

DOWNSTEP IN SUPYIRE\*

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Downstep in the vast majority of cases can be traced to the influence of a low tone [Hyman 1979]. This paper discusses the case of Supyire, a three tone language with downstep unrelated to low tone. Sequences of high tones are automatically downstepped. Confusion with mid tone is in most cases avoided by a rule which raises mid to high tone; the two rules together creating a "flip-flop" effect. Supyire also has automatic downdrift of mid and high tones following a low tone. It thus presents an unusual combination of downstep and downdrift in the same language, but unrelated to each other.

1. Introduction

Hyman [1979] lists three criteria which can be used to distinguish a downstepped high tone ('H) from a mid tone (M):<sup>1</sup>

- (1) a. if this tone is a 'H, it will contrast with H only after H (or 'H);
- b. if this tone is a 'H, a following H tone will necessarily be realized on the same pitch level;
- c. if this tone is a 'H, the language should theoretically permit an infinite number of non-low tone levels, i.e. H - 'H - 'H - 'H ... .

Supyire has, in addition to a normal M tone,<sup>2</sup> a 'H which meets all three of the

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\*Supyire is a Gur language of the Senoufo group spoken in south-eastern Mali. I would like to thank Ely Sanogo for patiently supplying the data on which this paper is based, and Kenneth L. Pike and Inge Egner for reading and commenting on earlier versions.

<sup>1</sup>Only the last of these criteria is judged to be universal.

<sup>2</sup>The three contrastive levels of tone are seen in the following examples:

nyáára	'ask'	fyí	'sprout' (noun)
nyaara	'walk'	fyĩ	'blind man'
naàrà	'increase'	fyì	'python'

For a discussion of Supyire phonology and morphotonemics, see Welmers [1950, 1973]. It should be noted that Welmers does not discuss in either of the above works the topic under discussion in this paper.

above requirements. Consider the following examples:

- (2) a. