a) and (b) in Tableau 5.5 below. Both candidates satisfy all of the constraints considered having stresses on the initial and on the penultimate syllable. As was noted above, in words with all light syllables, primary stress falls on the penultimate syllable and secondary stress falls on alternating syllables starting from the syllable with main stress as in candidate (a).

		*CLASH	FTBIN	PARSESYL	FTTYPE (TROCH)
☞	a. (aI)('gɛta)				
☞	b. ('aI) (gɛta)				
	c. (aI) ('gɛ)ta		*!	*	
	d. (aI) gɛ ('ta)		*!	*	

Tableau 5.5: [aIɾgɛta] 'alligator'

In order to differentiate between the primarily and secondarily stressed syllables, two additional constraints are needed. The specific constraints are given in (93). The constraint ALIGNHD refers specifically to the foot with main stress, i.e. the prosodic head. It places the foot with main stress at the right edge of the word. ALIGNFT places a foot at the right edge of a prosodic word.

(93) Align (Head, Right; Prosodic word, Right) (ALIGNHD(R)): The right edge of a prosodic head foot is aligned to the right edge of a prosodic word. (Hammond, 1999; Kager, 1999)

Align (Foot, Right; Prosodic word, Right) (ALIGNFT(R)): The right edge of a prosodic foot is aligned to the right edge of a prosodic word. (Kager, *ibid*)

In Tableau 5.6, as in subsequent ones, prosodic word constituency is indicated by square brackets []. As shown, ALIGNHD is crucial in ruling out the illformed candidate (b), which incurs two fatal violations of the constraint. Violations of ALIGN are evaluated based on the number of syllables between any foot or head foot and the edge of the word, in this case the right edge. Candidate (a) has one foot that is two syllables removed from the right edge of the word and so it incurs two violations of ALIGNFT. Its head foot is flush with the right edge of the word completely satisfying ALIGNHD. Candidate (b) also has two violations of ALIGNFT. However, its head foot is two syllables away from the right edge of the word (word initially) so it incurs two fatal violations of ALIGNHD which rules it out. Both candidates (c) and (d) are ruled out by FTBIN. This tableau correctly predicts primary stress on the penultimate syllable and secondary stress on the initial syllable. At this point there is no crucial ranking among ALIGNHD(R), ALIGNFT(R) and FTTYPE.

		*CLASH	FTBIN	PARSE SYL	FTTYPE (TROCH)	ALIGN HD(R)	ALIGN FT(R)
☞	a. [(alɪ)(gɛta)]						**
	b. [(ˈalɪ)(gɛta)]					**!	**
	c. [(alɪ) (gɛ)ta]		*!	*		*	***
	d. [(alɪ)gɛ (ˈta)]		*!	*			**

Tableau 5.6: [alɪ'gɛta] 'alligator'

The next examples which I discuss are those for which syllable weight is important to stress assignment. Recall that primary stress is assigned to the leftmost or only heavy syllable in a word. For example, a bisyllabic L'H word such as *a'kam* 'keloid' has stress on the leftmost heavy syllable which in this case is the final syllable. Tableau 5.7 illustrates that the constraints established thus far are not sufficient to predict stress assignment in these words. In this example, the wrong surface form is predicted; this is indicated by the symbol ☹*.

		*CLASH	FTBIN	PARSE SYL	FTTYPE (TROCH)	ALIGN HD(R)	ALIGN FT(R)
	a. [a('kam)]			*!			
	b. [('a'kam)]				*!		
	c. [(a)('kam)]	*!	*				*
☹*	d. [(ˈakam)]						
	e. [akam]			*!*			
	f. [(ˈa) kam]		*!	*			*

Tableau 5.7: [a'kam] 'keloid'

Primary stress should be assigned to the heavy syllable, however, none of the constraints thus far refer to syllable weight. The constraint Weight-to-Stress (WSP), given in (94),

requires heavy syllables to be stressed and also reflects the tendency for heavy syllables to be stressed in JC. As discussed earlier, for syllables to be heavy, coda consonants, long vowels and diphthongs are assumed to contribute to syllable weight²².

(94) WEIGHT-TO-STRESS (WSP): Heavy syllables are stressed (Hammond, 1999).

Tableau 5.8 reevaluates the candidates in Tableau 5.7 with the inclusion of WSP.

		*CLASH	FTBIN	WSP	FTTYPE (TROCH)	PARSE SYL	ALIGN HD(R)	ALIGN FT(R)
☞	a. [a('kam)]					*		
	b. [(a'kam)]				*!			
	c. [(a)('kam)]	*!	*					*
	d. [('akam)]			*!				
	e. [akam]			*!		**		
	f. [(a) kam]		*!	*		*		*

Tableau 5.8: [a'kam] 'keloid'

With the inclusion of WSP, candidate (a) is correctly predicted as the optimal candidate. This establishes that WSP is crucially ranked above PARSESYL or else we would predict the illformed candidate (d) as the surface form since it has only one violation of the constraints considered as does candidate (a). This shows that it is more important for a heavy syllable to be stressed than for all syllables to be parsed into feet. In addition, although candidate (b) is phonetically identical to candidate (a), it has a right-headed (iambic) foot and is therefore dispreferred. This also establishes a crucial ranking of

²² I assume that the constraint WEIGHT-BY-POSITION (WP) is also at work here (Kager, 1999). WP captures the observation that coda consonants are moraic. Thus, they contribute to syllable weight.

FTTYPE above PARSESYL or else candidate (b) would be incorrectly predicted as the surface form. Notice also that consistent with these observations, bisyllabic LH words are not predicted to have secondary stress since this would cause a violation of *CLASH.

The inclusion of WSP also correctly predicts that 'HL words like *'gandʒa* 'marijuana' will have stress on the first syllable since that syllable is heavy. Tableau 5.9 shows that we are able to predict the correct surface form with the constraints introduced thus far. I have excluded the Align constraints from further evaluation of bisyllabic words since these words are predicted not to have secondary stress.

	*CLASH	FTBIN	WSP	FTTYPE (TROCH)	PARSE SYL
a. [('gan)dʒa]					*!
☞ b. [('gandʒa)]					
c. [(gan'dʒa)]				*!	
d. [(,gan)('dʒa)]	*!	*			
e. [gan('dʒa)]		*!	*		*

Tableau 5.9: ['gandʒa] 'marijuana'

Candidate (b) wins since it does not have any violations of the constraints considered. Candidate (a) fails on the PARSESYL constraint and candidate (c) fails since it has an iambic foot. Candidate (d) has two adjacent stressed syllables which causes a fatal violation of *CLASH. Candidate (e) has a stressed light syllable which results in a fatal violation of FTBIN; it violates other constraints as well. All of these latter candidates are thus ruled out.

These constraints trivially account for trisyllabic 'HLL words like *'ganga* 'ruffian, bully'; L'HL words, e.g. *su'sumba* 'type of wild bean' and LL'H, e.g. *kala'ban* 'box-like trap'. This is illustrated in Tableau 5.10 through Tableau 5.12. In Tableau 5.10, candidate (d) is selected as optimal since it has only minimal violations of the lower ranked constraints and crucially does not violate any of the higher ranked constraints, as is the case with the losing candidates.


	*CLASH	FTBIN	WSP	FTTYPE (TROCH)	PARSE SYL	ALIGN HD(R)	ALIGN FT(R)
a. [(<i>'ganga</i>)(<i>lu</i>)]		*!				*	*
b. [(<i>gaŋ</i>) <i>galu</i>]					**!	**	**
c. [(<i>gaŋ</i>)(<i>galu</i>)]	*!					**	**
 d. [(<i>gaŋga</i>) <i>lu</i>]					*	*	*
e. [(<i>gaŋ'ga</i>) <i>lu</i>]			*!	*	*	*	*
f. [(<i>gaŋga</i>)(<i>'lu</i>)]		*!					*

Tableau 5.10: [*'ganga*lu] 'ruffian, bully'

This correctly predicts that there is no secondary stress on a word final light syllable. In this case candidate (d) is selected as optimal. Candidate (a) closely competes with candidate (d), however, it has a fatal violation of FTBIN which eliminates it. Candidate (c) has another stress adjacent to the stress on the initial syllable which causes it to violate the highly ranked *CLASH constraint. Candidate (e) fails on several of the constraints, FTTYPE, WSP and PARSESYL and is ruled out. Candidate (f), which primary stress on the word final syllable and secondary stress on the initial syllable, is ruled out by FTBIN. The preference of candidate (d) over candidate (a) in this tableau shows that it is not as

important to have exhaustive footing as it is to have binary feet. This correctly predicts that there is no secondary stress on word final light syllables. Notice also that the prohibition on footed word final light syllables is also extended to candidate (f) which as noted above fails on FTBIN.

Tableau 5.11 illustrates the evaluation of a LHL word, *su'sumba* 'wild bean', which has primary stress on the penultimate syllable.

		*CLASH	FT BIN	WSP	FTTYPE (TROCH)	PARSE SYL	ALIGN HD(R)	ALIGN FT(R)
	a. [(su'sum)ba]				*!	*	*	*
☞	b. [su('sumba)]					*		
	c. [su('sum)ba]					**!	*	*
	d. [(susum)ba]			*!		*	*	*
	e. [(susum)(ba)]		*!	*			*	*

Tableau 5.11: [su'sumba] 'wild bean'

The correct output form is candidate (b) which only has violations of the lowly ranked PARSESYL constraint. The closest competing candidate, (a), which also has penultimate stress fails on FTTYPE since it creates an iambic foot (L_wH_s) instead of a trochaic foot.

Given the constraints posited thus far, two types of stresses are predicted to occur in trisyllabic LLH words such as *kala'ban* 'box like trap', shown in Tableau 5.12. The word has primary stress on the final syllable and secondary stress on the initial syllable.

		*CLASH	FTBIN	WSP	FTTYPE (TROCH)	PARSE SYL	ALIGN HD(R)	ALIGN FT(R)
	a. [ka (la'ban)]				*!	*		
	b. [kala ('ban)]					*!*		
☞	c. [(kala)('ban)]							*
	d. [(ka,la)('ban)]	*!			*			*
	e. [('kala)(ban)]						*!	*

Tableau 5.12: [kala'ban] ‘box like trap’

As seen, candidate (c) wins since it has a single violation of the lowly ranked ALIGNFT constraint. Candidate (a) is ruled out by FTTYPE. Candidate (b) which does not have secondary stress fatally violates PARSESYL and is ruled out. Candidate (d) fatally violates *clash and candidate (e), the closest competing candidate, which has primary stress on the initial syllable and secondary stress on the final syllable, fails on ALIGNHD. This establishes a crucial ranking of ALIGNHD above ALIGNFT. Thus far there is no crucial ranking between WSP and FTTYPE.

Tableau 5.13 illustrates that the stress pattern on LL'HL quadrasyllabic words is also predictable given the constraint ranking established thus far.

		*CLASH	FT BIN	WSP	FTTYPE (TROCH)	PARSE SYL	ALIGN HD(R)	ALIGN FT(R)
☞	a. [(gjalɪ)('menta)]							**
	b. [(gjalɪ) ('men)ta]					*!	*	**, *
	c. [(gja)lɪrmen)ta]		*!		*	*	*	***, *
	d. [(gjalɪ)men('ta)]		*!	*		*		**
	e. [(gja,lɪ) ('menta)]	*!			*			**
	f. [(gjalɪ)(,menta)]						***!	**

Tableau 5.13: [gjalɪrmenta] ‘type of wood’

Candidate (a) wins since it only violates the lowly ranked ALIGNFT constraint. The closest competing candidate, (f), is eliminated due to fatal violations of the ALIGNHD constraint.

All the examples I have discussed thus far have just one heavy syllable. The following examples illustrate how stress is predicted in words with more than one heavy syllable. Recall that these words have primary stress on the leftmost heavy syllable and secondary stress two syllables away from the main stress. In the bisyllabic word in Tableau 5.14 there are two heavy syllables, so we need to be able to predict which one will be assigned stress.

	*CLASH	FTBIN	WSP	FTTYPE (TROCH)	PARSE SYL	ALIGN HD(R)	ALIGN FT(R)
a. [(ˈgaa)lin]			*		*!	*	*
☞ b. [(ˈgaalin)]			*				
c. [(ˈgaa)(lin)]	*!					*	*
d. [gaa(ˈlin)]			*		*!		

Tableau 5.14: [ˈgaalin] ‘egret’

This tableau shows that the constraint ranking thus far is able to predict the stress pattern on words with more than one heavy syllable. The correct surface form, candidate (b), with stress on the initial syllable is selected as optimal since its only violation is of the WSP constraint. The closest competing candidate in (d), which also has a violation of WSP, is ruled out by PARSESYL.

Accounting for trisyllabic words with more than one heavy syllable is a bit more involved. In particular, the observation that the leftmost heavy syllable is stressed conflicts with the need to have the head foot at the right edge of the word. This is illustrated in Tableau 5.15 with the word *'baŋga,raŋ* 'useless odds and ends'. As seen here, the correct surface form, candidate (a) with primary stress on the initial syllable is ruled out by ALIGNHD(R), which requires that the head foot be at the right edge of the word. The favored candidate is the illformed candidate (b) with initial secondary stress and final primary stress.


	*CLASH	FT BIN	WSP	FTTYPE (TROCH)	PARSE SYL	ALIGN HD(R)	ALIGN FT(R)
a. [(<i>'</i> baŋga)(raŋ)]						*!	*
 b. [(baŋga)(<i>'</i> raŋ)]							*
c. [(<i>'</i> baŋ)ga(raŋ)]					*!	**	**

Tableau 5.15: [*'*baŋga,raŋ] 'useless odds and ends'

To resolve this issue, I propose the constraint ALIGNL in (95), which specifically requires the bimoraic head foot to be leftmost in the word. As formulated, ALIGNL thus forces the heavy syllable with main stress in Tableau 5.15 to be in word initial position, where φ = prosodic head.

(95) Align (Heavy Head ($\varphi_{\mu\mu}$), Left; Prosodic word, Left) (ALIGNHD($\varphi_{\mu\mu}$) (L)):

The left edge of a heavy prosodic head is aligned to the left edge of a prosodic word.

Tableau 5.16 demonstrates the function of this constraint with the reevaluation of the candidates in Tableau 5.15.

		*CLASH	FT BIN	WSP	FTTYPE (TROCH)	PARSE SYL	ALIGNHD (φ_{μ}) (L)	ALIGN HD(R)	ALIGN FT(R)
☞	a. [(<i>baŋga</i>)(<i>raŋ</i>)]							*	*
	b. [(<i>baŋga</i>)(<i>raŋ</i>)]						*!*		*
	c. [(<i>baŋ</i>) <i>ga</i> (<i>raŋ</i>)]					*!		**	**

Tableau 5.16: [*baŋga,raŋ*] ‘useless odds and ends’

In this case candidate (a) is correctly selected as optimal. The initial heavy syllable has primary stress and the final syllable has secondary stress. The illformed candidate (b) fatally violates ALIGNHD(L) and is ruled out. Candidate (c) satisfies ALIGNHD(L) but is eliminated by PARSESYL. This shows that in trisyllabic words with more than one heavy syllable, having the heavy foot with main stress leftmost in the word takes precedence over aligning prosodic feet with the right edge of the word.

Tableaux 5.17 and 5.18 show that these constraints trivially account for trisyllabic LHH and HHH words. In Tableau 5.17, candidate (a) is chosen as optimal as it has the least number of constraint violations. The crucial ranking of *CLASH above ALIGNHD(L) rules out candidate (c). Likewise, the ranking of FTBIN above ALIGNHD(L) rules out candidate (e). Candidate (b) is ruled out by PARSEYL, candidate (d) by ALIGNHD(L) and candidate (f) by FTTYPE.

		*CLASH	FTBIN	ALIGNHD (φ_{HD}) (L)	WSP	FTTYPE (TROCH)	PARSE SYL	ALIGN HD(R)	ALIGN FT(R)
☞	a.[ma ('jietd)]			*	*		*		
	b.[ma('jie)td]			*	*		**!	*	*
	c.[(ma'jie)(td)]	*!				*		*	*
	d.[(ma'jie)(td)]			**!	*				*
	e.['(ma)jie(td)]		*!		*		*	**	**
	f. [(ma'jie) td]			*	*	*!	*	*	*

Tableau 5.17: [ma'jietd] ‘dilapidated, of ill appearance’

The example in Tableau 5.18 shows the selection of a trisyllabic 'HHH word. In this case primary stress is predicted to occur on the initial heavy syllable and secondary stress on the final syllable.

		*CLASH	FTBIN	ALIGNHD (φ_{HD}) (L)	WSP	FTTYPE (TROCH)	PARSE SYL	ALIGN HD(R)	ALIGN FT(R)
☞	a. ('kaŋkan)(tar)				*			*	*
	b. ('kaŋ)kan(tar)				*		*!	**	**
	c. (kaŋkan)(tar)			*!*	*				*
	d. ('kaŋ)(kan)tar	*!			*		*	**	**,*
	e. (kaŋ)kan(tar)			*!	*		*		**

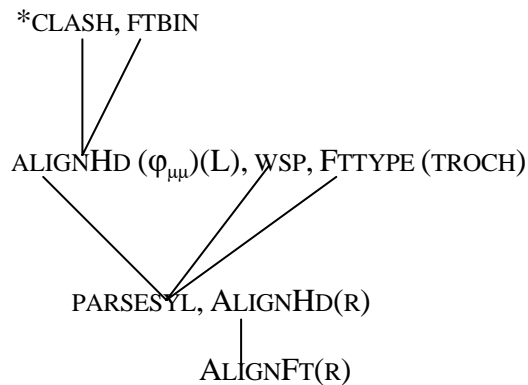
Tableau 5.18: ['kaŋkan,tar] ‘type of top’

Candidate (a) is correctly chosen as the optimal candidate; it satisfies ALIGNHD(L) at the expense of a violation of ALIGNHD(R). The closest competing candidate, (c), satisfies ALIGNHD(R) but incurs two fatal violations of ALIGNHD(L) and is eliminated. Candidate

(b) also satisfies ALIGNHD(L) but fails on PARSESYL and (d) is ruled out since it incurs a fatal violation of *CLASH. In this case a violation of ALIGNHD(R) is less critical than a violation of the highly ranked ALIGNHD(L) constraint.

The constraint hierarchy thus far is as shown in the diagram in (96). The commas between the constraints represent non-crucial rankings and the connecting lines represent the crucial dominance relationships among the constraints.

(96) *Constraint hierarchy for JC General Stress Pattern*



With this constraint hierarchy we are able to account for the general stress pattern observed in the data. Informally, this means that words with wellformed stress patterns cannot have adjacent stresses (*CLASH) and must have binary feet (FTBIN). In addition, the stressed syllables must be heavy, must be trochaic feet and be initial in the word (WSP, FTTYPE, ALIGNHD(L)). Of less importance is the need for syllables to be parsed into feet and for the main stress to be at the right edge of the word. These requirements are together more important than the general need to have prosodic feet at the right edge of the word (ALIGNFT(R)).

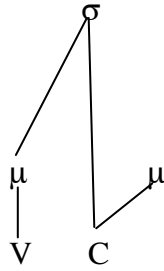
5.4.2 Alternate Patterns

I now focus the discussion on several words with stress patterns different from those predicted for the general pattern described above. With regard to bisyllabic words with contrastive stress, only those forms that have a different stress pattern from the general pattern are problematic. Among these are HL and LL words with second syllable stress, e.g. *faa'da* 'male religious leader'; *ma'da* 'female religious leader'. All the other forms can be accounted for given the constraint hierarchy in (96). For example, initial syllable stress is correctly predicted to occur in bisyllabic 'HL and 'LL words, e.g. *'faada* 'father', *'mada* 'mother'. For words with the alternate pattern, the regular SW stress pattern is reversed to a WS pattern. Some additional evidence for this proposal comes from the variation in stress pattern observed in some words, e.g. *'piepa~pie'pa* 'paper'. Interestingly, none of the words with a WS stress pattern have the canonical iambic pattern, i.e. LH. I assume that words with a WS stress pattern are lexically marked and are assigned stress in the input.

There are also words which pattern as if they are comprised of only light syllables. These are 'LH, HHL, HHH and LLH words, which all have stress on the penultimate syllable instead of the predicted leftmost heavy syllable. I assume that in these cases, the mora of coda consonants, which would normally contribute to syllable weight, is unparsed. Thus, coda consonants in these words are assumed to have the structure shown in (97)²³.

²³ The reader can compare this structure to the one in (11b) shown in Chapter 1, in which the mora of the coda consonant is parsed.

(97)



(Prince and Smolensky 1993: 70)

Following Prince and Smolensky (1993), the final consonants in these words can be analysed as directly adjoining the syllable. As such, the potentially contributing mora is not ‘seen’ by the syllable and cannot contribute to syllable weight, i.e. it is extraprosodic. Given their structure, these words necessarily violate the weight-by-position principle given in footnote 22 (repeated in (98)).

(98) WEIGHT-BY-POSITION(WP): Coda consonants are moraic. (Kager, 1999)

In the regular cases, the WP constraint is assumed to be undominated since heavy syllables are invariably stressed. As I show just below, to account for cases with the alternate stress pattern, we can posit a constraint hierarchy similar to that in (96), but crucially with the WP constraint ranked low.

Tableau 5.19 shows how the stress pattern on 'LH words is predicted. Recall that these pattern like bisyllabic 'LL words, which have primary stress on the penultimate syllable. In this and subsequent tableaux, the form with the nonmoraic coda consonant is marked with (˘).

		*CLASH	FTBIN	WSP	FTYPE (TROCH)	PARSE SYL	ALIGN HD(R)	ALIGN FT(R)	WP
☞	a. [('bafan̄)]								*
	b. [('bafan)]			*!					
	c. [ba ('fan)]					*!			
	d. [('ba) ('fan)]	*!	*				*	*	

Tableau 5.19: ['bafan] ‘clumsy person’

Candidate (a) with the extraprosodic coda consonant is selected as optimal since its only violation is of the lowly ranked WP constraint. The competing candidate in (b) has a moraic coda consonant so WP is satisfied. However, this heavy syllable is not stressed, which results in a fatal violation of the highly ranked WSP constraint. Candidate (c), which has the regular pattern, is ruled out by PARSESYL.

Tableau 5.20 illustrates the selection of a HHL word. Candidate (a) is selected as optimal since it has the least number of violations of the constraints considered. Candidate (d) has initial primary stress, which is the regular stress pattern. It satisfies WP but is eliminated by WSP since it has a heavy syllable that is not stressed.

		*CLASH	FTBIN	ALIGNHD ($\Phi_{\mu\mu}$) (L)	WSP	FTYPE (TROCH)	PARSE SYL	ALIGN HD(R)	ALIGN FT(R)	WP
☞	a.[fan ⁻ (daŋ ⁻ gɿ)]						*			**
	b.[fan (daŋgɿ)]			*!	*		*			
	c.[(fan)(daŋ) gɿ]	*!		*			*	*	**,*	
	d.[(fandaŋ)gɿ]				*!		*	*	*	
	e.[(fan)daŋ (gɿ)]		*!		*		*	**	**	

Tableau 5.20:[fan'daŋgɿ] ‘elaborate ornament’

As illustrated in Tableau 5.21, penultimate syllable stress is also correctly predicted for trisyllabic HHH words. Candidate (a) is selected as optimal since it has the least number of violations of the constraints considered. Candidate (d) reflects the regular stress pattern but is eliminated by WSP since it has a stressless heavy syllable.

		*CLASH	FTBIN	ALIGNHD ($\Phi_{\mu\mu}$) (L)	WSP	FTYPE (TROCH)	PARSE SYL	ALIGN HD(R)	ALIGN FT(R)	WP
☞	a. ad ⁻ (van ⁻ tid ³⁻)						*			***
	b. ad(vantid ³)			*!	**		*			
	c. ad(van) tid ³			*!	**		**	*	*	
	d. (ad)van(tid ³)				*!		*	**	**	
	e. (ad)van(tid ³)			**!	*		*		**	

Tableau 5.21:[ad'vantid³] ‘to take advantage of, cheat’

Tableau 5.22 shows the evaluation of LLH words. As shown, the predicted winner is candidate (a) and the regular form, candidate (d) is eliminated by $\text{ALIGNHD}(\varphi_{\mu\mu})(L)$.

		*CLASH	FTBIN	ALIGNHD ($\varphi_{\mu\mu}$)(L)	WSP	FTYPE (TROC)	PARSE SYL	ALIGN HD(R)	ALIGN FT(R)	WP
☞	a. pro('vidʒan ⁻)									*
	b. pro('vidʒan)				*!		*			
	c. (pro'vi) dʒan				*!	*	*	*	*	
	d. (provi)(dʒan)			**!						

Tableau 5.22: [pro'vidʒan] ‘generic term for yam, potatoes etc.’

I now discuss 'LL_iH and 'LLL words, which have the prosodic head at the left edge of the word instead of at the right edge as in regular cases. To account for the stress pattern on these words, I assume the constraints in (99), which require the head foot to be word initial. These constraints are similar to the align constraints posited in the account of words with a regular stress pattern (see 93). Further, I assume that these constraints are relevant only for the evaluation of lexically marked words such as 'LL_iH and 'LLL words.

(99) Align (Head, Left; Prosodic word, Right) ($\text{ALIGNHD}(L)$): The left edge of a prosodic head foot is aligned to the left edge of a prosodic word.

Align (Foot, Left; Prosodic word, Left) ($\text{ALIGNFT}(L)$): The left edge of a prosodic foot is aligned to the left edge of a prosodic word.

Tableau 5.23 shows the selection of the trisyllabic 'LLL word *kumina* 'type of religious dance ceremony'. This word has initial primary stress and no secondary stress. As demonstrated, the crucial ranking of ALIGNHD(L) and ALIGNHD(L) above ALIGNHD(R) and ALIGNHD(R) allows candidate (a) to be selected as the winner. Candidate (c), which has the regular stress pattern is eliminated by ALIGNHD(L).

		*CLASH	FTBIN	ALIGNHD (Φ_{HD}) (L)	WSP	FTYPE (TROCH)	PARSE SYL	ALIGN HD(L)	ALIGN FT(L)	ALIGN HD(R)	ALIGN FT(R)
☞	a. ('kumi)na						*			*	*
	b. ('ku)mina		*!				**				
	c. ku ('mina)						*	*!	*		
	d. ('kumi)(na)		*!							*	*

Tableau 5.23: ['kumina] 'type of religious dance ceremony'

Tableau 5.24 shows that the 'LL,H words are accounted for in a similar way. In these cases, primary stress is assigned to the initial light syllable in spite of the fact that there is a heavy syllable which is predicted to get primary stress.

		*CLASH	FTBIN	ALIGNHD ($\varphi_{\mu\mu}$) (L)	WSP	FTYPE (TROCH)	PARSE SYL	ALIGN HD(L)	ALIGN FT(L)	ALIGN HD(R)	ALIGN FT(R)
	a.('babi) lan				*!		*			*	*
☞	b.('babi) (lan)									*	*
	c. (babi) ('lan)			**!				**	**		

Tableau 5.24: ['babi,lan] ‘rastafarian term for non-believer or policeman’

The predicted surface form is candidate (b), which has violations only of the lowly ranked ALIGN(R) constraints. Candidate (c) which has the stress pattern predicted for regular cases, is ruled out by ALIGNHD($\varphi_{\mu\mu}$) (L). Thus, except for the ranking ALIGNHD(L) and ALIGNHD(L) above ALIGNHD(R) and ALIGNHD(R), we can predict the correct surface form for these words with a constraint ranking similar to that assumed for words with a regular stress pattern.

The final type of exceptional words I discuss here are ,LL'L words with final syllable stress. This pattern is counter to the predicted pattern of penultimate syllable stress. I assume that in these cases, the words are lexically marked for primary stress on the final syllable. To account for these, the constraint FTBIN, which penalizes degenerate feet, has to be ranked low since a light syllable is in the metrically strong position bearing, main stress (Tableau 5.25).

		FTTYPE (TROCH)	PARSESYL	FTBIN	ALIGNHD(R)
☞	a. [(baga)(bu)]			*	
	b. [(ba)(ga'bu)]	*!		*	
	c. [ba('gab <u>u</u>)]		*!		

Tableau 5.25: [baga'bu] ‘insects, worms’

Candidate (b) is ruled out since it incurs a fatal violation of FTTYPE. Candidate (c) which reflects the regular stress pattern is ruled out in this case due to the crucial ranking of PARSESYL above FTBIN. Candidate (a) is thus selected as optimal.

5.4.3 Section Summary

In the preceding sections, I provided phonological evidence supporting the characterization of the JC word prosodic system in terms of stress. JC forms trochaic feet from right-to-left and assigns primary stress to the heavy syllable nearest the left edge of the word. When there are no heavy syllables, the penultimate syllable is stressed. Secondary stress is predicted to occur on the final heavy syllable of a trisyllabic word syllable but not on a word final light syllable. In quadrasyllabic words, secondary stress is predicted to fall on the initial syllable and primary stress on the penultimate syllable. Secondary is not predicted in bisyllabic words due to the pressure to avoid adjacent stresses.

We also saw that alternate stress patterns could be accounted for by the reranking of constraints as well as constraints specific to lexically marked words. For example, the ranking of PARSESYL above FTBIN forced primary stress assignment on a word final light

syllable in ,LLL words instead of on the penultimate syllable. This reflects the fact that the patterns are lexically marked and need to be accounted for separately.

5.5 Chapter Summary

The data presented in this chapter provided evidence for JC as a language with a weight-sensitive stress system. In the following chapters, I focus on the contrastive uses of stress in JC and pay particular attention to cases where stress distinguishes between contrasting pairs of reduplicated words. The aim is to interpret the prosodic differences in JC reduplicated words in the context of the prosodic system. Since JC has a stressed-based system, this means that the discussion of the prosodic differences between reduplicated words should be expressed in terms of differences in stress. As discussed above, it is possible that the phonological properties of compounds are mirrored in reduplicated words. The main questions are, how is stress manifested in reduplicated words?; what kind of stress differences are there between intensive and distributive reduplication?; are there any similarities between the stress pattern on reduplicated words and compound words?; and, are there any similarities between the stress pattern on reduplicated words and monomorphemic words?

CHAPTER 6

PHONETIC STUDY OF THE PROSODY OF REDUPLICATED WORDS

6.1 Introduction

This chapter presents the results of a phonetic analysis of word-level prosody in Jamaican Creole (JC). The goal is to establish a basis for the proposed stress differences between distributive and intensive reduplicated words in terms of the metrical structure and the associated intonational phonology. In other words, the goal is to determine the organization of strong and weak syllables in these words and how they are associated with given intonations. The hypothesis being tested is that intensive and distributive reduplicated words have different prosodic structures and will therefore be differentiated in their alignment with the F_0 contour. The discussion is based on an instrumental analysis of recorded utterances of 7 native speakers including myself. The target words occur in different intonations including broad-focus statements, yes-no questions and citation form in two different prosodic positions, non-final (prenuclear) and final (nuclear) in a statement or question, as was done for unreduplicated words in chapter 4. The selection of utterance types analysed in this chapter is in keeping with the chapter's descriptive style. The results

of the analyses in this chapter provide a basis for future quantitative analyses of specific aspects of the prosodic system. Earlier, I argued that the alignment of the F_0 pattern is contrastive in JC and can account for differences in prosody when segmental similarity between words would otherwise camouflage the contrast. In this case as well, ambiguity at the segmental level is resolved by reference to higher units of prosody.

In chapters 4 and 5 I reviewed phonetic as well as phonological evidence for characterising JC as a stress-accent language. We saw that JC has a prominence driven stress system in which heavy syllables are stressed. In cases where there are no heavy syllables, stress falls on the penultimate syllable of the word. In addition, we saw that there are no lexically contrastive pitch accent shapes that contribute a fixed shape to the F_0 contour. As demonstrated earlier, lexical contrasts are signaled instead by differences in the alignment of the F_0 contour with the word. I illustrate here that the stress contrast between distributive and intensive reduplications is also a difference in the alignment of the F_0 contour with the word. I argue that distributive reduplications have a single accentable syllable and thus one pitch accent, while intensive reduplications have two accentable syllables and thus two pitch accents. Phonetically, the F_0 contour of both words is a high-low melody which is aligned differently in each word. I analyse this high-low melody as a sequence of a HL pitch accent, the low part of which is anchored to the prosodic head of the word. I also show that the type of stress pattern seen in distributive reduplication is also seen in other words in the language, i.e. monomorphemic words and compounds.

The analysis is based on several recordings of reduplicated words with intensive and distributive meanings²⁴ as shown in Table 6.1.

,yelo'yelo	'scattered yellow'
'yelo'yelo	'very yellow'
,gomr'gomr	'sticky all over'
'gomr'gomr	'very sticky'
,blak'blak	'black all over'
'blak'blak	'very black'
,laŋ'laŋ	'sort of long; longish'
'laŋ'laŋ	'very long'
,luo'luo	'low here and there; sort of low'
'luo'luo	'very low'
,nier'nier	'sort of near'
'nier'nier	'very near'
,griin'griin	'scattered green'
'griin'griin	'very green'

Table 6.1: *Elicited Reduplicated Words used in Analysis*

The chapter is organized as follows. In section 6.2, I examine the F₀ pattern on reduplicated words and make comparisons with non reduplicated words, compounds and narrow focus phrases. In section 6.3, I present a summary of the findings and discuss the implications for the phonological analysis of reduplication in Chapter 7. Section 6.4 is the chapter summary.

²⁴ As discussed in chapter 2, the category distributive in JC includes both the semantic notion of attributive and distributive whereas these are treated separately in other CECs.

6.2 F₀ Pattern of Reduplicated Words

In this section I examine the prosodic properties of intensive and distributive reduplicated words. Earlier, I alluded to a stress contrast between these segmentally identical reduplicated words. In this section, I focus on defining the contrasting metrical structures associated with the different intonational contours for each type of reduplication. As was done for the non-reduplicated words and compounds, we need to find out: (a) *if* the F₀ contours for the two meanings differ in the different prosodic positions and under varying intonation contours; (b) *how* the F₀ contours for the two meanings differ in the different prosodic positions and in the different intonation contours.

6.2.1. Monosyllabic Base Words

The reduplicated words I examined here are formed from monosyllabic words. In some cases the words have a distributive meaning and in other cases they have an intensive meaning, e.g. *gringrin* ‘very green/green all over’. I look at each type in turn.

6.2.1.1. Distributive Reduplication

Recall that in distributive reduplication, the meaning of the reduplicated word has the sense of ‘scattered; all over the place; here and there; occasionally’. For example, *grin* ‘green’ reduplicates as *grin'grin* ‘green all over’. In the example below (Figure 6.1), there is a fall from a high pitch on the first syllable onto the stressed second syllable of the word.

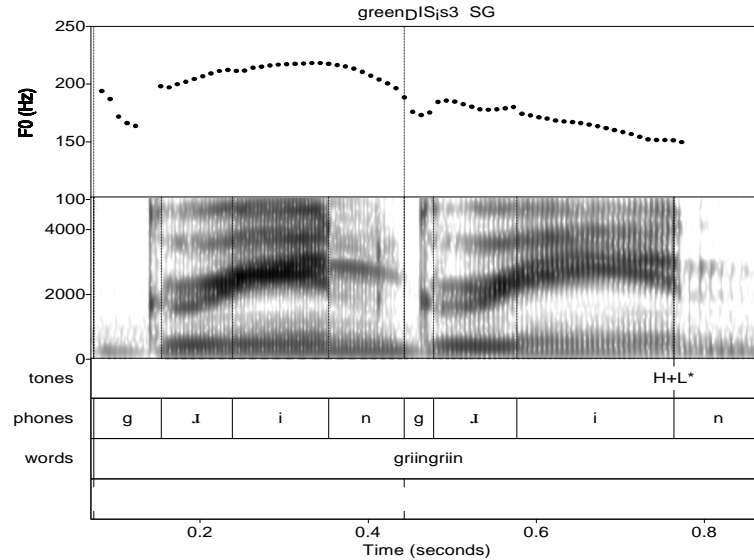


Figure 6.1: Fundamental frequency contour (upper panel) and spectrogram (lower panel) of the reduplicated word *,grin'grin* ‘scattered green’ produced in citation form by speaker SG. This reduplicated word has primary stress on the second syllable.

Based on our observations regarding unreduplicated words in the previous sections, we know this is characteristic of syllables which bear primary stress. I therefore analyse this pattern as a H+L* pitch accent to capture the fact that there is a low tonal target on the stressed second syllable of the word. Notice that this stress pattern is similar to that seen in bisyllabic compound words such as *,biif'biin* ‘type of bean’. Figure 6.2 shows the word in final and non-final position in a statement. In both cases we can still observe the H+L* pitch accent.

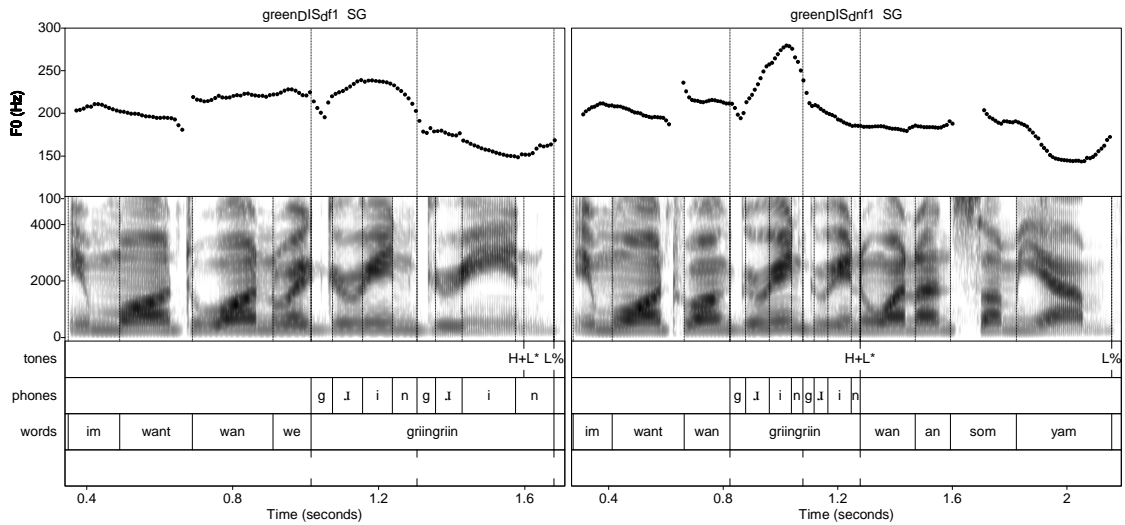


Figure 6.2: Fundamental frequency contours (upper panels) and spectrograms (lower panels) of the reduplicated word *grin'grin* ‘scattered green’ produced in statement intonation in final position in the sentence, *im want wan we grin'grin* ‘He wants one that is scattered green’ (left graph) and in non-final position, in the sentence, *im want wan grin'grin wan an som yam* ‘He wants a scattered green one and some yams’ (right graph).

The next set of examples in Figure 6.3 shows the word *grin'grin* ‘scattered green’ in final and non-final position in a question.

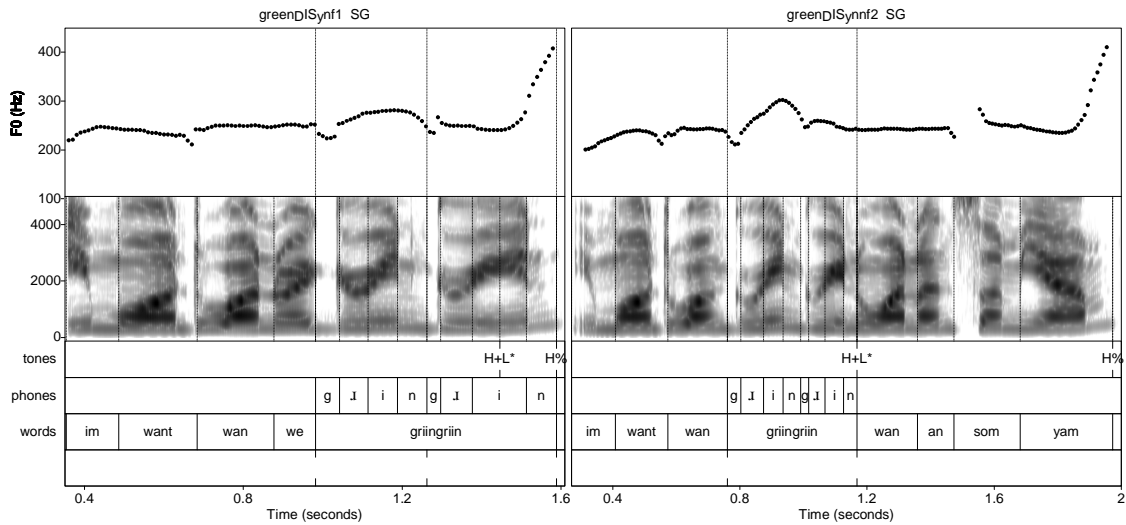


Figure 6.3: Fundamental frequency contours (upper panels) and spectrograms (lower panels) of the reduplicated word *grin'grin* 'scattered green' produced in question intonation in final position in the sentence, *im want wan we griingriin* 'Does he want one that is scattered green?' (left graph) and in non-final position in the question, *im want wan griingriin wan an som yam* 'Does he want a scattered green one and some yams?' (right graph).

This figure shows that the fall on the stressed syllable is still present just before the phrase-final rise to the H% of the question intonation, i.e. a fall-rise pattern. Notice that this is similar to the pattern we saw for compounds and quadrasyllabic words where the H+L* pitch accent was also maintained in all the prosodic contexts considered and also had a fall-rise F_0 pattern in question intonation. I now compare these patterns to those for the intensive reduplication.

6.2.1.2. Intensive Reduplication

In intensive reduplication, the meaning of the reduplicated word has more intensity or emphasis than in the unreduplicated word; for example, *grin* ‘green’ reduplicates as *'grin'grin* ‘very green’. In the example of intensive reduplication shown in Figure 6.4 we can see that there is a kind of ‘hat-like’ F_0 pattern. That is, there is an initial rise to a high on the initial stressed syllable, which is maintained into the second syllable after which the pitch falls to a low on the stressed second syllable. Notice that both the low and the preceding high are both located within the second syllable. I analyse this pattern as a H+L* pitch accent to capture the idea that there is a low tonal target on the stressed second syllable of the word. In addition, I analyse the rise on the initial syllable as a prenuclear rise to a H* pitch accent. (I refer to the accent as prenuclear since it appears before the main pitch accent (H+L*) in the word.) This shows that both stressed syllables in the intensive reduplicated word are accented.

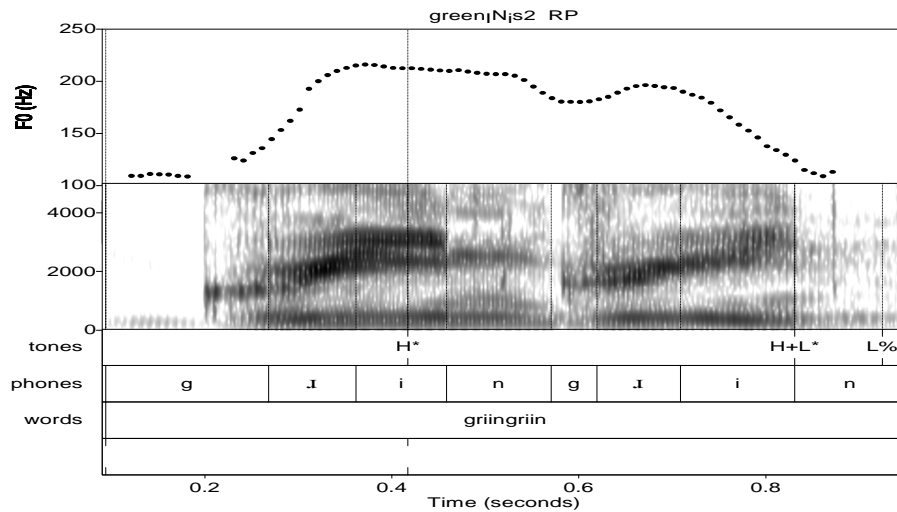


Figure 6.4: Fundamental frequency contour (upper panel) and spectrogram (lower panel) of the reduplicated word *'grin'grin* 'very green' produced in citation form by speaker RP

As we can see in Figure 6.5, this is not the only strategy for producing a contrast with distributives. Speakers can also produce the word with a rise to a high F_0 peak on the first syllable and a fall onto the second syllable. Notice however, that in both Figure 6.4 and Figure 6.5 there is a late fall in pitch on the second syllable. This is crucially different from the distributive reduplications where the fall in pitch on the second syllable is much earlier.

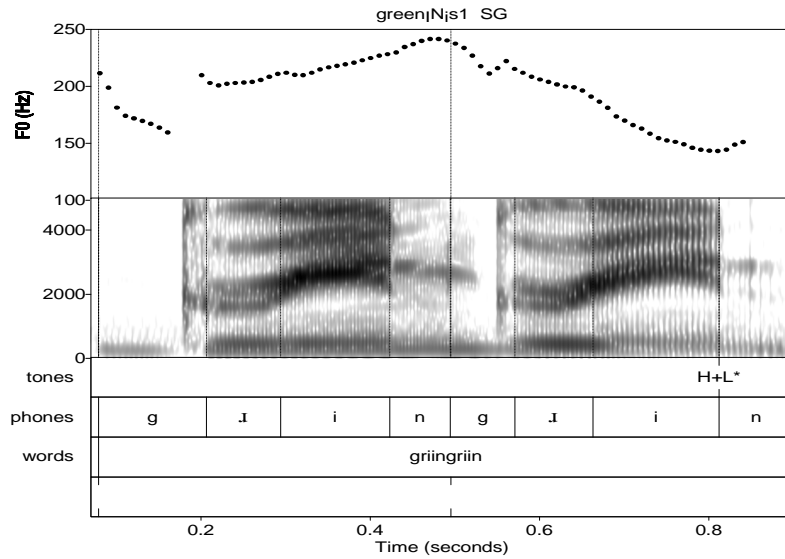


Figure 6.5: Fundamental frequency contour (upper panel) and spectrogram (lower panel) of the reduplicated word '*grin'grin* 'very green' produced in citation form by speaker SG.

Both of these patterns can also be observed in the speech of a single speaker. Figure 6.6 shows the monosyllabic base reduplicated word '*luo'luo* 'very low' produced in citation form by speaker HF. The pitch is slightly higher in the graph on the left than in the one on the right but the location of the pitch peak and fall on the second syllable remains the same for both productions.

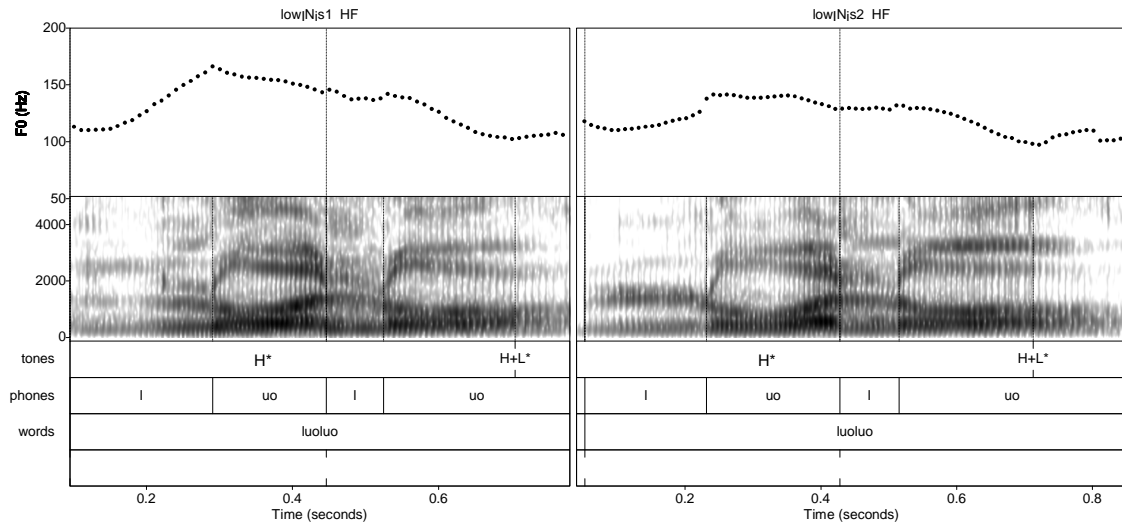


Figure 6.6: Fundamental frequency contours (upper panel) and spectrograms (lower panel) of *luo'luo* produced in citation form with an intensive meaning ‘very low’.

The fact that both the high and low of the H+L* accent are located within the second syllable in these reduplicated words suggests that it is the F₀ fall that is important for locating prominence in these words. This may explain why some speakers produce slight variations in the F₀ pattern associated with the first syllable.

The next set of examples show the intensive word in statement intonation in both final and non-final position.

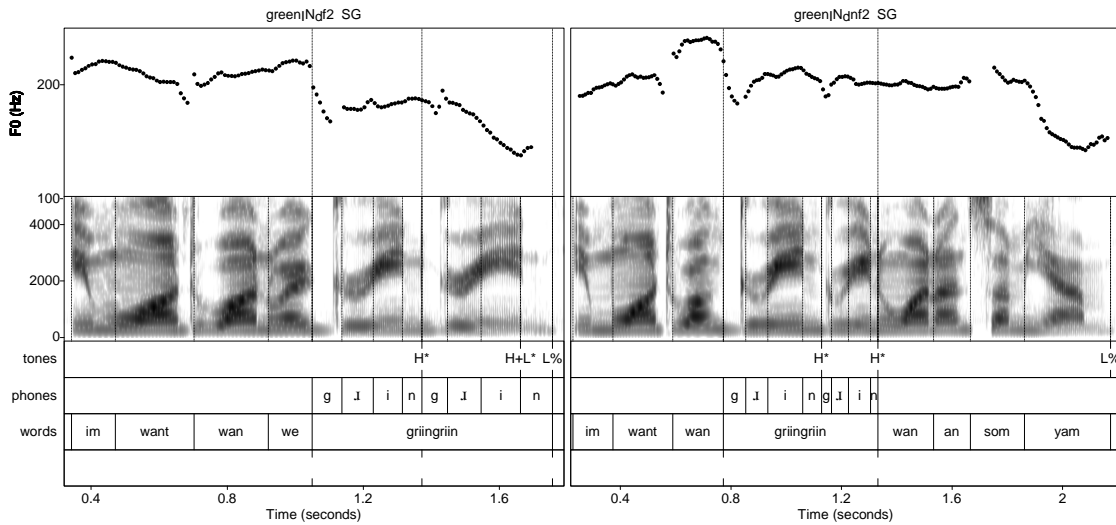


Figure 6.7: Fundamental frequency contours (upper panels) and spectrograms (lower panels) of the reduplicated word *'grin'grin* 'very green' produced in statement intonation in final position in the sentence, *im want wan we grin'grin* 'He wants one that is very green' (left graph) and in non-final position, in the sentence, *im want wan grin'grin wan an som yam* 'He wants a very green one and some yams' (right graph).

In this case we see that the H+L* is maintained in both final and non-final position. Notice though that in the non-final context, the second H+L* accent is realized on the following accented phrase *som yam* 'some yams'.

The examples below in Figure 6.8 show the intensive word in question intonation in both final and non-final position. In this case we see that there is a high pitch throughout the word to the phrase final high of the H% of the question intonation. The fall in pitch onto the stressed syllable is not seen. Rather, we have a high-rise F_0 pattern.

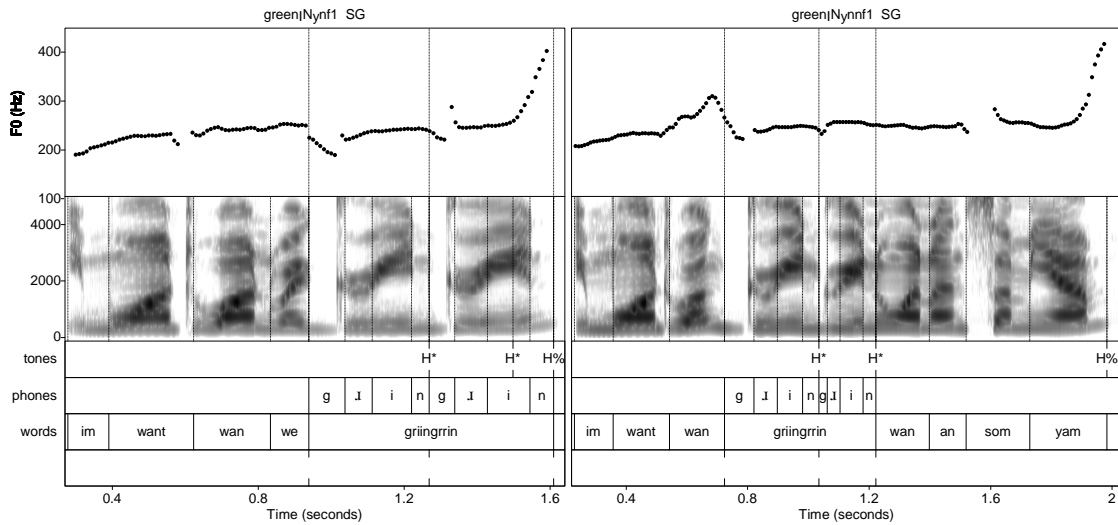


Figure 6.8: Fundamental frequency contours (upper panels) and spectrograms (lower panels) of the reduplicated word *'grin'grin* 'very green' produced in question intonation in final position in the sentence, *im want wan we griingrin* 'Does he want one that is very green?' (left graph) and in non-final position, in the sentence, *im want wan griingrin wan an som yam* 'Does he want a very green one and some yams?' (right graph).

6.2.1.3. Summary

According to the analysis proposed here, the alignment of the H+L* pitch accent in the word accounts for the difference between monosyllabic base intensive and distributive reduplicated words that occur in nuclear position. Figure 6.9 compares a monosyllabic base reduplicated word produced with a distributive meaning (left graph) to one with an intensive meaning (right graph) by speaker EW.

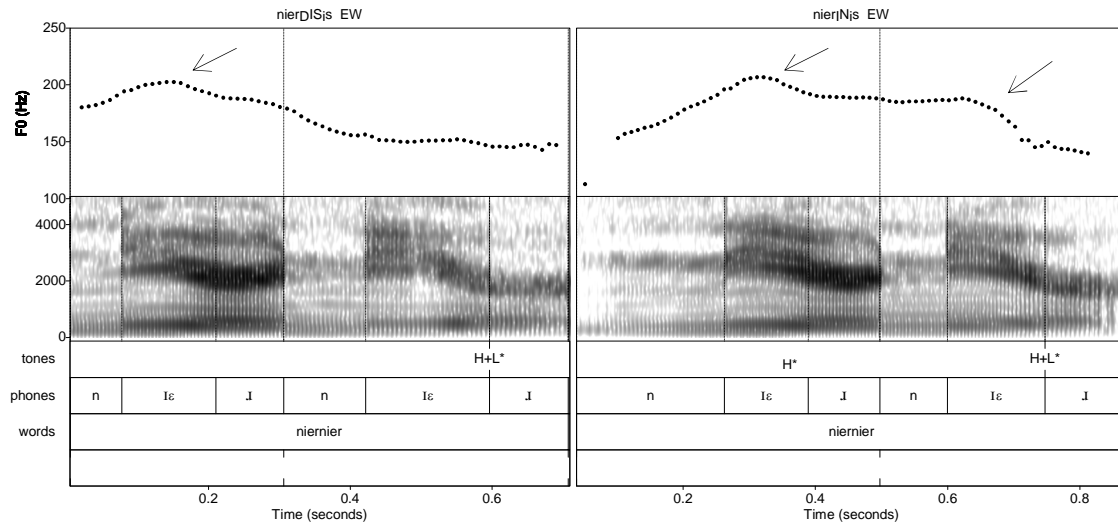


Figure 6.9: Fundamental frequency contours (upper panels) and spectrograms (lower panels) of niernier produced with a distributive meaning ‘not quite near’ (left graph) and with an intensive meaning ‘very near’ (right graph) by EW.

As noted in the previous sections, there is a fall in pitch onto the second syllable of monosyllabic based words in both the distributive and the intensive renditions. We also noted that in the distributive meaning (left graph) the high portion of the F_0 peak is located in the preceding syllable whereas in intensive meaning, both the fall and the high are located within the same syllable. That is, there is an early fall in the word with a distributive reading and a late fall in the word with an intensive meaning. Words with the intensive meaning have two pitch peaks (indicated by the arrows) while words with the distributive meaning have only one. I interpret this as evidence of a prenuclear rise onto the initial stressed syllable of words with an intensive meaning which is crucially absent in words with a distributive meaning. In Table 6.2 I summarize the pitch accent types associated with the stressed syllables in monosyllabic based intensive and distributive reduplication in the different prosodic contexts.

	Prosodic Condition	
	Final	Non-final
Distributive		
Citation	H+L*	
Statement	H+L* (L%)	H+L* (L%)
Yes-No question	H+L* (H%)	H+L* (H%)
Intensive		
Citation	H* H+L*	
Statement	H* H+L*	H+H* (L%)
Yes-No question	H* H*(H%)	H* H* (H%)

Table 6.2: *Summary of Pitch Accents in Intensive and Distributive Monosyllabic based Words*

6.2.2. Bisyllabic Based Words

These reduplicated words are formed from bisyllabic bases. In some cases the words have a distributive meaning and in other cases they have an intensive meaning, for example, *gomr* ‘gummy’ reduplicates as *gomigomr* ‘very gummy/ gummy all over’. In the next few sections, I examine the F_0 contour associated with words of both types. I should also note that although I made reference to the syllable in describing the patterns in monosyllabic based words in section 6.2.1, I will hereafter refer to the patterns on both bisyllabic base words and monosyllabic base words in terms of the *foot*. In the examples discussed in this section, the observed F_0 patterns are identical to those seen in monosyllabic base words, except that they are extended over two syllables. This suggests that the *foot* rather than the syllable is the relevant prosodic category.

6.2.2.1. Distributive Reduplication

In the example in Figure 6.10, we can see a pattern that is identical to that seen in monosyllabic base words but is extended over four syllables instead of two. There is a late fall in pitch onto the second foot such that the F_0 peak is on the first foot of the word. As before, I analyse this as a H+L* pitch accent.

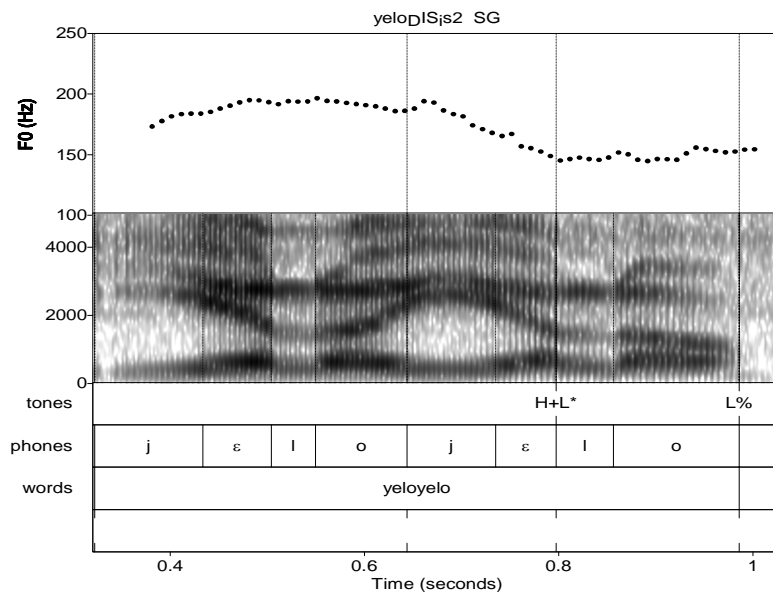


Figure 6.10: Fundamental frequency contour (upper panel) and spectrogram (lower panel) for the reduplicated word *jelo'jelo* 'scattered yellow' (distributive meaning) produced citation.

This pattern is similar to that seen for quadrasyllabic compound words e.g. *beli'uman* 'pregnant woman' (section 4.7.3) and quadrasyllabic monomorphemic words, e.g. *gjalimenta* 'type of wood' (section 4.7.2). Figure 6.11 shows a pitch fall onto the foot

with main stress when the word occurs in final and in non-final position. Thus, in both cases the H+L* pitch accent is still maintained.

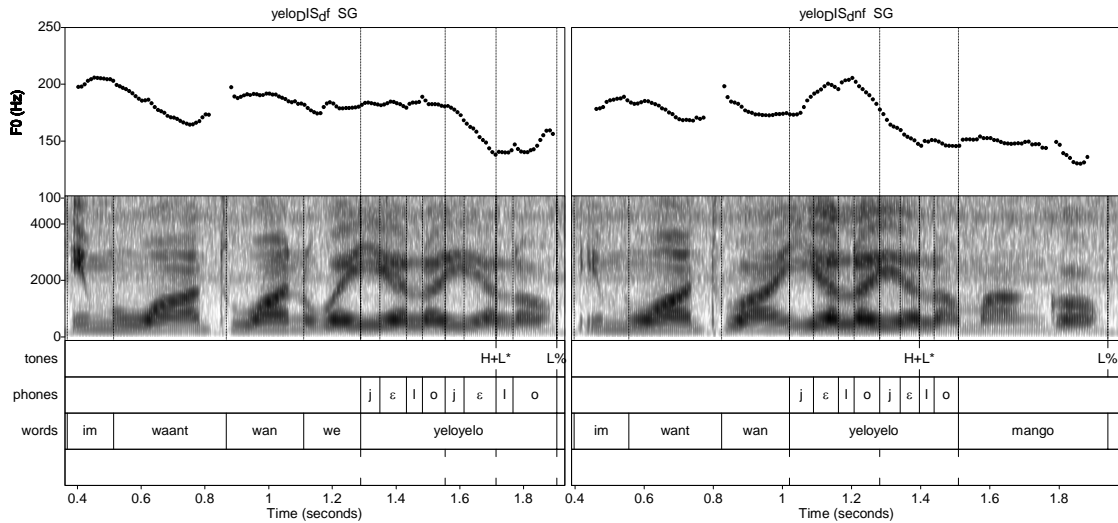


Figure 6.11: Fundamental frequency contours (upper panels) and spectrograms (lower panels) for reduplicated word *jelojelo* ‘scattered yellow’ (distributive meaning) produced in statement intonation in final position in the sentence, *im want wan we yeloyelo* ‘He wants one that is scattered yellow’ (left graph) and in non-final position in the sentence, *im want wan yeloyelo mango* ‘He wants a scattered yellow mango’ (right graph).

Figure 6.12 below shows the word *jelo'jelo* 'scattered yellow' in final and non-final position in a question. As we saw in the previous examples, the H+L* pitch accent is still realized on the word in both contexts.

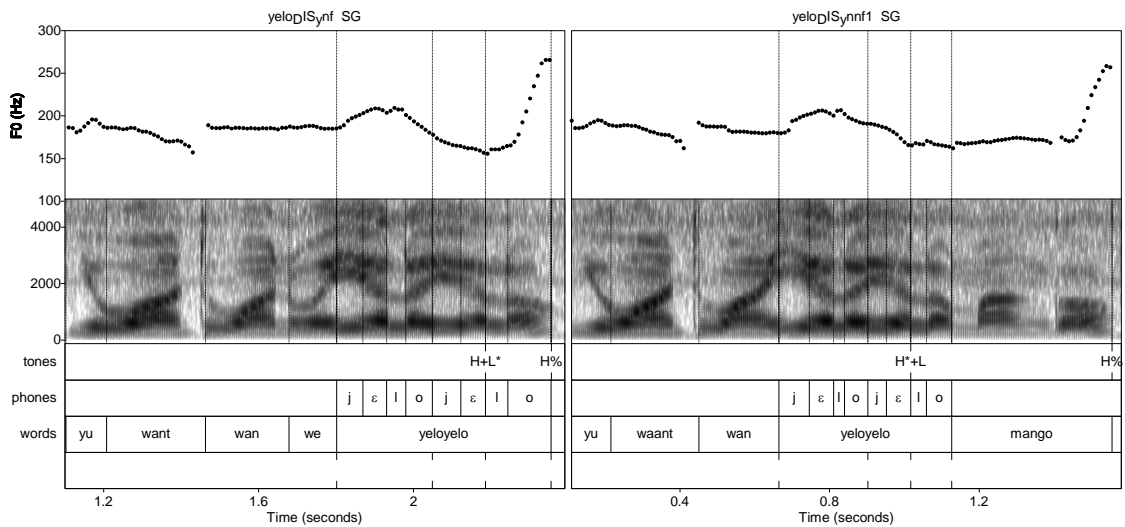


Figure 6.12: Fundamental frequency contours (upper panels) and spectrograms (lower panels) for the reduplicated word *jelo'jelo* 'scattered yellow' (distributive meaning) produced in phrase final position in yes-no question intonation in the phrase *yu waant wan we yeloyelo* 'Do you want one that is scattered yellow?' and in non final phrase position in the question *yu waant wan yeloyelo mango* 'Do you want a scattered yellow mango?'

6.2.2.2. Intensive Reduplication

In this section, I examine reduplicated words with an intensive meaning. As shown in Figure 6.13, there is a prenuclear F_0 rise on the first foot and a late fall in pitch on the second foot which forms the ‘hat-like’ F_0 pattern we saw in monosyllabic base words. As above, this is analysed as a prenuclear H^* pitch accent on the first foot and a $H+L^*$ pitch accent on the second foot of the word.

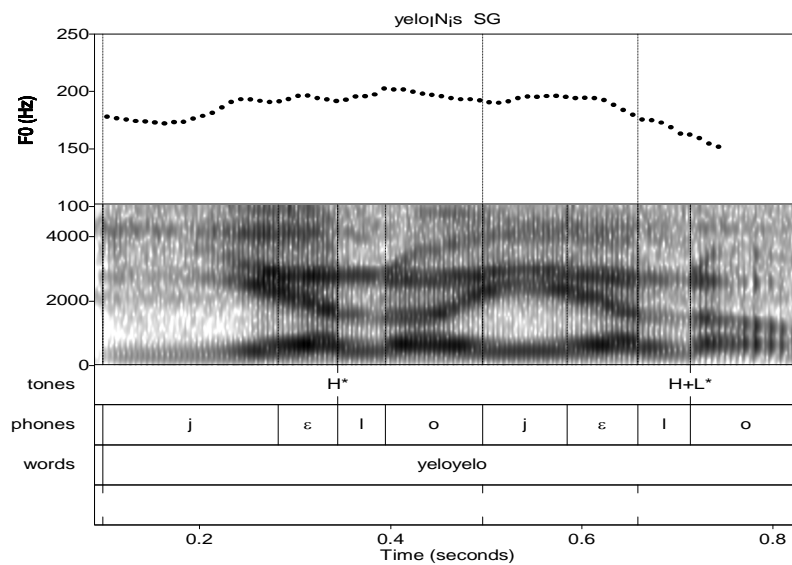


Figure 6.13: Fundamental frequency contour (upper panel) and spectrogram (lower panel) for the reduplicated word *'jelojelo* ‘very yellow’ (intensive meaning) produced in citation.

The next set of examples in Figure 6.14 shows the reduplicated word *'jelojelo* ‘very yellow’ in final and non-final position in a statement. The prenuclear rise onto the first foot and the late fall on the second foot is seen only when the word occurs in final

position (left graph). When the word occurs in non-final position, a high F_0 is maintained throughout the word and the H+L* is realized on the following accented word, *mango*.

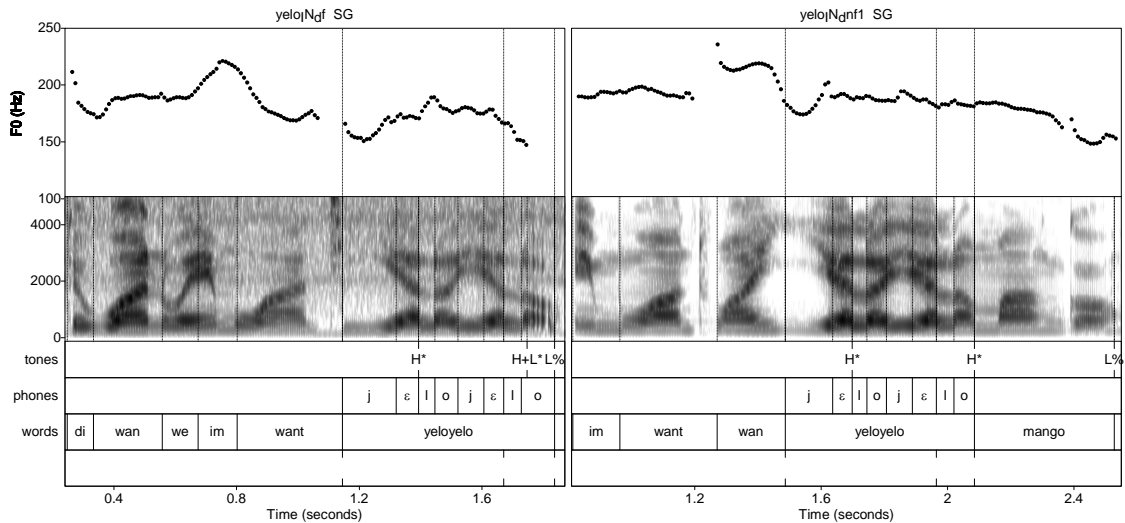


Figure 6.14: Fundamental frequency contours (upper panels) and spectrograms (lower panels) for the reduplicated word *'jelojelo* 'very yellow' (intensive meaning) produced in statement intonation final position in the sentence *Di wan we im want yeloyelo* 'The one he wants is very yellow' (left graph) and in non-final position in the sentence *im want wan yeloyelo mango* 'He wants a very yellow mango' (right graph).

In Figure 6.15, the reduplicated words are in final and non-final position in a question. In both cases, there is a high rise to the terminal contour of the question intonation. In this case we have two H* pitch accents, on each foot.

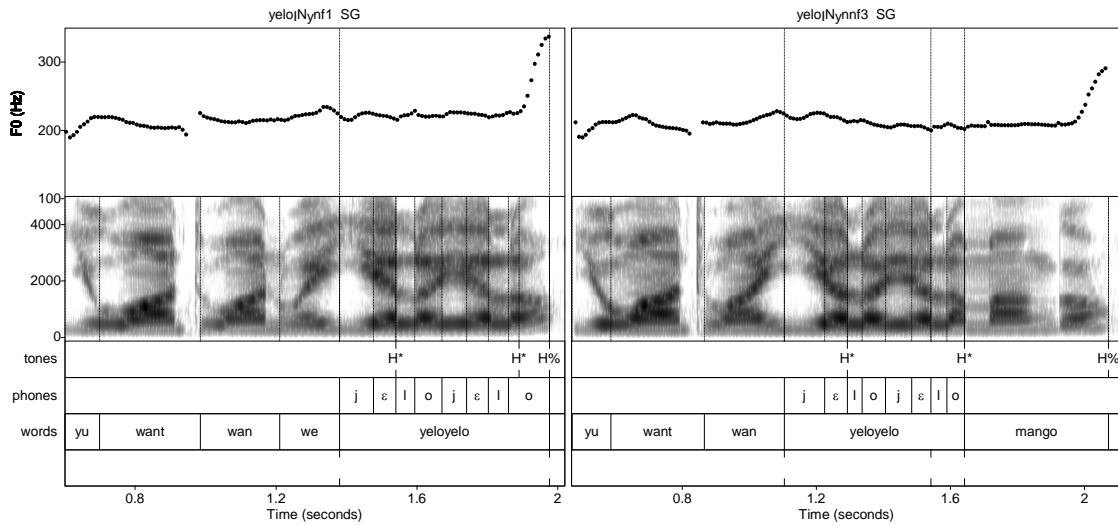


Figure 6.15: Fundamental frequency contours (upper panels) and spectrograms (lower panels) for the reduplicated word *jelojelo* ‘very yellow’ (intensive meaning) produced in question intonation in the sentence final position in the sentence *yu waant wan we yeloyelo* ‘Do you want one that is very yellow?’ (left graph) and in non final position in the sentence *yu waant wan yeloyelo mango* ‘Do you want a very yellow mango?’ (right graph).

6.2.2.3. F₀ Pattern on Narrow Focus Phrases

The data presented in this section are not an exhaustive analysis of phrase types in JC but rather are meant to demonstrate that intensive reduplication patterns with phrases that have two accented syllables, such as the narrow focus phrase types examined here. Figure 6.16 shows the phrase *jelo mango* ‘yellow mango’ in citation form. In this and other examples, the property item ‘yellow’ has narrow focus so that both *yellow* and *mango* are accented²⁵. As was seen for intensive reduplicated words, there is a prenuclear rise on the first foot, a H* pitch accent, and a late fall in pitch on the second foot, a H+L* pitch accent.

²⁵ In the comparable phrase produced with broad focus, there is only a single H+L* pitch accent on the second foot in the phrase.

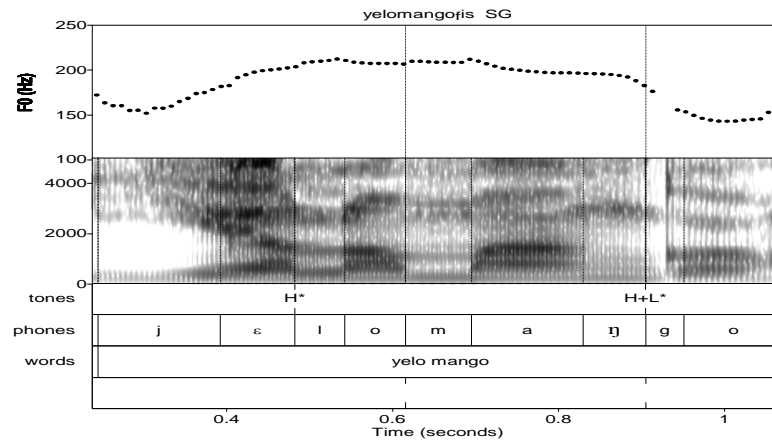


Figure 6.16: Fundamental frequency contour (upper panel) and spectrogram (lower panel) for the phrase *'yelo mango'* 'yellow mango' produced in citation.

Figure 6.17 shows the phrase produced in sentence intonation in final and non-final position. Notice that when the phrase is in non-final position, a high F₀ is generally maintained throughout and the H+L* on the second foot is realized on the following phrase *som yam* 'some yams'.

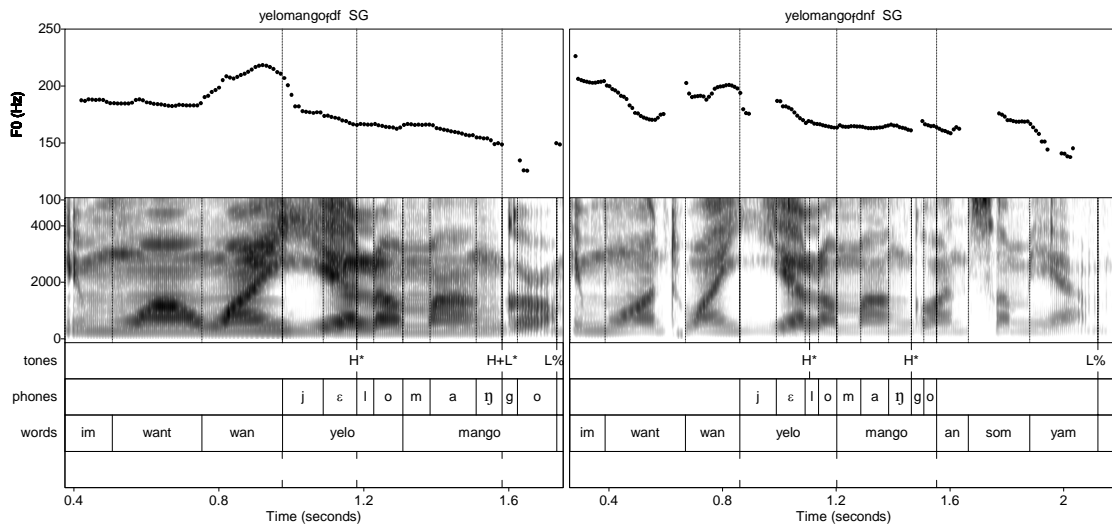


Figure 6.17: Fundamental frequency contours (upper panels) and spectrograms (lower panels) for the phrase *yelo'mango* 'yellow mango' produced in statement intonation in the sentence *im want wan yelo mango* 'He wants a yellow mango' (left graph) and in non-final position in the sentence *im want wan yelo mango an som yam* 'He wants a yellow mango and some yams' (right graph).

Figure 6.18 shows the phrase in final and non-final position in question intonation. In this case, there is a high rise to the high terminal contour as we saw in intensive reduplication and there are two H* pitch accents.

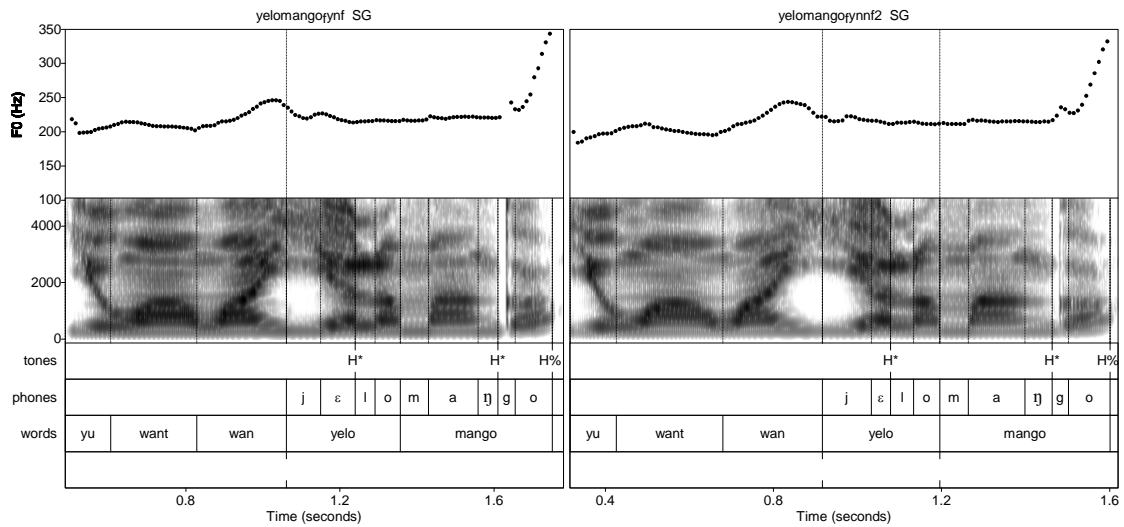


Figure 6.18: Fundamental frequency contours (upper panels) and spectrograms (lower panels) for the phrase *'yelo mango'* 'yellow mango' produced in question intonation in the sentence *yu want wan yelo mango* 'Do you want a yellow mango?' (left graph) and in non-final position in the sentence *yu want wan yelo mango an som yam* 'Do you want a yellow mango and some yams?' (right graph).

6.2.2.4. Summary

As discussed above, I characterize the prosodic difference between bisyllabic base intensive and distributive reduplicated words as a difference in the presence or absence of a prenuclear rise on the initial foot of the word as well as a difference in the location of the F_0 peak of the H+L* pitch accent in each word. Just as in monosyllabic base words, in bisyllabic base words there is a single F_0 peak (indicated by the arrow) in the words with the distributive meaning (left graph) whereas the word with the intensive meaning (right graph) has two peaks (Figure 6.19).

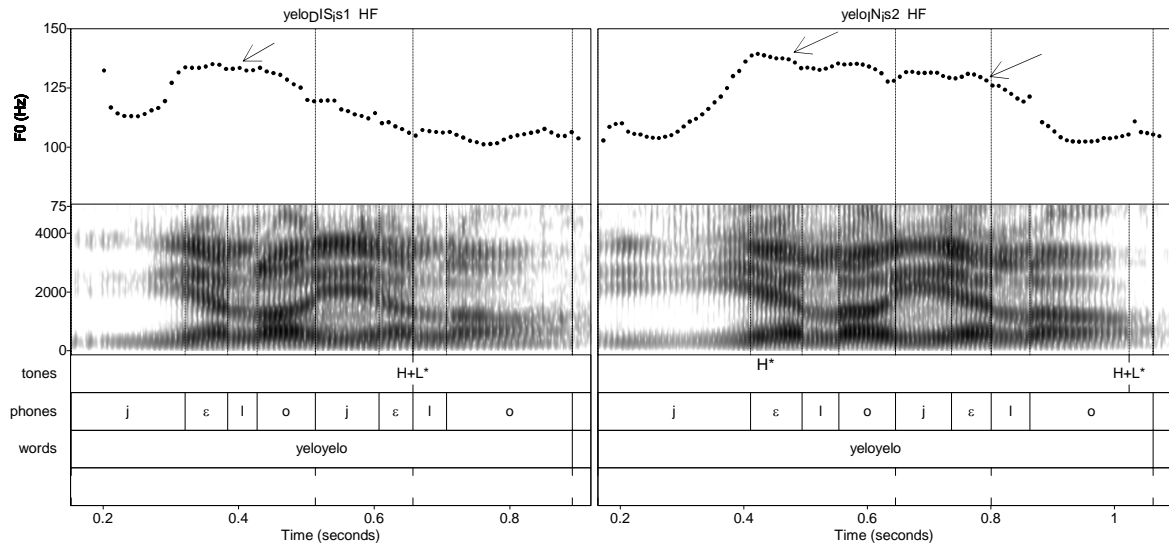


Figure 6.19: Fundamental frequency contours (upper panels) and spectrograms (lower panels) of *yeloyelo* produced in citation with a distributive meaning ‘yellow all over - scattered’ (left graph) and an intensive meaning ‘very yellow’ (right graph) by HF.

Thus, in both bisyllabic-based and monosyllabic-based intensive reduplications, there is a late fall onto the foot that bears main stress (the rightmost foot) such that the F_0 peak and fall are within this syllable. This is similar to the pattern seen for *'mada* ‘mother’ which also had the F_0 peak and fall on the stressed initial syllable (section 4.5.2). In addition, there is a rise in pitch to a F_0 peak on the initial syllable of the word. Given these observations, I propose that intensives have two accentable syllables, the first of which is a prenuclear rise to a H^* tonal accent and the second is the target of a $H+L^*$ pitch accent. This analysis is supported by the narrow focus data in section 6.2.2.3 which show patterns similar to intensive reduplication. Unlike intensives, in distributive words there is an early fall onto the foot that bears main stress (the rightmost foot) and

consequently the F₀ peak is on the preceding foot. Distributives also have a H+L* but there is only a single accentable syllable onto which the pitch falls consistently.

Table 6.3 summarizes the pitch accent associated with the stressed syllables in bisyllabic based intensive and distributive reduplication in the different prosodic contexts.

	Prosodic Condition	
	Final	Non-final
Distributive		
Citation	H+L*	
Statement	H+L* (L%)	H+L* (L%)
Yes-No question	H+L* (H%)	H+L* (H%)
Intensive		
Citation	H* H+L*	
Statement	H* H+L*	H* H* (L%)
Yes-No question	H* H*(H%)	H* H* (H%)

Table 6.3: *Summary of Pitch Accents in Intensive and Distributive Bisyllabic based Words*

The strategies for producing the contrast between intensive and distributive reduplications discussed here are generally consistent with the data produced by other speakers. Representative examples of both types of words in the different prosodic contexts produced by different speakers are given in Appendix B.

6.3. Discussion

As discussed in chapter 4, the alignment of the tonal melody accounts for the contrast in words in JC. The reduplication data discussed here can also be accounted for with reference to the alignment of the F_0 contour with the word. In distributive words, the low of the HL melody corresponds to an early fall in pitch on the foot that had main stress (head foot) whereas in intensive words there was a late fall in pitch on the foot with main stress. In addition, we saw evidence for a prenuclear accent on the first foot which is absent in words with a distributive meaning.

Since intensive reduplications have two accentable syllables, when they occur in citation form and finally in a statement (nuclear position) the nuclear H+L* accent is realized on the foot with main stress and the prenuclear H* accent is realized on the first foot. Distributives reduplications, on the other hand, have only one accentable syllable so when they occur in comparable contexts they take the nuclear H+L* pitch accent on the foot with main stress. The reason for this is directly related to differences in the prosodic structure of the words as is illustrated in the diagrams in (100) through (102) below. That is, distributives pattern like a single prosodic word while intensives pattern like two prosodic words. These diagrams show metrical grid representations of distributive and intensive reduplication. For comparison, I have also included the metrical grids for a quadrasyllabic monomorphemic word, a quadrasyllabic compound and a narrow focus phrase.

(101)		x	PPh		x	PPh	
		x x	Prwd	accented	x x	Prwd	accented
Intensive		x x	Foot	stressed	x x	Foot	stressed
		x x	Syllable		x x x x	Syllable	
	gringrin		'very green'		jelojelo		'very yellow'
(102)		x	PPh				
Adjectival Phrase		x x	Prwd	accented			
		x x	Foot	stressed			
		x x x x	Syllable				
	jelo mango		'yellow mango'				

This distinction in the potential to bear two versus one pitch accent is reminiscent of the distinction in English between compound words like *paperclip* or *blackbird* which are both accented on the first foot, and sequences of two words like *paper tiger* and *black bird* which have two accents, one on each foot. The former has been referred to in the literature as a compound and the latter as a phrasal compound (Bauer, 1983; Nespor and Vogel, 1986; Vogel and Raimy, 2002).

Further, we saw that the pitch accent on distributives is not affected by the question intonation as it was for the intensive forms. The H+L* pitch accent is maintained in all contexts for the distributives, while it appears only in citation form and statement intonation for intensives. More specifically, there is a distinction between a rise from a high in the intensive words and a fall-rise pattern in the distributive words.

Since both intensive and distributive reduplicated words have a pitch fall onto the foot with main stress (head foot of the word), in this respect, they both pattern like compound words in that they have right-headed prominences. However, distributive reduplications are more similar to compound words than are intensive reduplications. In compound words, as in distributive reduplications, there is only one accented syllable. In

neither case do we see the prenuclear accent in these words that is observable in words with an intensive meaning.

6.4. Chapter Summary

This chapter presented phonetic evidence for the metrical stress contrast between intensive and distributive reduplications. We saw that while both types of reduplication bear a similar propensity for stress they are differentiated by their potential to bear multiple pitch accents. In the following chapter, I present a formal phonological analysis of reduplication. The difference in the formal analysis of the words allows us to capture the proposed differences in their prosodic structures.

CHAPTER 7

AN OPTIMALITY THEORETIC ACCOUNT OF JC REDUPLICATION

7.1 Introduction

This chapter presents a formal phonological analysis of four different patterns of reduplication in JC: i.e. iterative, characteristic, distributive and intensive. Particular attention is paid to the prosodic properties of distributive and intensive (simple input) reduplications. These reduplications yield output forms that are segmentally identical, yet, as shown in the previous chapter, have different prosodic properties. I argue that distributive reduplication patterns like a *phonological word* with respect to its prosodic properties, while intensive reduplication does not. I show that this distinction permits different distributions of pitch accents which then accounts for the contrast between the two types of reduplication. Further, I show that both full and partial reduplication are prosodically constrained; when the prosodic requirements are not met, no reduplication is observed. For example, in iterative reduplication the reduplicant copies the base completely (the base is identical to the input) e.g. *dʒukop* ‘to pierce’ → *dʒukopdʒukop* ‘to

pierce repeatedly’. However, if the base is too large, there is no reduplication, e.g. **tfambaoptfambaop*.

The chapter is outlined as follows. In the first three sections I present data and analyses for processes of reduplication in which a prosodic contrast is not involved: section 7.2 focuses on iterative reduplication; section 7.3 on characteristic type reduplication and section 7.4 on intensive (complex input) reduplication. In section 7.5, I present data and analyses of distributive and intensive (simple input) reduplication which were shown to be prosodically contrastive.

7.2 Iterative Reduplication

As discussed in Chapter 2, the input to iterative reduplication may be a complex stem comprised of a root and an affix, e.g. *maak + op* ‘to mark on (deliberately)’ or a simple stem comprised of a bare root, e.g. *tiif* ‘to steal’. In reduplication, the entire stem is copied, as shown in (103). As can be seen in (103c), e.g. *njakaop* ‘to cut crudely’, when the stem is longer than two syllables, no reduplication occurs.

(103) Root +suffix = Stem		Reduplicated Form	
(a) b ^h o ^h odop	‘to seal with boards’	b ^h o ^h odopb ^h o ^h odop	‘to seal with boards repeatedly’
pitop	‘to spit on’	pitoppitop	‘to spit on repeatedly’
maakop	‘to mark on’	maakopmaakop	‘to mark on repeatedly’
njam ^h out	‘to eat some of’	njam ^h outnjam ^h out	‘to eat some of repeatedly’
(b) kot	‘to cut’	kotkot	‘to cut repeatedly’
tiif	‘to steal’	tiiftiif	‘to steal repeatedly’
d ₃ uk	‘to pierce’	d ₃ ukd ₃ uk	‘to pierce repeatedly’

rob	‘to rub’	robrob	‘to rub repeatedly’
(c) tʃambaop	‘to cut/chop coarsely’	*	
njakaop	‘to cut/chop crudely’	*	
kjata ^o ut	‘to scatter (deliberately)’	*	

As was noted, while some forms freely undergo reduplication as in (90a) and (90b), other forms like those in (103c) are not reduplicated, e.g. **njakaopnjakaop** ‘to cut/chop crudely repeatedly’. While this process is a case of full reduplication in the sense that all of the segments of the base are copied in the reduplicant, these data suggest that the size of the base is important in iterative reduplication. In every case where reduplication is observed, the stem is either bisyllabic as in (103a) or monosyllabic as in (103b). It is trisyllabic in those cases where there is no reduplication. The process can therefore be said to be prosodically restricted since no reduplication is observed when the stems are too large. The generalization is that the reduplicant cannot be larger than two syllables. I will first focus on the analysis of forms with reduplication and then return to the cases where no reduplication is observed.

The constraints given in (104) formalize the observation that the reduplicant (the copied material) copies the entire base (the material available for copy).

- (104) Maximize Base-Reduplicant (MAXBR): Every element of the base has a correspondent in the reduplicant (McCarthy and Prince, 1995b).

As shown in Tableau 7.1, candidates that copy less material incur violations of this constraint. For clarity, in this and subsequent tableaux each part of the word is subscripted with an *R* for reduplicant and a *B* for base. In addition, I assume that a reduplicative morpheme, RED, is associated with specific reduplication processes and as such I include a subscript on each reduplicative morpheme to identify the specific process. In this case, the reduplicative morpheme is RED_[ITER]. I also assume that the reduplicant is prefixed to the base though this is not crucial to the analysis.

	/RED _[ITER] + pitop/	MAXBR
☞	a. pitop _R pitop _B	
	b. pitop _R pitop _B	p!
	c. p _R pitop _B	t,o,p!

Tableau 7.1: [pitoppitop] ‘to spit on repeatedly’

The candidate that wins is the one in which all of the segments in the base are also copied to the reduplicant, candidate (a). Candidate (b) fails to copy one segment (p) and incurs one violation of MAXBR; candidate (c) fails to copy three segments (t, o, p), incurring three violations. Both of these candidates are ruled out as possible surface forms in lieu of candidate (a).

Iterative reduplications with complex stems are evaluated in a similar way as illustrated in Tableau 7.2 with the word *maakopmaakop* ‘to mark repeatedly’.

	/RED _[ITER] + maakop/	MAXBR
☞	a. maakop _R maakop _B	
	b. maak _R maakop _B	o, p!
	c. maa _R maakop _B	k, o, p!

Tableau 7.2: [maakopmaakop] ‘to mark repeatedly’

In the case of words with complex stems, as in words with simple stems, the reduplicant copies the entire base, anything less is unacceptable. The MAXBR constraint thus accounts for iterative reduplicated words with simple stems like *kot* ‘to cut’ → *kotkot* ‘to cut repeatedly’ as well as those with complex stems like *dzukop* ‘to pierce (deliberately)’ → *dzukopdzukop* ‘to pierce repeatedly’.

Though the reduplicants in the former case are either monosyllabic or bisyllabic they share the property of being a prosodic foot. The constraint in (105) formalizes this observation.

(105) Reduplicant=Foot (RED_[ITER]=FT): The iterative reduplicant is exactly one foot.

The constraint RED=FT requires that the size of the iterative reduplicant is a foot. As the constraint is formulated, it allows for feet to be bimoraic as in (kot)_{FT} *kot* ‘to cut repeatedly’ or bisyllabic as in (d3u.kop)_{FT} *dzukop* ‘to pierce repeatedly’. The important thing is that in both cases the reduplicant is exactly one foot.

Tableau 7.3 illustrates that the correct surface form is still predicted for words in (103a) and (103b), if we assume the constraint RED_[ITER]=FT. I illustrate with *pitoppitop*

‘to spit repeatedly’. I assume that the actual surface form of both the base and the reduplicant will have prosodic structure. However, for simplicity I mark foot constituency only on the reduplicant with parentheses.

	/RED _[ITER] + pitop/	MAXBR	RED _[ITER] =FT
☞	a. (pit.op) _R pitop _B		
	b. (pit) _R pitop _B	**!	
	c. (pl.to) _R pitop _B	*!	
	d. pl.top _R .pl.top _B		*

Tableau 7.3: [pitoppitop] ‘to spit on repeatedly’

The optimal candidate in (a) is selected since it incurs no violations of the constraints MAXBR or RED=FT. The reduplicant in candidate (b) does not copy two of the segments seen in the base and as such incurs two violations of MAXBR which rules it out. The reduplicant in candidate (c) fares better than candidate (b) but still copies too little of the base; thus it has a fatal violation of MAXBR and is ruled out. The final candidate in (d) does not have foot structure and as such fails on RED=FT.

The constraint in (106) militates against reduplicants which are not binary feet.

(106) Foot Binariness (FTBIN): Feet are binary under a moraic or syllabic analysis

(Prince and Smolensky, 1993; McCarthy and Prince, 1986, 1993).

The constraint FTBIN requires that prosodic feet are well-formed. It can be satisfied with reference to syllables or moras, so feet can either be bisyllabic or bimoraic. As illustrated

in Tableau 7.4, both candidates completely copy the base and satisfy RED=FT. However, candidate (b) is ruled out since its reduplicant has a foot (pɪ), which is neither bimoraic, nor bisyllabic.

/RED _[ITER] + pitop/		MAXBR	RED _[ITER] =FT	FTBIN
☞	a. (pɪ.top) _R pitop _B			
	b. (pɪ)(top) _R pitop _B			(pɪ)!

Tableau 7.4: [pitoppitop] ‘to spit on repeatedly’

The importance of FTBIN to the analysis of iterative reduplication is seen when we examine forms like those in (103c) which have no corresponding reduplicated forms. MAXBR and RED_[ITER]=FT are insufficient to account for these forms as they do not explain why reduplication does not occur. As shown in Tableau 7.5, candidate (a) satisfies both MAXBR and RED_[ITER]=FT since its reduplicant copies the entire base and is a foot. However, it is the incorrect surface form since words like these are not reduplicated. This is indicated the symbol ☛. An additional constraint is therefore needed to rule out forms like these.

/RED _[ITER] + njakaop/		MAXBR	RED _[ITER] =FT
☛	a. (nja.ka.op) _R njakaop _B		
	b. (nja.ka)(op) _R njakaop _B		*!
	c. (nja)(ka)(op) _R njakaop _B		**!

Tableau 7.5: [njakaop] ‘to cut/chop crudely’

Tableau 7.6 reevaluates these candidates with the constraint FTBIN. In this case, candidate (a) has a violation of FTBIN because the foot is not binary. Notice that we are still unable to predict the correct output form, that being, no reduplication, since all the other candidates incur fatal violations of the constraints considered. Though candidate (a) is selected as optimal it is not the correct surface form.

/RED _[ITER] + njakaop/	MAXBR	RED _[ITER] =FT	FTBIN
● a. (nja.ka.op) _R njakaop _B			*
b. (nja.ka)(op) _R njakaop _B		*!	
c. (nja)(ka)(op) _R njakaop _B		**!	**

Tableau 7.6: [njakaop] ‘to cut/chop crudely’

I assume that the constraint MPARSE in (107) is operative in the language. MPARSE militates against the potential output of forms such as *njakaop* ‘to cut crudely’, which have no reduplicated form. As I show just below, MPARSE is critical in predicting the correct surface form.

(107) Morphological Parse (MPARSE): Penalise failure to assign morphological structure (Prince & Smolensky, 1993; Poletto, 1998)

Following Prince and Smolensky (1993), I assume that there are no reduplicated outputs of words like *njakaop* ‘to cut crudely’ and others in (103c) because they have no

phonological or morphological structure associated with segments, i.e. they are unparsed. Thus, an unparsed item cannot be interpreted semantically or in terms of higher morphological structure and does not violate any constraint on morphological or phonological well-formedness. Such a candidate is referred to as the *null parse*. Tableau 7.7 shows the correct selection of *njakaop* ‘to cut/chop crudely’.

/RED _[ITER] + njakaop/	MAXBR	FTBIN	RED _[ITER] =FT	MPARSE
a. (nja.ka.op) _R njakaop _B		*!		
b. (nja.ka) _R njakaop _B	**!			
c. (nja)(ka)(op) _R njakaop _B		*!*	*	
☞ d. Ø				*

Tableau 7.7: [njakaop] ‘to cut/chop crudely’

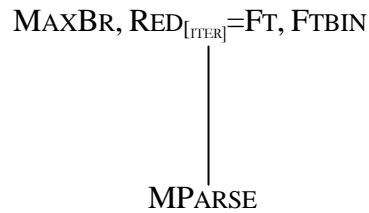
The interaction of MPARSE and FTBIN shown in Tableau 7.7 ensures that the illformed candidate (a) is not predicted as the surface form. Its reduplicant is trisyllabic and therefore exceeds the binary maximum on footing imposed by FTBIN. Thus MPARSE is crucially ranked below FTBIN. Candidate (b) does not copy enough of the base and so incurs a fatal violation of MAXBR and candidate (c) violates FTBIN and RED=FT. The null parse candidate, (d), incurs a violation of MPARSE but is selected as optimal since it satisfies the higher ranked constraints. With MPARSE ranked lowest, a potential reduplicant which would be larger than a binary foot never surfaces. This shows that for words like *njakaop* ‘to cut/chop crudely’, which have no means of satisfying the prosodic requirements for iterative reduplication, the only alternative for a grammatical output is

the *null parse*. Thus, while the iterative reduplicant must copy all of the base, it must do so only if it satisfies the prosodic requirement on size. If the reduplicant would be too large, no reduplication is observed.

7.2.1 Interim Summary

Summarizing the arguments presented above, in iterative reduplication, copying the whole stem is obligatory. However, no reduplication is possible if the requirement for the size of the prosodic feet is not met. This is reflected in the constraint hierarchy for iterative reduplication shown in (108).

(108) *Constraint hierarchy for Iterative Reduplication*



7.3 Characteristic Reduplication

This section examines reduplicated forms which express the characteristic nature of the base form, i.e. having the characteristic of X, where X refers to the semantics of the base (cf. Kouwenberg and LaCharité, 2001). This type of reduplication may also be seen as full reduplication in the sense that the base and the reduplicant are identical, e.g. *naasi* ‘nasty, filthy’ → *naasmaasi* ‘having nasty, filthy characteristics’. However, as shown in (96b), a

segment [ɪ] not seen in the input form is present both in the reduplicant and in the base, e.g. *laaf* ‘to laugh’ → *laafilaafi* ‘inclined to laughter’

Stem		Reduplicated Form	
(109)(a) <i>griɛnɪ</i>	‘grainy	<i>griɛnɪgriɛnɪ</i>	‘having grainy, coarse characteristics’
<i>naasɪ</i>	‘nasty, filthy	<i>naasɪnaasɪ</i>	‘having nasty, filthy characteristics’
(b) <i>laaf</i>	‘to laugh	<i>laafilaafi</i>	‘inclined to laughter’
<i>dʒuk</i>	‘to pierce	<i>dʒukɪdʒukɪ</i>	‘prickly or needle-like’
<i>blak</i>	‘black	<i>blakɪblakɪ</i>	‘having black spots or areas’
<i>bwaɪ</i>	‘boy	<i>bwaɪnbwaɪ</i>	‘characteristically boyish’
(c) <i>lɪzad</i>	‘lizard’	* <i>lɪzadɪlɪzadɪ</i>	
<i>tʃupɪd</i>	‘stupid’	* <i>tʃupɪdɪtʃupɪdɪ</i>	
<i>arɪndʒ</i>	‘orange’	* <i>arɪndʒɪarɪndʒɪ</i>	
(d) <i>pɪkɪnɪ</i>	‘child’	* <i>pɪkɪnɪpɪkɪnɪ</i>	

Notice that all reduplicants are bisyllabic in the words in (109a), in addition, they all have [ɪ] as the final vowel which is also present in the stem. When [ɪ] is not present in the stem as in the words in (109b), the vowel is inserted. When adding the vowel would create a reduplicant which is trisyllabic or longer no reduplication occurs as in (109c) and (109d).

I propose that the vowel is inserted in words in (109b) to satisfy a prosodic requirement that the reduplicant be a bisyllabic foot. In addition, the vowel serves a morphological function of marking adjectives of this type, making them distinct from other adjectives with an intensive meaning (see examples in section 7.5.2) or those with a distributive meaning (section 7.5.1). It is important to note that though bases in which the vowel occurs, like **blakɪ*_{ADJ}, **dʒukɪ*_{ADJ}, are phonologically identical to bases like

grɛni ‘grainy’, they are not free form lexical items in the language²⁶. While it is possible to argue for an intrinsic characteristic interpretation for words like *grɛni* ‘grainy’, this argument cannot be extended to other words in this class.

Tableau 7.8 illustrates the selection of words with [ɪ] in the input form with the constraint MAXBR.

/RED _[CHARAC] + naasi/		MAXBR
☞	a. naasi _R naasi _B	
	b. naas _R naasi _B	*!
	c. naa _R naasi _B	*!*

Tableau 7.8: [naasmaasi] ‘having nasty, filthy characteristics’

The best candidate is candidate (a) which completely copies the base. The other candidates (b) and (c) do not copy all of the segments of the base and as such they incur fatal violations of MAXBR and are ruled out.

Not only is MAXBR completely satisfied in these cases, but the reduplicant must also be bisyllabic. The constraint in (110) formalizes the observation that well-formed reduplicants in (109) are bisyllabic. Input words which are not bisyllabic would therefore have to be augmented to satisfy this constraint.

(110) Reduplicant = Foot (RED_[CHARAC]=FT_[OO]): The characteristic reduplicant is exactly one bisyllabic foot.

²⁶ In other CECs like Guyanese Creole (Devonish, 2003) and Trinidadian Creole (Donald Winford p.c.), these words exist as free forms and can therefore have the ‘characteristic’ interpretation.

Tableau 7.9 shows the selection of *laafilaafi* ‘inclined to laughter’. The reduplicants for all of the candidates shown are exactly one foot. However, the candidates in (b) and (c) have monosyllabic reduplicants and do not copy all the segments in their respective bases. They are ruled out in favor of candidate (a) since it incurs no violations of the constraints considered. It copies the entire base and is a bisyllabic foot.

	/RED _[CHARAC] + laaf/	MAXBR	RED=FT _[oo]
☞	a. (laa.fi) _R laafi _B		
	b. (laaf) _R laafi _B	*!	*
	c. (laa) _R laafi _B	*!*	*

Tableau 7.9: [laafilaafi] ‘inclined to laughter’

As was noted above, the vowel present in the base and the reduplicant in the words in (109b) is not present in the input. These reduplicants are not merely bisyllabic, they are crucially v-final with [ɪ] as the final vowel, a vowel which is copied from the base. The constraint in (111) formalizes this observation.

(111) Align Base Right, [ɪ] (ALIGNBASE_[CHARAC][ɪ]): align the right edge of the base (in characteristic reduplication) with the vowel [ɪ].

The ALIGNBASE_[CHARAC][ɪ] requires the final vowel of the base to be [ɪ]. As noted above, considering MAXBR and ALIGNBASE_[CHARAC][ɪ] together implies that the reduplicant

copies the base. McCarthy and Prince (1993) argue that both base-reduplicant and reduplicant-base copy are predicted by an OT analysis. In this analysis however, there is no crucial evidence that would motivate one approach over the other.

The constraint as formulated forces the appearance of [ɪ] in forms which do not already have it as Tableau 7.10 illustrates.

/RED _[CHARAC] + laaf/	MAXBR	ALIGNBASE _[CHARAC] [ɪ]	RED=FT _[oo]
a. (laa.fi) _R laafi _B			
b. (laaf) _R laaf _B		*!	*

Tableau 7.10: [laafɪlaafi] ‘inclined to laughter’

Candidate (a) is selected as optimal since it inserts a vowel [ɪ] and copies the entire base. The competing candidate (b) does not insert a vowel so it incurs violations of ALIGNBASE_[CHARAC] [ɪ] and RED=FT_[oo] and is ruled out.

Since the bases as well as the reduplicants of these words have the inserted segment, the constraint seen in (112) is important to their evaluation. DEPIO militates against insertion of segments in the base in cases where the input does not have an [ɪ].

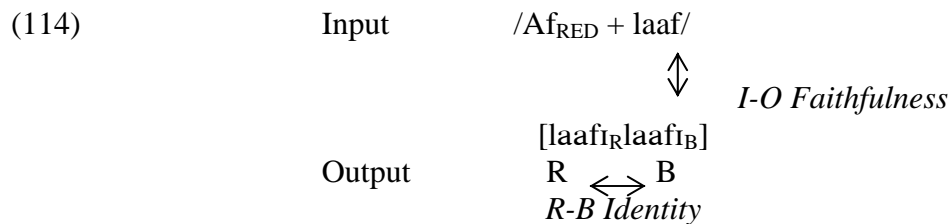
(112) DEPIO: every segment in the output has a correspondent in the input

(McCarthy & Prince, 1995a).

A consequence of segment insertion in the base is that the reduplicant must also insert a segment in order to be completely similar to the base. The constraint in (113) penalizes the insertion of a segment in the reduplicant.

- (113) DEPBR: every segment in the reduplicant has a correspondent in the base
 (McCarthy & Prince, 1995a).

The difference in the relationship between the input and the output on the one hand and the base and the reduplicant on the other, is schematized in (114) with the word *laafi_Rlaafi_B* ‘inclined to laughter’.



With the constraints RED=FT_[σσ], and the DEP constraints, we can predict that the base of characteristic reduplication is no larger than a bisyllabic foot but will be augmented to the appropriate size if it would be too small. As shown, since all reduplicated forms in (96b) have an epenthetic vowel, the DEP constraints must necessarily be ranked low to ensure that these forms are not ruled out (Tableau 7.11).

/RED _[CHARAC] + laaf/		MAXBR	ALIGNBASE [CHARAC][I]	RED=FT _[OO]	DEPBR	DEPIO
☞	a. (laa.fi) _R laafi _B					*
	b. (laa) _R laaf _B	*!	*	*		
	c. (laaf) _R laaf _B		*!	*		
	d. (laaf) _R laafi _B				*!	*

Tableau 7.11: [laafilaafi] ‘inclined to laughter’

Candidate (a) is selected as optimal since its reduplicant is a bisyllabic foot and is identical to the base. Candidate (a) also has the required [I] vowel in both the base and the reduplicant. Since this vowel is not in the input candidate (a) violates DEPIO. The reduplicant in candidate (b) does not copy the entire base and is a monosyllabic foot. It incurs violations of MAXBR, RED=FT and ALIGNBASE_[CHARAC][I] and is ruled out. The reduplicant in candidate (c) is identical to its base but is also ruled out since it is a monosyllabic foot. This tableau also illustrates what happens if the reduplicant does not copy the base. Here, candidate (d) does just that. It is eliminated due to a fatal violation of DEPBR. This shows that DEPIO must be ranked below DEPBR or else we would incorrectly predict candidate (d) as the surface form.

Forms in which the base has the vowel [I] are accounted for trivially as shown in Tableau 7.12.

/RED _[CHARAC] + griɛni/		MAXBR	ALIGNBASE [CHARAC] [I]	RED=FT _[oo]	DEPBR	DEPIO
☞	a. (griɛ.ni) _R griɛni _B					
	b. (griɛn) _R griɛni _B	*!		*		
	c. (griɛ.ni.I) _R griɛni _B			*		*!
	d. (griɛ.ni.I) _R griɛni _B			*	*!	

Tableau 7.12: [*griɛnigriɛni*] ‘having grainy, coarse characteristics’

The candidate in (a) wins since it completely copies its base; it has a bisyllabic reduplicant with the required vowel [I] in final position in the base and the reduplicant. Since the vowel [I] is already in this candidate, it satisfies both DEPBR and DEPIO. This is also the case for candidate (b), it also satisfies both DEP constraints. However, it fails to copy the entire base and has a monosyllabic reduplicant. Consequently, it incurs violations of MAXBR, ALIGNBASE_[CHARAC] [I] and RED=FT and is ruled out. Candidates (c) and (d) both have epenthetic vowels and thus satisfy ALIGNBASE_[CHARAC] [I]. However, candidate (c) violates DEPIO since its base has one more segment than is seen in the input form. Candidate (d) on the other hand, copies its base completely but also has one additional segment not found in the base. It incurs a fatal violation of DEPBR and is ruled out.

Neither the requirement for a bisyllabic foot nor for the occurrence of the vowel [I] is sufficient to account for words like those in (109c), which also have bisyllabic bases. For example, if having a bisyllabic foot were the only requirement we might

expect to find characteristic reduplications of the form **tʃupɪdʃupɪd* but in fact there are no such forms. Tableau 7.13 illustrates this using the same set of constraints as in Tableau 7.9.

/RED _[CHARAC] + tʃupɪd/		MAXBR	ALIGNBASE [CHARAC] [I]	RED=FT _[OO]	DEPBR	DEPIO
●*	a. (tʃu.pɪd) _R tʃupɪd _B		*			
	b. (tʃu.pɪ) _R tʃupɪd _I _B	*!				*
	c. (tʃup) _R tʃupɪd _B	*!*	*	*		

Tableau 7.13: **tʃupɪdʃupɪd*

The illformed candidate (a) is the predicted winner though it has a violation of $ALIGNBASE_{[CHARAC]}[I]$. None of the other candidates are desirable since they make wrong predictions about the surface form. For example, although candidate (b) satisfies $ALIGNBASE_{[CHARAC]}[I]$, it is suboptimal as it does not copy the base completely. As illustrated in Tableau 7.14, the *null parse* plays a critical role in the evaluation of these forms, just as seen in the previous section for iterative reduplication.

/RED _[CHARAC] + tʃupɪd/		MAXBR	ALIGNBASE _[CHARAC] [ɪ]	RED=FT _[OO]	DEPBR	DEPIO	MPARSE
	a. (tʃupɪd) _R tʃupɪd _I _B			*!		*	
	b. (tʃupɪ) _R tʃupɪd _B	*!					
	c. (tʃu.pɪd) _R tʃupɪd _B		*!				
☞	d. Ø						*

Tableau 7.14: *tʃupɪdɪtʃupɪdɪ

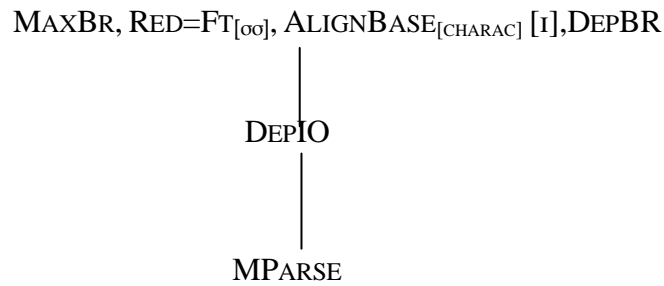
With the constraint MPARSE ranked lowest, reduplicants in which the vowel [ɪ] appears but which do not have a bisyllabic foot, are never selected as optimal. The unparsed candidate (c) is selected as optimal since it does not violate any of the constraints. It is the only option for satisfying all the conditions necessary for an optimal output of characteristic reduplication. I propose that no reduplication is observed for input forms such as this because the input stems are too large (see Kouwenberg and LaCharité, 2001) and Gooden, 2003 for similar observations). The occurrence of the vowel [ɪ] would yield undesirable reduplicants which have trisyllabic rather than bisyllabic feet, e.g. *tʃupɪdɪtʃupɪdɪ or *pɪkɪnɪɪ-pɪkɪnɪɪ.

7.3.1 Interim Summary

The characteristic reduplicant is a bisyllabic foot and must end in the vowel [ɪ] which appears in base. However, if the stem is already bisyllabic and has [ɪ] as a final vowel, the

vowel does not appear. In bisyllabic or trisyllabic stems where the appearance of the vowel would yield a reduplicant that is larger than two syllables, no reduplication is observed. This highlights the crucial relationship of identity which holds between a base and its reduplicant. In these examples, base-reduplicant identity is enforced even when requirements are vital only for the base. These preferences are formally expressed in the constraint hierarchy for characteristic reduplication, shown in (115).

(115) *Constraint hierarchy for Characteristic Reduplication*



7.4 Intensive Reduplication (Complex Input)

The third type of reduplication to be discussed in this chapter is intensive reduplication. As mentioned in Chapter 2, the stems that serve as the input for this type of reduplication can be morphologically simple, comprised of a bare stem, or morphologically complex, comprised of a root plus an affix (stem = root + affix). In this section, I discuss intensive reduplications that are formed from morphologically complex stems. I reserve the discussion of words with morphologically simple stems for section 7.5.2 where I discuss prosodically disambiguated reduplications.

Complex input intensive reduplications contain suffixes like *op*, *aut* or *aaf*, which give the interpretation of an action done intentionally or of an accomplished action (Gooden, 2003). Examples are shown in (116) below.

(116) Stem		Reduplicated Form	
(a) grin-op	‘to grin...’	grin-grinop	‘to smile with someone a lot’
blak-op	‘to make black’	blak-blakop	‘to make very black’
baks-op	‘to hit in the face..’	baks-baksop	‘to hit hard in the face’
âil-op	‘to soil/cover with oil ...’	âil-âilop	‘to soil/cover completely with oil ...’
kriëp-âut	‘to scrape out’	kriëp-kriëpâut	‘to scrape out completely’
brok-âut	‘to break out’	brok-brokâut	‘to break out completely’
kriëp-aaf	‘to scrape off’	kriëp-kriëpaaf	‘to scrape off completely’
njam-aaf	‘to eat completely’	njam-njamaaf	‘to eat completely...’
(b) naasi-op	‘to make filthy ...’	naasi-naasiop	‘to make completely filthy’
plaasta-op	‘to daub/plaster ...’	plaasta-plaastaop	‘to daub/plaster ...’
doti-op	‘to soil ...’	doti-dotrop	‘to soil...’
(c) ariënd3-op	‘to arrange things’	*	
sidoŋ-op	‘to sit upright/sit relaxed for an extended period’	*	
(d) maalihak-op	‘to make a mess / to ruin’	*	
batabruz-op	‘to bruise extensively...’	*	

Where reduplication is observed, the reduplicant is a foot whether monosyllabic as in (116a) or bisyllabic as in (116b). Of interest is the observation that there are no reduplicated forms for the words in (116c) or (116d). This cannot simply be attributed to a general prohibition on copying the affix, since as we saw in section 7.2, stems with these same suffixes undergo iterative reduplication. I will argue here that the illegitimacy of surface reduplicated forms in these words is directly related to the prosodic shape and size of their potential bases. In all of these cases I assume that the base is identical to the root. I motivate this assumption further below. This follows from the observation that the intensive reduplicant maintains identity with the root (stem without suffix) of the input form. For clarity, the proposed root constituency is indicated by brackets [].

For the words seen in (116d), the bases from which the potential reduplicants would copy material are trisyllabic, however intensive reduplicants are maximally bisyllabic. Further, while the surface reduplicants in (116a) and (116b) are exactly one foot, the forms in (116d) would create more than one foot. No reduplication is seen in these forms since the bases are too large. The constraint in (117) captures the generalization that the intensive reduplicant is maximally one foot.

(117) Reduplicant=Foot ($\text{RED}_{[\text{INT}]}=\text{FT}$): the intensive reduplicant is exactly one foot.

Tableau 7.15 shows that the only licit means for an output in these cases is the null parse candidate, in (c), since all the other candidates violate the higher ranked constraints. The reduplicant in candidate (a) has more than one foot and the reduplicant

in candidate (b) does not copy enough of the base. As seen above for iterative reduplication, here there is no reduplication if the base is too large.

/RED _[INT] + maalihakop /		MAXBR	RED _[INT] =FT	MPARSE
	a. (maa.lɪ)(hak) _R [maalihak] _{BOP}		*!	
	b. (maa.lɪ) _R [maalihak] _{BOP}	*!***		
☞	c. Ø			*

Tableau 7.15: *maalihakop* ‘to make a tremendous mess of...’

The behaviour of the forms in (116c) suggest that the RED_[INT]=FT constraint needs to be refined. The bases from which the potential reduplicants would copy material in forms like *sidoŋop* ‘to sit upright/relaxed for a prolonged period’ are exactly one foot and thus satisfy the RED_[INT]=FT constraint. Still, no reduplication occurs in these forms. Interestingly, the forms in (116c) have stems made up of a sequence of LH syllables, that is, they form iambic feet. In all the cases where reduplication is observed, the reduplicant is comprised of a H foot, a LL foot or a HL foot. What is common among all of these forms is that the reduplicant is a trochaic foot. We have independent evidence from stress assignment, which motivated the analysis of JC feet in terms of trochees. The constraint in (118) reflects this observation. Reduplication is not observed in the words in (116c) since this would yield reduplicants with iambic feet.

- (118) Reduplicant=Trochaic Foot (RED_[INT]=FT_[TROCH]): the intensive reduplicant is exactly one trochaic foot (LL, H, HL, L) (cf. Prince, 1990)

Following Prince (1990), I assume that trochaic feet comprised of two light (LL) syllables or a single heavy (H) syllable, are preferable to those comprised of a sequence of a heavy and a light (HL) syllable. These are in turn preferable to one comprised of a single light (L) syllable. In cases where the output form cannot have the correct foot type, the only legitimate output is the null parse as is illustrated in Tableau 7.16.

/RED _[INT] + sidonop/	MAXBR	RED _[INT] =FT _[TROCH]	MPARSE
a. (si.doŋ) _R [sidon] _B op		*!	
b. (si.do) _R [sidon] _B op	*!		
☞ c. Ø			*

Tableau 7.16: *sidonop* ‘to sit upright/relaxed for a prolonged period’

Candidate (a) is completely faithful to the base but it fails on RED_[INT]=FT_[TROCH] since it is an iambic foot (LH). Similarly, candidate (b) is ruled out because it violates the highly ranked MAXBR as it fails to copy all the segments in the base. This leaves only the null parse candidate in (c) which has only a violation of lowly ranked MPARSE since it has no phonological or morphological content.

Tableau 7.17 demonstrates that words with heavy reduplicants as in (116a) are easily accounted for under this analysis.

	/RED _[INT] + baksop/	MAX BR	RED _[INT] =FT _[TROCH]	MPARSE
☞	a. (baks) _R [baks] _B op			
	b. (bak)(sop) _R [baksop] _B		*!	
	c. (baks) _R [baksop] _B	*!*		
	d. Ø			*!

Tableau 7.17: [baksbaksop] ‘to hit hard in the face’

The candidate in (a) with the root as base is selected as optimal since it has no violations of the constraints considered. Candidates (b) and (c) have the base analysed as the stem. Candidate (b) satisfies MAXBR but fails on RED_[INT]=FT_[TROCH] since it has two feet each a heavy syllable. Candidate (c) is phonetically identical to the winning candidate (a) but has the stem as base. It incurs two violations of MAXBR and is ruled out. The MPARSE candidate in (d) is also ruled out.

Reduplicated forms with heavy-light (HL) reduplicants are also correctly selected under this analysis, as illustrated in Tableau 7.18.

	/RED _[INT] + naasiop/	MAXBR	RED _[INT] =FT _[TROCH]	MPARSE
☞	a. (naa.si) _R [naasi] _B op			
	b. (naa) _R [naasi] _B op	*!*		
	c. (naas) _R [naasi] _B op	*!		
	d. (naa.si.op) _R [naasiop] _B		*!	
	e. (naa.si) _R [naasiop] _B	*!*		
	f. Ø			*!

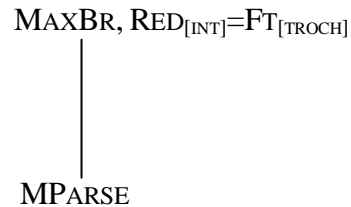
Tableau 7.18:[naasinaasiop] ‘to make completely filthy’

The optimal form, candidate (a), incurs no violations of the constraints considered. Candidates (b) and (c) both have fatal violations of MAXBR as they do not copy all of their bases. The base in candidates (d) and (e) is the entire stem. As in the example above, this is problematic. Candidate (d) copies the entire base, however, this forms a trisyllabic HLH foot causing a fatal violation of RED_[INT]=F_T[TROCH]. Candidate (e) copies less of its base at the expense of fatal violations of MAXBR, which eliminates it. The null parse candidate is eliminated due to its violation of the MPARSE. The evaluation of these candidates illustrates that it is just as important for the reduplicant to copy the base completely, as it is for the base to be a morphological root. In each case, the root is synonymous with the base, all of which must be copied. However, as demonstrated these roots/bases must also be trochaic feet.

7.4.1 Interim Summary

To summarize the discussion and arguments presented above, it has been shown that an intensive reduplicant is a trochaic foot and must copy the entire base. In addition, where the base is too large or is the wrong foot type no reduplication is observed. In these cases we saw that the MPARSE constraint was instrumental in accounting for these forms. I propose therefore that the surface realization of the intensive reduplicant involves *more* than failure to copy the input suffix. The generalization is that the reduplicant copies as much of the base as possible without exceeding the prosodic requirement on foot size or foot form. In (119) I summarize the constraint hierarchy for this subtype of reduplication.

(119) *Constraint hierarchy for Intensive (Complex input) Reduplication*²⁷



7.5 Prosodically Disambiguated Reduplications

In this section, I discuss the two types of reduplication which yield segmentally identical forms i.e. intensives and distributives. The phonetic analysis in the previous chapter showed that these reduplicated words are different phonetically. We saw that when the distributive reduplications occur in citation form or in final position in a statement (nuclear position) they have a H+L* pitch accent on the foot with main stress (head foot). Intensive reduplications, on the other hand, have a H+L* pitch accent on the analogous foot in addition to a H* pitch accent on the preceding foot. Recall that we accounted for the difference between the words as a difference in the alignment of the F₀ peak within the word. The goal is to interpret the phonetic differences within a formal phonological analysis. I focus on the accent pattern on the reduplicated words in citation form and statement final position for two reasons. The alignment difference between intensive and distributive reduplications is most robust in these contexts. In addition, the types of pitch accent that are realized on the words in other prosodic contexts correspond to differences in the shape of the F₀ contours associated with the contexts themselves.

²⁷ An alternate ranking of RED_{[INT]=FT}>>MPARSE>>MAXBR correctly predicts the surface forms for words like *naasmaasaioṗ* ‘to make filthy’ but is unable to account for the absence of surface forms for words like **sidoṗoṗ*. This reinforces the idea that MPARSE must be ranked lowest to account for those cases in which all the conditions for the intensive reduplication cannot be satisfied.

Based on the results of the phonetic analysis, I suggest that the bitonal H+L* in both types of reduplication is associated to the prosodic head of a word, i.e. the main stress in the word. Distributive reduplication patterns like other words in the language such as trisyllabic, quadrasyllabic and compound words and as such can be viewed as a prosodic word. The prosodic word (a phonological unit) in this case is equivalent to a morphological word and has a single pitch accent (H+L*) in citation form. I also assume that the requirement is, all else being equal, only one pitch accent per prosodic word. This is based on the observation that in the general case all non-reduplicated words have at most a single H+L* pitch accent associated with the stressed syllable of the words in the different prosodic contexts in which they were tested. Thus the pattern on distributives reflects the regular pattern observed for non-reduplicated words in the language. Conversely, since intensive reduplications have more than one pitch accent, I propose that they form two prosodic words; they pattern with doubly accented phrases such as the narrow focus constructions seen in section 6.2.2.3.

The data discussed in Chapter 4 showed how the stress patterns on reduplicated words might be accounted for. We saw that main stress is predicted to fall on the leftmost heavy syllable and in the absence of heavy syllables stress falls on the penultimate syllable. Recall that quadrasyllabic monomorphemic words and quadrasyllabic compounds are predicted to have primary stress on the penultimate syllable and secondary stress on the initial syllable. Tableau 4.13 (repeated as Tableau 7.19) illustrates how the stress pattern on quadrasyllabic words is predicted.

		*CLASH	FT BIN	WSP	FTTYPE (TROCH)	PARSE SYL	ALIGN HD(R)	ALIGN FT(R)
☞	a. [(gjalɪ)(mɛnta)]							**
	b. [(gjalɪ) (mɛn)ta]					*!	*	**
	c. [(gja)(lɪmɛn)ta]		*!		*	*	*	***, *
	d. [(gjalɪ)mɛn('ta)]		*!	*		*		**
	e. [(gja,lɪ) ('mɛnta)]	*!			*			**
	f. [(gjalɪ)(mɛnta)]						***!	**

Tableau 7.19: [gjalɪ'mɛnta] 'type of wood'

Candidate (a) wins since it completely satisfies the constraints considered. It has secondary stress on the initial syllable and primary stress on the penultimate syllable. These constraints also accounted for the location of primary stress in bisyllabic words as shown in Tableau 4.14 (repeated as Tableau 7.20).

		*CLASH	FTBIN	WSP	FTTYPE (TROCH)	PARSE SYL	ALIGN HD(R)	ALIGN FT(R)
	a. [(gaa)lɪn]			*		*!	*	*
☞	b. [(gaa)lɪn]			*				
	c. [(gaa)(lɪn)]	*!					*	*
	d. [gaa('lɪn)]			*		*!		

Tableau 7.20: [gaa'lɪn] 'egret'

Note that it is the violation of PARSYL which rules out candidate (d) in favor of candidate (b), which has the predicted stress pattern.

In bisyllabic (monosyllabic-based) distributive and intensive reduplication, main stress falls on the heavy syllable or on the penultimate syllable if they are both light. In

quadrasyllabic (bisyllabic-based) distributive and intensive reduplication, main stress falls on the penultimate syllable and secondary stress falls on the initial syllable. It is with these syllables that the pitch accents are associated. Crucial to this analysis, however, is the observation that different pitch accents are associated with the stressed syllables of the reduplicated words. I account for these differences just below.

7.5.1 Distributive Reduplication

As noted above, the output of distributive reduplication is segmentally identical to that of the intensive reduplications discussed in the previous section. I show here however that distributive reduplication has a different prosodic structure such that it has only one accentable syllable, since there is only one main stress in the word. Representative examples are shown in (120). In these examples, primary stress is assigned to the rightmost foot in the word and secondary stress to the leftmost foot.

(120)	(a)	griɛni	‘grainy’	,griɛni'griɛni	‘grainy all over’
		gomi	‘gummy’	,gomi'gomi	‘gummy all over’
		ogɫi	‘ugly’	,ogɫi'ogɫi	‘ugly all over/in parts’
		jala~jelo	‘yellow’	jelo'jelo	‘yellowish all over’
		haafa	‘halved’	,haafa'haafa	‘in halves’
		pisa	‘spliced’	,pisa'pisa	‘in pieces’
	(b)	blak	‘black’	,blak'blak	‘black spots all over’
		wayt	‘white’	,wayt'wayt	‘whitish all over’
		daag	‘dog’	,daag'daag	‘scattered dogs/many different dogs’

	grin	‘green’	,grin'grin	‘green spots all over/greenish all over’
(c)	blak	‘black’	,blakɪ'blakɪ	‘black spots all over’
	grin	‘green’	,grinɪ'grinɪ	‘green spots all over’
	swit	‘sweet’	,switɪ'switɪ	‘sweet ingredients all over’
	wayt	‘white’	,waytɪ'waytɪ	‘white spots all over’

As shown in these examples, there are two possible output forms for distributive reduplication, either a quadrasyllabic form as seen in (120a) and (120c) or a bisyllabic form as seen in (120b). Notice that the forms in (120a) have bisyllabic inputs while those in (120b) and (120c) have monosyllabic inputs. As was seen for characteristic reduplication, the input forms to distributive reduplication seen in (120c) are augmented to create a bisyllabic base. Unlike characteristic reduplication however, there is an alternative strategy for creating distributive reduplication as is illustrated by the forms in (120b). I argue here that despite the difference in the segmental shape of these words, they share a common prosodic property of bearing a single nuclear pitch accent.

As I show below in Tableau 7.21 and Tableau 7.22, the constraints MAXBR and RED=FT_[TROCH] introduced in the account of intensive reduplications, can also account for shape and size of the distributive reduplicant. This is because the distributive reduplicant is maximally a bisyllabic trochaic foot (LL, HL or H). In essence, any restriction on the size and shape of the intensive reduplicant will also hold for the distributive reduplicant given their segmental similarity.

To illustrate this first consider the selection of the forms in (107a) which have bisyllabic inputs.

	/RED _[DIST] + griɛni/	MAXBR	RED _[DIST] =F _T [TROCH]
☞	a. (griɛ.ni) _R griɛni _B		
	b. (griɛ) _R griɛni _B	*!*	

Tableau 7.21: [griɛniɾgriɛni] ‘grainy all over’

As shown in Tableau 7.21, the optimal candidate is (a) since it copies the entire base and is a trochaic foot. Candidate (a) is thus better than candidate (b) which copies less material from the base. Tableau 7.22 demonstrates that we can account for the size and shape of the words in (120b) in a similar way. In this case as well, the optimal form is the one which copies the base completely. Although candidate (b) has a heavy reduplicant and satisfies RED_[DIST]=F_T[TROCH] it does not copy all of the base. Thus, it incurs a fatal violation of MAXBR and is ruled out.

	/RED _[DIST] + grin/	MAXBR	RED _[DIST] =F _T [TROCH]
☞	a. (grin) _R grin _B		
	b. (gri) _R grin _B	*!	

Tableau 7.22: [gringrin] ‘green all over’

I now move the discussion to the account of alternate shape for words with monosyllabic inputs. Tableau 7.23 illustrates the selection of forms with an epenthetic vowel. As shown in (120c), a segment [ɪ] is present both in the reduplicant and in the base even though it is not seen in the input form. It is apparent that a constraint analogous to the

ALIGNBASE_[I] constraint seen in (111) is needed here in addition to the DEP constraints introduced in (112) and (113). For reference, I repeat these constraints in (121) below.

(121)a. Align Base Right, [I] (ALIGNBASE_{[DIST][I]}): align the right edge the base of a distributive reduplicant with the vowel [I].

b. DEPBR: every segment in the reduplicant has a correspondent in the base

(McCarthy & Prince, 1995a).

c. DEPIO: every segment in the output has a correspondent in the input

(McCarthy & Prince, 1995a).

In this case, candidate (a) is chosen as optimal since it satisfies all of the higher ranked constraints. Candidate (b) is eliminated since it does not copy all of the base and candidate (c) fails on ALIGNBASE_{[DIST][I]} since the vowel [I] is not in the base.

/RED _[DIST] + grin/		MAXBR	RED _[DIST] = FT _[TROCH]	DEPBR	DEPIO	ALIGNBASE [DIST][I]
☞	a. (gri.ni) _R grin _B				*	
	b. (grin) _R grin _B	*!				
	c. (gri.ni) _R grin _B			*!		*

Tableau 7.23: [grinigrini] ‘green all over’

Tableaux 7.22 and 7.23 thus show that distributive reduplicants must remain faithful to their bases, whether or not these bases are monosyllabic or bisyllabic.

Tableau 7.24 shows the selection of surface forms with both monosyllabic and bisyllabic bases. As noted above, the distributive reduplicant may be a bisyllabic foot but need not be. This results in a low ranking of $\text{ALIGNBASE}_{[\text{DIST}][\text{I}]}$. As shown here, since there is no crucial ranking between $\text{ALIGNBASE}_{[\text{DIST}][\text{I}]}$ and DEPIO , both of the possible output candidates (a) and (b) exemplifying the shape and size of the distributive reduplicant are correctly predicted.

/RED _[DIST] + blak/		MAXBR	RED _[DIST] = FT _[TROCH]	DEPBR	DEPIO	ALIGNBASE [DIST][I]
☞	a. (blakI) _R blakI _B				*	
☞	b. (blak) _R blak _B					*
	c. (bla) _R blak _B	*!				*
	d. (blak) _R blakI _B	*!				
	e. (blakI) _R blak _B			*!		*

Tableau 7.24: blakIblakI ‘black all over’

Candidate (a) is selected as optimal since its reduplicant is identical to the base. Notice however, that to achieve this it inserts a segment in the base and the reduplicant at the expense of violating DEPIO . Candidate (b) is also a legitimate surface form for distributive reduplication. It is identical to its base but violates $\text{ALIGNBASE}[\text{I}]$ since it does not have [I] as the final vowel in the reduplicant. The violations incurred by candidates (a) and (b) are not sufficient to eliminate them as these constraints are lowly ranked. Candidates (c) and (d) both fail on MAXBR and candidate (e) fails on DEPBR .

Although we have accounted for the segmental properties of the surface form of distributive reduplication, we must bear in mind that segmental identity between the base and the reduplicant is only part of the requirement, as the accentable syllable also gets a H+L* pitch accent. The constraint given (122) formalizes the observation that the rightmost foot in reduplicated words have a H+L* pitch accent in nuclear position.

(122) ANCHOR: A H+L* pitch accent is anchored to the prosodic head at the right edge of a prosodic word. (ANCHORHL(PRWD))

ANCHORHL(PRWD) defines the location of the nuclear pitch accent on the rightmost accentable syllable in the reduplicated word. I propose that this Anchor constraint is a general constraint in the language. It reflects the observation that all words have a HL melody in citation form and in statement intonation (nuclear position). As discussed earlier, in chapter 6, distributive reduplications pattern with quadrasyllabic non-reduplicated words and compounds since they all have main stress on the rightmost foot in the word. In addition, in all these words there is a single H+L* pitch accent on the stressed syllable of the head-foot of the word, i.e. the foot with main stress. In this way, distributive reduplication behaves like a single prosodic word bearing a single nuclear pitch accent. As I discuss further below (section 7.5.2), in contrast to compound words and distributive reduplications, intensive reduplications have two syllables each capable of bearing a pitch accent.

Tableau 7.25 shows the selection of the monosyllabic base reduplicated word *gringrin* ‘green all over’. The constraints seen in the analysis of stress assignment predict where in the word these syllables with main stress will occur. I have included the constraints ALIGNHD(R) and ALIGNFT(R) here to demonstrate how the location of main stress in the reduplicated word is predicted.

/RED _[DIST] + grin/		ANCHORHL(PRWD)	ALIGNHD(R)	ALIGNFT(R)
	H+L* 			*
☞	a. [(grin) _R (grin) _B]			
	H+L* 	*!	*	*
	b. [(grin) _R (grin) _B]			

Tableau 7.25: [grin'grin] ‘green all over’

In this tableau, the winning candidate (a) has a H+L* pitch accent on the prosodic head of the word and thus satisfies ANCHORHL(PRWD). Candidate (b) has main stress on the

initial syllable and incurs a violation of ALIGNHD. The H+L* pitch accent is also incorrectly assigned to this foot causing a violation of ANCHORHL(PRWD).

In Tableau 7.26 we see the evaluation of a bisyllabic based reduplicated word, *gomigomi* ‘gummy all over’. As with the monosyllabic based word, the optimal candidate, (a), has the H+L* pitch accent on the prosodic head-foot of the word, which in this case is the penultimate syllable. Candidate (b) incurs a fatal violation of AnchorHL

since it makes the wrong prediction about which syllable is accented. It places the nuclear pitch accent the initial foot of the word instead of on the final foot.

/RED _[DIST] + gomi/		ANCHORHL(PRWD)	ALIGN HD(R)	ALIGN FT(R)
☞	$\begin{array}{c} \text{H+L}^* \\ \\ \text{a. } [(\text{gomi})_R (\text{gomi}_B)] \end{array}$			**
	$\begin{array}{c} \text{H+L}^* \\ \\ \text{b. } [(\text{gomi})_R (\text{gomi}_B)] \end{array}$	*!	**	**

Tableau 7.26: [gomi'gomi] ‘gummy all over’

Tableau 7.27 evaluates a bisyllabic based distributive word considering both the constraints on segmental and prosodic well-formedness. For simplicity, I have excluded the align constraints which refer to stress assignment.

/RED _[DIST] + grini/		ANCHOR HL(PRWD)	ALIGNHD(R)	ALIGNFT(R)	MAXBR	RED=FT _[TROCH]	DEPBR	DEPIO	ALIGNBASE [DIST][I]
☞	$\begin{array}{c} \text{H+L}^* \\ \\ \text{a.}[(\text{grini})_R (\text{grini}_B)] \end{array}$			**					
	$\begin{array}{c} \text{H+L}^* \\ \\ \text{b.}[(\text{grini})_R (\text{grini}_B)] \end{array}$	*!	**	**					
	$\begin{array}{c} \text{H+L}^* \\ \\ \text{c.}[(\text{grin})_R (\text{grini}_B)] \end{array}$			**	*!				
	$\begin{array}{c} \text{H+L}^* \\ \\ \text{d.}[(\text{grini})_R (\text{grin}_B)] \end{array}$			**			*!	*	

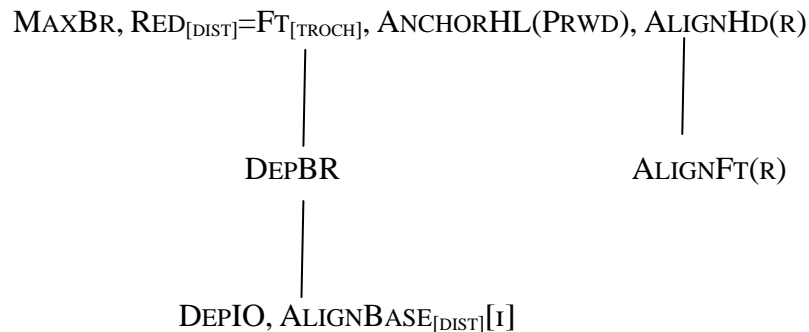
Tableau 7.27: [grini'grini] 'green all over'

As shown here, candidate (a) is chosen as optimal since it best satisfies both the segmental and the prosodic constraints. Candidate (b) has a violation of DEPIO as does the winning candidate. However, candidate (b) is eliminated due to a fatal violation of ANCHORHL. Candidates (c) and (d) satisfy ANCHORHL but incur fatal violations of the constraints MAXBR and DEPBR respectively. This shows that constraints on segmental and prosodic well-formedness are equally important for predicting the correct surface form of distributive reduplication; though some constraints like DEPIO and ALIGNBASE_[DIST][I] are of less importance than others.

7.5.1.1. Interim Summary

The data discussed in this section, shows that the distributive reduplicant is exactly one foot in size. It copies the base completely but must also be correctly accented. Specifically, distributive reduplications have a single H+L* pitch accent on the head-foot of the word. The hierarchy of constraints for distributives is summarized in (123).

(123) *Constraint hierarchy for Distributive Reduplication*



7.5.2 Intensive Reduplication (Simple Input)

In this section I discuss the data for the simple input intensive reduplications. In comparison to the examples seen in section 7.4, which had complex input forms, in this case the entire stem, which is a single morpheme, serves as the base and in each case copy is complete, e.g. *laŋ* ‘long’ → *laŋlaŋ* ‘very long’. In the examples shown in (124), primary stress occurs on the second syllable in the word as well as on the initial syllable. Thus, this type of reduplication has two stressed syllables which can potentially bear pitch accents. This property appears to be restricted to this subtype of intensive reduplication and does not appear to be relevant for intensive reduplications derived from

complex inputs. In all the examples seen below, the reduplicants are trochaic feet, thus the constraint $RED=FT_{[TROCH]}$ introduced in (118) for the evaluation of intensives with complex stems is relevant for these forms as well.

(124)	(a)	blak	‘black’	'blak'blak	‘very black’
		lan	‘long’	'lan'lan	‘very long’
		ful	‘full’	'ful'ful	‘very full’
		l ^h oo	‘low’	'l ^h oo'l ^h oo	‘very low’
		wayt	‘white’	'wayt'wayt	‘very white’
		grin	‘green’	'grin'grin	‘very green’
		swit	‘sweet’	'swit'swit	‘very sweet’
		nier	‘near’	'nier'nier	‘very near’
	(b)	maaga	‘skinny’	'maaga'maaga	‘very skinny’
		grieni	‘rainy’	'grieni'grieni	‘very rainy’
		gomi	‘gummy’	'gomi'gomi	‘very gummy’
		jala~jelo	‘yellow’	'jelo'jelo	‘very yellow’

Tableau 7.28 and Tableau 7.29 illustrate that $MAXBR$ and $RED=FT_{[TROCH]}$ are able to account for the segmental shape of both monosyllabic-based words and bisyllabic-based words. In Tableau 7.28 the optimal form of the monosyllabic-based word is candidate (a) since it copies all the segments of the base. As such it is better than the other candidates in (b) and (c) which copy less material from the base.

/RED _[INT] + laŋ/		MAXBR
☞	a. laŋ _R laŋ _B	
	b. la _R laŋ _B	*!
	c. l _R laŋ _B	*!*

Tableau 7.28: [‘laŋ’laŋ] ‘very long’

For the bisyllabic-based word shown in Tableau 7.29, candidate (a) is chosen as optimal since it satisfies all of the constraints considered. Candidate (b) has a bimoraic reduplicant and satisfies RED=FT. However, not all segments in the base have correspondents in the reduplicant so the candidate incurs a fatal violation of MAXBR and is ruled out. Candidate (c) is also ruled out since its reduplicant does not have any feet.

/RED _[INT] + gomi/		MAXBR	RED _[INT] =FT _[TROCH]
☞	a. (go.mi) _R gomi _B		
	b. (gom) _R gomi _B	*!	
	c. go.mi _R gomi _B		*!

Tableau 7.29: [‘gomi’gomi] ‘very gummy’

However, as noted for distributives, these constraints are insufficient to account for the prosodic facts in this type of intensive reduplication. Specifically, in nuclear position, the rightmost foot of intensive reduplications has a H+L* nuclear pitch accent and the initial foot has a H* prenuclear pitch accent. The data presented in chapter 6 showed that this pattern is identical to that seen in narrow focus phrases. As proposed,

intensive reduplications can thus be analysed as having two prosodic words each with its own pitch accent. As discussed in section 6.3, the presence of the additional grid mark at the level of the prosodic word in intensive words licenses the presence of the prenuclear accent.

Tableau 7.30 illustrates the selection of a monosyllabic-based intensive word, *gringrin* ‘very green’. As before, prosodic word constituency is indicated by square brackets.

	/RED _[INT] + gomi/	ANCHORHL(PRWD)
●*	$\begin{array}{c} \text{H+L}^* \\ \\ \text{a. } [(\text{grin})]_{\text{R}} [(\text{grin})]_{\text{B}} \end{array}$	
	$\begin{array}{c} \text{H+L}^* \\ \\ \text{b. } [(\text{grin})]_{\text{R}} [(\text{grin})]_{\text{B}} \end{array}$	*!
☞	$\begin{array}{cc} \text{H}^* & \text{H+L}^* \\ & \\ \text{c. } [(\text{grin})]_{\text{R}} & [(\text{grin})]_{\text{B}} \end{array}$	

Tableau 7.30: [ˈgrinˈgrin] ‘very green’

Candidate (b) incurs a violation of ANCHORHL because the H+L* pitch accent is on the leftmost foot instead of on the rightmost one, it loses in favor of candidates (a) and (c) which have the accent appropriately anchored to the rightmost foot. However, candidate (c) rather than candidate (a) is the correct output form. As was noted above, there is another property of intensive reduplications that would rule out candidate (a). Namely, a H* pitch accent appears on the initial foot of intensive reduplications as is seen in candidate (c). The constraint given in (125) specifies this.

(125) ANCHOR (H* LF): A H* pitch accent is anchored to the left edge of a phonological phrase in intensive reduplications. (ANCHORH(LF, PPH))

This constraint is specific to intensive reduplications in that it defines the location of the prenuclear pitch accent on the initial foot. As before, the location of the pitch accents themselves is predictable from the stress pattern on the word. According to the Prosodic Hierarchy (section 1.6.2), every instance of the category Prosodic Word (PRWD) is dominated by at least one phonological phrase. This means that the phonological phrase can be seen as the host for both the prenuclear and the nuclear pitch accents. The analysis in terms of the phonological phrase accounts for why the leftmost PRWD in intensive reduplications does not get a nuclear accent. I suggest, that this position is reserved for the first accent in the phonological phrase, a prenuclear accent. In addition, as discussed in section 6.3, since the presence of the additional grid mark at the level of the prosodic word licenses the presence of the prenuclear accent in intensive words, the accent cannot appear in distributives given that they have a different metrical structure.

Tableau 7.31 shows the full evaluation of a monosyllabic-based intensive word.

/RED _[INT] + grin/		ANCHORHL(PRWD)	ANCHORH (LF, PPH)
☞	$\begin{array}{cc} H^* & H+L^* \\ & \\ \text{a. [(grin)]}_R & \text{[(grin)]}_B \end{array}$		
	$\begin{array}{c} H+L^* \\ \\ \text{b. [(grin)]}_R \text{ [(grin)]}_B \end{array}$	*!	*
	$\begin{array}{c} H+L^* \\ \\ \text{c. [(grin)]}_R \text{ [(grin)]}_B \end{array}$		*!
	$\begin{array}{c} H^* \\ \\ \text{d. [(grin)]}_R \text{ [(grin)]}_B \end{array}$	*!	
	$\begin{array}{cc} H+L^* & H^* \\ & \\ \text{e. [(grin)]}_R & \text{[(grin)]}_B \end{array}$	*!	*

Tableau 7.31: [grin'grin] ‘very green’

Candidate (a) wins since it satisfies both of the constraints considered. It has two accented feet, the first of which is assigned a prenuclear H* accent and the second a H+L* accent. The other candidates incur violations of both ANCHORHL and ANCHORH. Candidate (b) has only one accent, a nuclear pitch accent, which is incorrectly anchored in the initial foot, thus it violates ANCHORHL. It also violates ANCHORH since it does not have a prenuclear accent. Candidate (c) likewise has only one accented foot, which is appropriately anchored to the foot with main stress. This is the pattern seen in distributives, but in this case the candidate violates ANCHORH since it does not have a prenuclear accent. Candidate (d) shows that having only a prenuclear accent is prohibited; it fatally violates ANCHORHL. Candidate (e) has both pitch accents but they

are misplaced causing violations of both ANCHORHL and ANCHORH. This shows that a well-formed surface form for intensive reduplication must have both a prenuclear H* pitch accent and a nuclear H+L* pitch accent appropriately associated with the initial and rightmost feet respectively. That is, the left and right edge of the phonological phrase.

Tableau 7.32 shows the selection of a reduplicated word with a bisyllabic-base. The candidate in (a) is the best choice since it satisfies both of the anchor constraints. It has a prenuclear accent on the leftmost foot and a nuclear accent on the rightmost foot. These mark the edges of the phonological phrase. Both candidates (b) and (c) incur fatal violations of the anchor constraints and are ruled out.

/RED _[INT] + gomi/		ANCHORHL(PRWD)	ANCHORH (PPH)						
☞	<table style="margin-left: auto; margin-right: auto; border: none;"> <tr> <td style="text-align: center;">H*</td> <td style="text-align: center;">H+L*</td> </tr> <tr> <td style="text-align: center;"> </td> <td style="text-align: center;"> </td> </tr> <tr> <td style="text-align: center;">a. [(gomi)]_R</td> <td style="text-align: center;">[gomi]_B</td> </tr> </table>	H*	H+L*			a. [(gomi)] _R	[gomi] _B		
H*	H+L*								
a. [(gomi)] _R	[gomi] _B								
	<table style="margin-left: auto; margin-right: auto; border: none;"> <tr> <td style="text-align: center;">H+L*</td> </tr> <tr> <td style="text-align: center;"> </td> </tr> <tr> <td style="text-align: center;">b. [(gomi)]_R</td> </tr> <tr> <td style="text-align: center;">[gomi]_B</td> </tr> </table>	H+L*		b. [(gomi)] _R	[gomi] _B		*!		
H+L*									
b. [(gomi)] _R									
[gomi] _B									
	<table style="margin-left: auto; margin-right: auto; border: none;"> <tr> <td style="text-align: center;">H*</td> </tr> <tr> <td style="text-align: center;"> </td> </tr> <tr> <td style="text-align: center;">c. [(gomi)]_R</td> </tr> <tr> <td style="text-align: center;">[gomi]_B</td> </tr> </table>	H*		c. [(gomi)] _R	[gomi] _B	*!			
H*									
c. [(gomi)] _R									
[gomi] _B									

Tableau 7.32: ['gomi'gomi] 'very gummy'

Tableau 7.33 shows the selection of a bisyllabic based word with the inclusion of the constraints on the segmental shape of the word and its prosodic well-formedness.

/RED _[INT] + gomɪ/		ANCHOR HL(PRWD)	ANCHORH (LF, PPH)	MAXBR	RED _[INT] =F _T [TROCH]
☞	$\begin{array}{cc} H^* & H+L^* \\ & \\ a. [(gomɪ)_R (gomɪ_B)] \end{array}$				
	$\begin{array}{cc} H+L^* & H^* \\ & \\ b. [(gomɪ)_R (gomɪ_B)] \end{array}$	*!	*		
	$\begin{array}{cc} H^* & H+L^* \\ & \\ c. [(gom)_R (gomɪ_B)] \end{array}$			*!	

Tableau 7.33: ['gomɪ'gomɪ] ‘very gummy’

As before, the optimal candidate is the one which satisfies both the segmental constraints and the prosodic constraints, in this case candidate (a). Candidate (b) satisfies both constraints on segmental shape of the output form but fails on the Anchor constraints since the pitch accents are associated incorrectly with the word. Candidate (c) has the appropriate prosodic form, both a prenuclear and nuclear accent but the entire base is not copied. This reinforces the idea that intensive reduplications must equally satisfy conditions on segmental and prosodic well-formedness to produce grammatical surface forms.

7.5.2.1. Interim Summary

In summary, the intensive reduplicant is a prosodic foot. In this subtype of intensives, the reduplicant copies the base completely while adhering to the prosodic requirements on foot structure. Further, it must adhere to other prosodic requirements which permit its

stressed syllables to be accented. That is, it must have two accented syllables in order to be a well-formed output. The hierarchy of constraints is summarized in (126).

(126) *Constraint hierarchy for Intensive (Simple Input) Reduplication*

MAXBR, RED_{[INT]=FT}[TROCH], ANCHORHL(PRWD), ANCHORH (LF, PPH)

7.5.3 Section Summary

The main points discussed in this section are as follows. First, both intensive and distributive reduplications are right prominent, having their nuclear stressed syllables dominated by the rightmost foot in the word. Both are similar to compound words which are also right prominent, having their main stress on the rightmost foot in the word. Second, while both intensive and distributive reduplications involve full reduplications, they crucially satisfy different prosodic requirements to achieve a well-formed output. With respect to their stress patterns, for example, intensive reduplications have two metrically strong (accentable) syllables which each carry a pitch accent in citation form and in statement intonation. Distributive reduplications, on the other hand, have only one metrically strong (accentable) syllable which carries a pitch accent in the same contexts. Third, as noted above, unlike intensives, distributive reduplications pattern with non-reduplicated words in the language such as compounds, quadrasyllabic words and non-

reduplicated words. All of these have a single pitch accent in citation form and in statement intonation. Thus, distributives reflect the regular pattern.

7.6 Previous Accounts of JC Reduplication

In this section, I review two previous phonological analyses of JC reduplication. McCarthy (1983) proposed a segmental analysis of JC reduplication in which the template defining the JC base is as in (127).

(127) Onset V (C(V)) where ‘onset’ is a possible syllable onset in JC

This template is based on data from DeCamp (1974) and so does not cover the range of data examined in this dissertation. Consequently, it does not make the right predictions about the possibilities for reduplicants in JC reduplication. For example, the template incorrectly predicts that coda consonants are prohibited in the syllables of reduplicants. Also, the template predicts that there are no long vowels or diphthongs in reduplicants. To the contrary we have seen several examples with input forms with long vowels e.g. *maaga* ‘skinny’ and diphthongs e.g. *grieni* ‘grainy’. Apart from the empirical issues, a segment based account misses the generalization that in all cases the JC reduplicant is a prosodic foot. Within the OT framework assumed here, the fact that some reduplicants are a bisyllabic foot is predicted by the same constraints as those that predict that other reduplicants can be either a bimoraic or a bisyllabic foot. A segment-based account would require different templates to account for these differences.

Alderete (1993) proposed a syllable-based account of JC reduplication within a prosodic morphology approach. The analysis is also based on data from DeCamp (1974) and so is restricted in the range of data covered. Alderete proposed that the base for JC reduplication is a minimal prosodic word that contains at least one foot, a moraic trochee. That is, the base is a foot comprised of LL syllables or a H syllable. The approach assumes that in HL cases, the final L syllable is unfooted. Alderete's analysis is similar to the one presented here in that phonological conditions on the process are delimited in terms of authentic units of prosody following the assumptions of prosodic morphology (McCarthy and Prince, 1993; McCarthy and Prince, 1995a; McCarthy and Prince, 1995b). However, the analysis presented here does not crucially assume a moraic trochee analysis. Evidence that the moraic trochee analysis is not satisfactory can be taken from the fact that the portion of the word corresponding to the reduplicant is not necessarily a moraic trochee. For example, there are LL reduplicants as in *yelo_Ryelo_B* 'very yellow'; HL reduplicants as in *griɛn_Rgriɛn_B* 'very grainy'; HH reduplicants as in *njamop_Rnjamop_B* 'to eat all of repeatedly'; LH reduplicants as in *blakop_Rblakop_B* 'to blacken repeatedly' and H reduplicants as in *blak_Rblak_Bop* 'to make very black'. Alderete's analysis cannot explain why the LH reduplicant is permissible in words like *blakop_Rblakop_B* 'to blacken repeatedly' but not in words like *blak_Rblak_Bop* 'to make very black' or why HH reduplicants are permissible in words like *njamop_Rnjamop_B* 'to eat all of repeatedly'. As I discuss below, this is directly related to the theoretical treatment of the base in the reduplication process.

The shortcomings of both of these proposals is partly an empirical issue and partly theoretical. First, as I have noted above, the analyses are based on restricted datasets which do not reflect the full range of possibilities for reduplication in JC. Second, from a theoretical perspective, both of these analyses specify conditions on the size and shape of the *input* in JC reduplication whereas this analysis specifies conditions on the *reduplicant* and the *base*. This is a reflection of the theoretical approach taken here that both the base and the reduplicant must satisfy phonological as well as morphological requirements. This was shown to be instrumental in accounting for Characteristic type reduplications (section 7.3) in which a vowel not seen in the input was present both in the base and the reduplicant in the output form. Second, in this approach, the base is not necessarily identical to the input form since the base is the portion of the input from which segmental material is copied. This conceptualization of the base is vital in accounting for differences between iterative reduplication whose base is a stem equivalent to the input and intensive reduplication (complex input) whose base is a root (i.e. the stem minus the affix of the input). Third, neither of the previous approaches considered the role of JC prosody in disambiguating segmentally identical reduplicated words like the intensive and distributive reduplications discussed here.

7.7 Chapter Summary

In this chapter JC reduplication was shown to be systematic and predictable. Four types of reduplication processes were identified based on the semantic ideas expressed by each output form. The discussion of reduplication in terms of prosody was vital to the analysis

presented. In particular, differences between the reduplication processes were shown to be directly related to the type of prosodic restrictions imposed on them. Further, each process has a specific reduplicative morpheme which has separate phonological requirements. I review these differences below.

The first issue has to do with the shape and size of the reduplicant. In all of the cases seen, the JC reduplicant is completely faithful to the base, i.e. MAXBR is always satisfied (full reduplication). However, the input form was not always identical to the reduplicant. In these cases, the size and form of the reduplicant was shown to be prosodically determined. The intensive reduplicant was shown to be a trochaic foot; the characteristic type reduplicant was obligatorily a bisyllabic foot; the iterative and distributive reduplicants could be either a bisyllabic or a bimoraic foot. The generalization is that reduplicants across all the different types of reduplication processes are consistently *a prosodic foot*. However, the phonological shape and form of these feet vary according to the type of reduplication process involved.

The second issue is the location of the reduplicant with respect to the base. In processes of full reduplication, it is not always apparent which portion of the output string is the base and which is the reduplicant. I have assumed that the reduplicant is prefixed to the base since it is not crucial to the analysis and there is no crucial evidence to the contrary.

The third issue concerns the fixed vowel segment /ɪ/ in both the reduplicant and the base of characteristic and some distributive reduplications. While this is obligatory for characteristic type reduplication it is optional for distributive reduplication. The fact

that the quality of the vowel is invariant in these forms is suggestive of a morphological function denoting reduplicated adjectives that can express semantic notions of the characteristic nature of the base form.

Fourth, there were several cases in which the reduplicant could not satisfy the prosodic requirements of its subtype and, as a result, no reduplication was observed. In these cases, the constraint MParse proved crucial to the analysis. In particular, iterative and characteristic type reduplications were blocked when the reduplicant would be larger than two syllables. Intensive Reduplication (complex input) was blocked when the foot type and foot size requirements could not be satisfied.

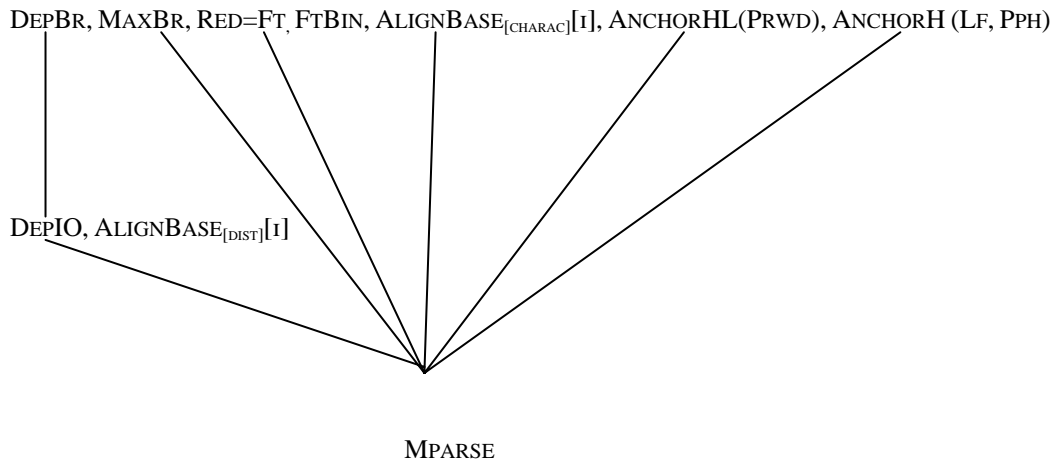
Lastly, the prosodic structure of intensive and distributive reduplication with respect to their stress patterns determined the type and number of pitch accents associated with them. While intensives were doubly accented, distributives were accented only once. Since doubly accenting the reduplicated word was only observed in the intensive reduplication process, this suggests that it may serve a pragmatic function of marking ‘emphasis’ in intensive reduplications. As noted earlier, a similar property was seen in narrow focus constructions. In addition, while distributives pattern with phonological words in the language, while intensives do not.

To summarize, some constraints proposed above are prosodically motivated. These are aimed at forming a preferred foot, whether by failing to copy an affix, restricting the length of the input, augmenting the reduplicant or prohibiting reduplication (see 128). In each case the reduplicants copied as much of the input material as possible without exceeding the prosodic limit. In addition, the constraints specific to the

contrastive intensive and distributive reduplications aimed at forming well formed prosodic units in terms of their rhythmic organization.

A summary of the constraints posited for JC reduplication is given in (128). These constraints are able to account for the range of reduplicated forms in the language. For simplicity, the constraint RED=FT is stated in its general form and constraints related to stress assignment are omitted.

(128) *Summary of Constraints for JC Reduplication.*



CHAPTER 8

CONCLUSION

The research discussed in this dissertation serves to elucidate the phonological and phonetic properties of reduplication processes in Jamaican Creole. I have shown that surface differences in the shape of the reduplicant across different reduplication processes are straightforwardly accounted for by referring to the prosodic properties of the reduplicated words. Further, I have shown that segmental ambiguities between semantically different reduplicated words are resolved at a higher level in the prosodic hierarchy, i.e. the level of the prosodic word. It is hoped that this will lead to comparable research into reduplication processes in other Caribbean English Creoles (CEC) and will thus help us to better understand how the prosodic systems of CECs interact with morphological processes in the languages.

A secondary goal of this dissertation was to situate the word-level prosodic system of JC in a wider taxonomy of prosodic systems, i.e. tonal, stress-accent or non stress-accent. I have shown that the JC has a stress-accent system in which lexical contrasts result from differences in the alignment of the F_0 contour with the stressed syllables of words. The treatment of the JC prosodic system provided the

backdrop against which the proposed prosodic differences between the segmentally identical intensive and distributive reduplications were interpreted.

In Chapter 2 I showed that the processes of reduplication found in Jamaican Creole are also represented in other CECs. However, the semantic types in JC reduplication are a subset of those found in other CECs. In particular, while some CECs have a distinct class of *attributive* reduplication, I suggest that this meaning might be expressed through *distributive* or *characteristic* reduplication in JC. In terms of the size of the copied material, the majority of processes in CECs are processes of full reduplication though some cases of partial reduplication are reported. I discussed data showing that in many instances reduplication created segmentally identical output forms. In these cases CECs manipulated either the stress or the tonal properties of the reduplicated words to signal differences in meaning.

In Chapter 4 I discussed phonetic evidence for a characterization of the JC prosodic system as a stress system. I showed that lexical contrasts in JC are signalled by differences in the alignment of the F_0 contour within the word. This is in contrast to ‘pure’ tonal systems in which we can attribute lexical contrasts to specific F_0 shapes. In particular, I showed that main stress in JC is characterized by a fall in pitch onto that syllable. In addition, the preceding F_0 peak may or may not be aligned with the same syllable as the F_0 fall. The first alignment pattern was discussed in this chapter with regard to unreduplicated words. We saw that lexical contrasts are signaled by differences in the alignment of the F_0 *fall* with the prosodic head of the word.

In Chapter 5, I reviewed phonological evidence showing that the prosodic system of JC is best described as a weight-sensitive stress-accent system. I showed that in the unmarked case, stress in JC is assigned preferentially to heavy syllables and in the absence of heavy syllables to penultimate syllables. I argued that segmentally identical reduplicated words are differentiated by their stress pattern. This chapter also presented an analysis of word-level stress.

Chapter 6 reviewed the phonetic properties of intensive and distributive reduplicated words and a second alignment pattern was seen. Specifically, contrasts are signaled by differences in the alignment of the F_0 *peak* with the word. In addition, there was a difference in whether or not there was a prenuclear rise on the initial foot of the word. Both types of reduplicated words are similar in that they have utterance-final falls. However, in intensive words this is preceded by a prominence lending rise on the initial foot of the word.

With regard to the formal Optimality Theoretic account of reduplicated words, in Chapter 7, I showed that reduplicants in JC copy as much of their base as possible without exceeding prosodic limits. In fact, the process can be described informally as an ‘all or nothing’ strategy since if full copy is not attainable within the specified conditions, reduplication does not occur. Further, whereas intensive reduplications are doubly accented, distributive reduplications have a single nuclear pitch accent. I argued that these differences are related to differences in the prosodic structure of the words, by which the pitch accents are licensed.

This study has import for the study of reduplication processes crosslinguistically. Processes of full reduplication are often overlooked as being phonologically uninteresting since no phonological alternations are evident. The JC data presented here suggest that there are in fact phonological alternations albeit at higher levels of the prosodic hierarchy. In JC the morphological properties of the words interact with stress at the level of the prosodic word, to resolve segmental ambiguity in two reduplication processes. Empirically, this dissertation adds to the stock of cross-linguistic research on the study of prosodic disambiguation in languages. It provides evidence for an important link between the prosodic properties of reduplication processes and their semantic properties.

The research discussed in this dissertation is also important in that it contributes to the study of the prosodic system of Creoles, an area of research largely unexplored in Creole linguistics. It fortifies the type of groundwork necessary for using facts about the prosodic system of CECs to elucidate the discussions about the *origins* of these Creole varieties, as well as their relationship to each other (cf. Devonish, 1989, 2002).

This study has provoked interest in several aspects of research which merit future investigation; these are outlined below. First is the question of whether there are other acoustic cues to JC stress. As we saw in Chapter 4, the stressed syllable in JC consistently has a pitch fall onto that syllable. However, we need to discover what other acoustic cues are important in signaling stress. For example, cross-linguistic studies on the acoustic cues to stress contrast show that the most consistent and significant correlates are fundamental frequency and duration though there are other cues such as intensity and vowel quality differences (Fry, 1955, 1965; Lehiste, 1961; Bruce, 1977

among others). This is related to second issue, the listeners' perception of stress. It would appear that the percept of stress in JC may be elicited by reference to the alignment of pitch falls with the word. Another aspect for further investigation is to find out whether there are differences in the perception of stress related to the timing of the pitch fall. Verhoeven (1994), for example, showed that in Dutch, listener judgements were more sensitive to variations in the timing of F_0 falls than to variations in the timing of F_0 rises in utterances. The data discussed in Chapter 6 showed that there is a difference in the timing of the fall on the word-final foot in intensive and distributive reduplicated words. However, we do not know what effect the late versus early fall has on listeners' perception of semantic differences between these words. We also saw that some speakers produced intensive reduplications with a higher pitch on the initial foot in lieu of a prenuclear rise. The question is how are listener judgments affected by the presence or absence of the prenuclear rise in intensive words?

Following research by Kawasaki (1993) and Ohala (1993), I suggest that the perceptibility of stress might be enhanced where there is greater modulation in the F_0 signal, for example, where there is a fall in the pitch onto stressed syllables. According to Kawasaki and Ohala's research, greater modulation in a sequence contributes to greater perceptibility. However, in some cases we saw that the fall into the stressed syllable was absent in question intonation and further that this had the potential for contrast neutralization in the speech of some speakers. In these contexts, I suggest that listeners may have to rely on other acoustic cues to stress such as duration or vowel

quality differences as the timing cue will be less useful. I leave these issues open for future consideration.

APPENDIX A

Informant Data Sheet

Tape #: _____

Name: _____

Age: _____

Occupation (or parent for minors): _____

Education (highest level): _____

Places of residence:

Present: _____ from 19 _____ to _____

Past: _____ from 19 _____ to _____

Languages spoken: _____

Language used most often: _____

- in general: _____
- at home: _____
- talking about important things (school, business, etc): _____
- talking about family matters (quarrels, etc): _____
- talking to children: _____
- for gossiping, jokes, secrets etc: _____
- among close friends: _____
- in the community/neighborhood: _____

- Any other situations in which these languages are typically used

APPENDIX B

The following graphs show representative examples of the monosyllabic based reduplicated word *gringrin*, produced with an intensive meaning and a distributive meaning by RP.

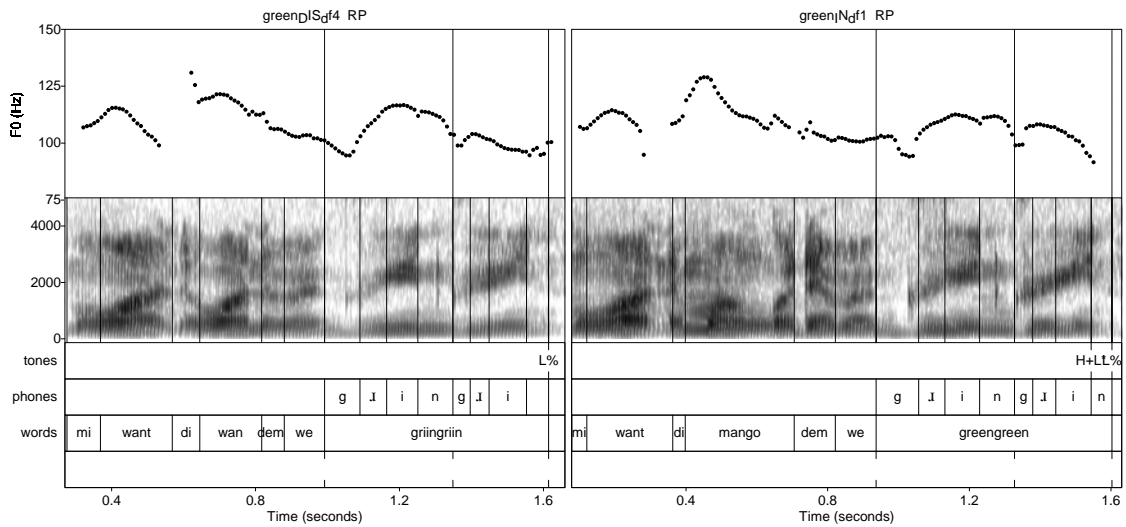


Figure B.1. Fundamental frequency contour of the reduplicated word *gringrin* produced with a distributive meaning ‘scattered green (left graph) and an intensive meaning ‘very green’ (right graph) in statement intonation final position.

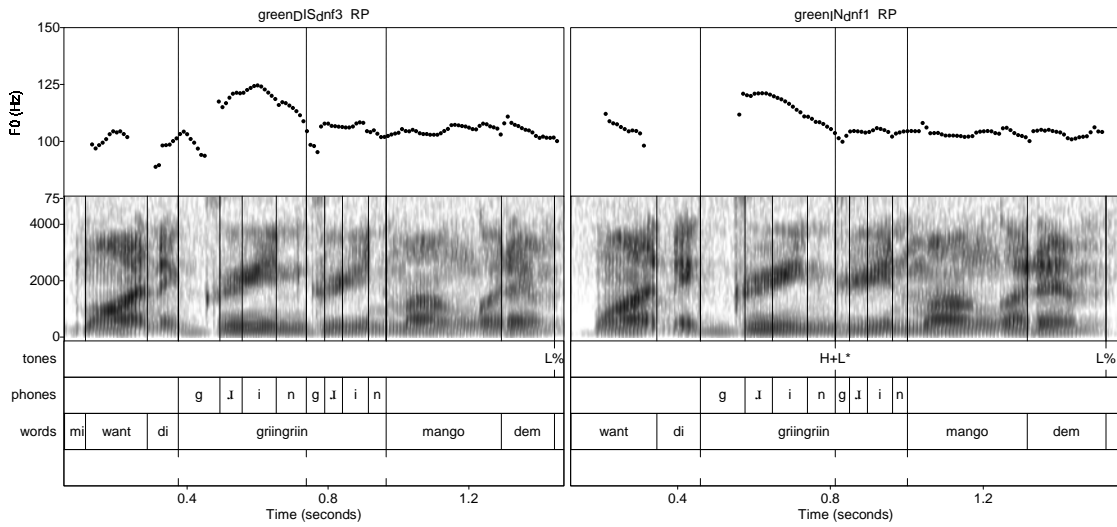


Figure B.2. Fundamental frequency contour of the reduplicated word *gringrin* produced with a distributive meaning ‘scattered green (left graph) and an intensive meaning ‘very green’ (right graph) in statement intonation non-final position.

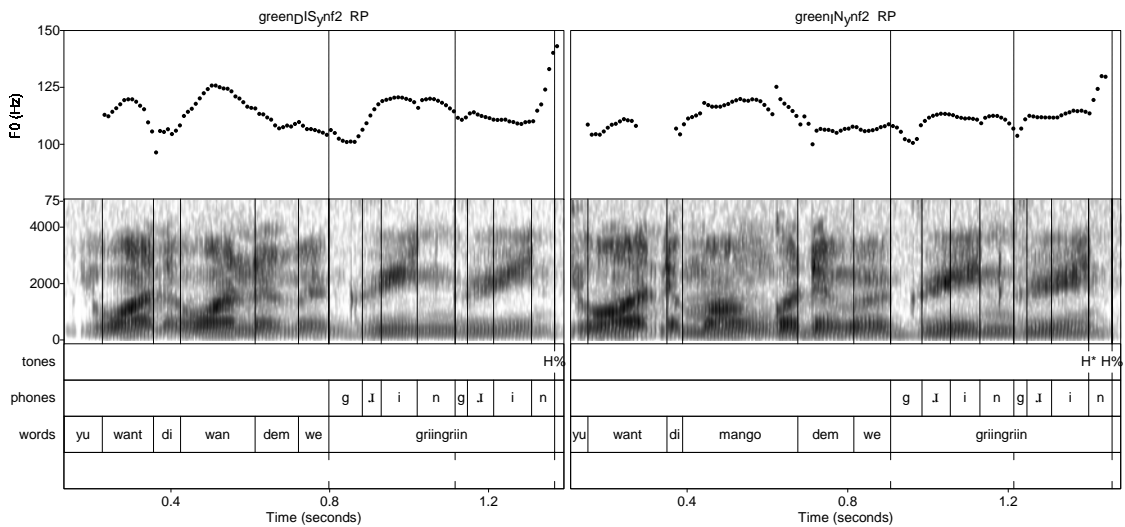


Figure B.3. Fundamental frequency contour of the reduplicated word *gringrin* produced with a distributive meaning ‘scattered green (left graph) and an intensive meaning ‘very green’ (right graph) in question intonation final position.

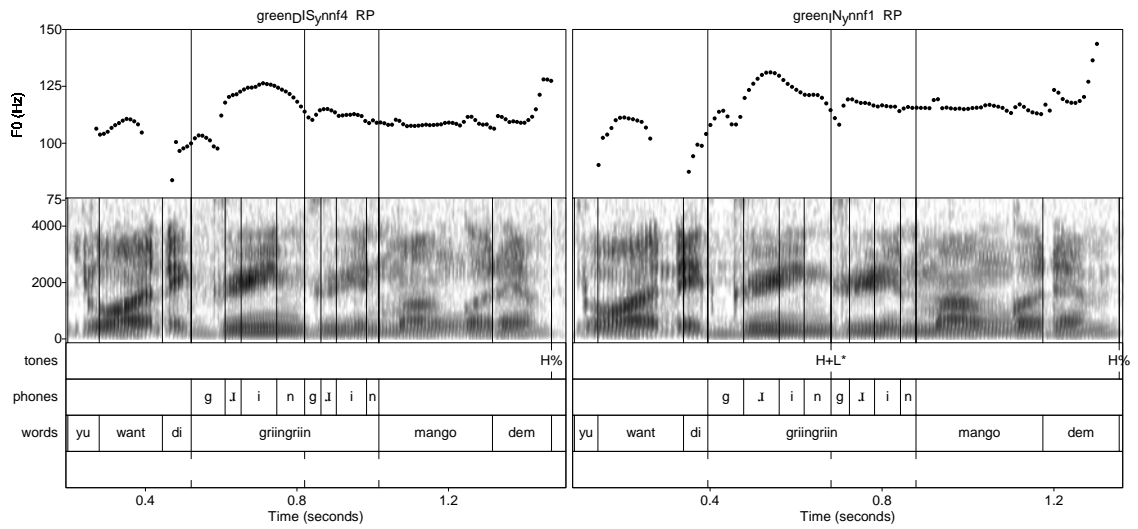


Figure B.4. Fundamental frequency contour of the reduplicated word *gringrin* produced with a distributive meaning ‘scattered green (left graph) and an intensive meaning ‘very green’ (right graph) in question intonation non-final position.

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APPENDIX A

Informant Data Sheet

Tape #: _____

Name: _____

Age: _____

Occupation (or parent for minors): _____

Education (highest level): _____

Places of residence:

Present: _____ from 19 _____ to _____

Past: _____ from 19 _____ to _____

Languages spoken: _____

Language used most often: _____

- in general: _____
- at home: _____
- talking about important things (school, business, etc): _____
- talking about family matters (quarrels, etc): _____
- talking to children: _____
- for gossiping, jokes, secrets etc: _____
- among close friends: _____
- in the community/neighborhood: _____

- Any other situations in which these languages are typically used

APPENDIX B

The following graphs show representative examples of the monosyllabic based reduplicated word *gringrin*, produced with an intensive meaning and a distributive meaning by RP.

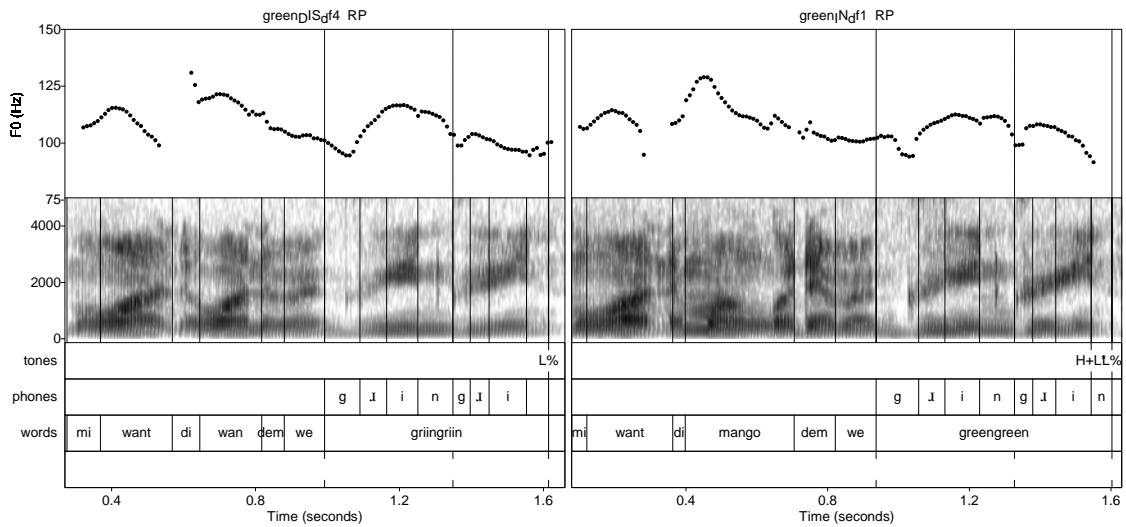


Figure B.1. Fundamental frequency contour of the reduplicated word *gringrin* produced with a distributive meaning ‘scattered green (left graph) and an intensive meaning ‘very green’ (right graph) in statement intonation final position.

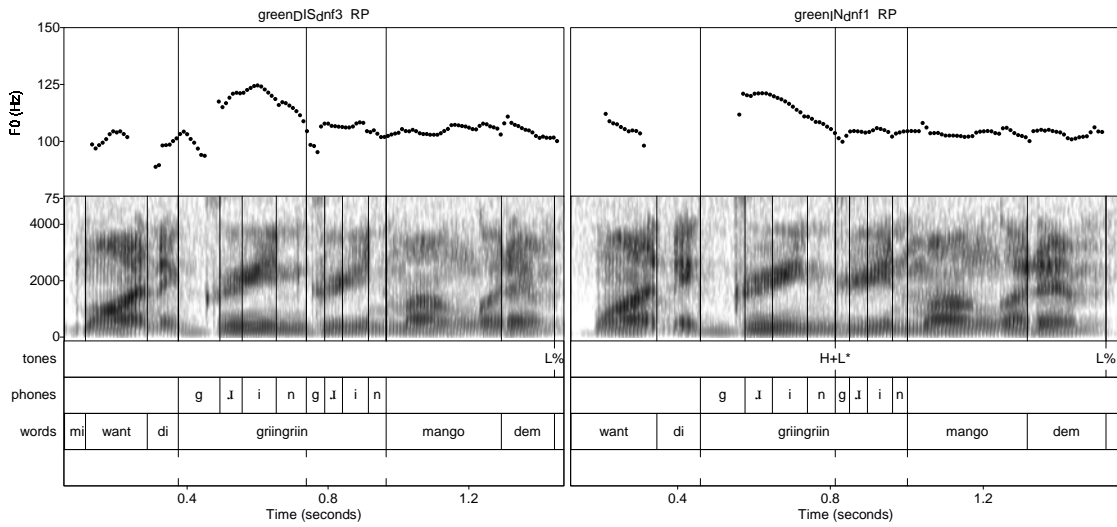


Figure B.2. Fundamental frequency contour of the reduplicated word *gringrin* produced with a distributive meaning ‘scattered green (left graph) and an intensive meaning ‘very green’ (right graph) in statement intonation non-final position.

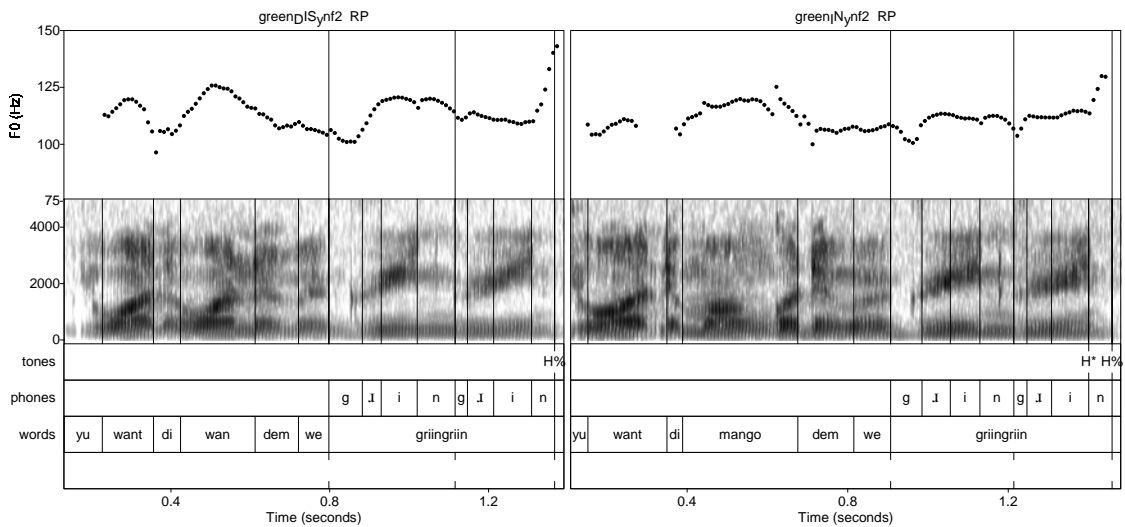


Figure B.3. Fundamental frequency contour of the reduplicated word *gringrin* produced with a distributive meaning ‘scattered green (left graph) and an intensive meaning ‘very green’ (right graph) in question intonation final position.

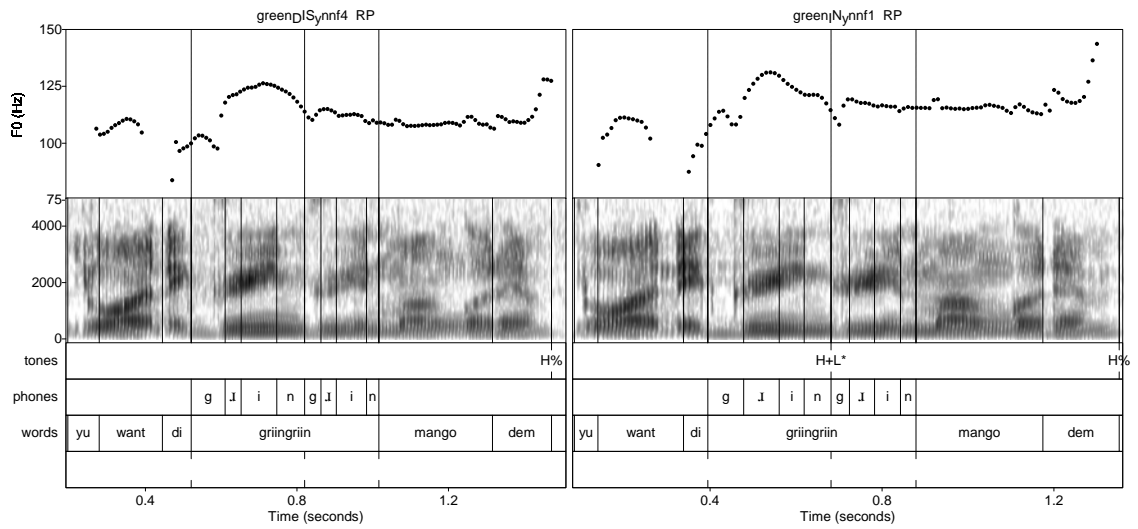


Figure B.4. Fundamental frequency contour of the reduplicated word *gringrin* produced with a distributive meaning ‘scattered green (left graph) and an intensive meaning ‘very green’ (right graph) in question intonation non-final position.

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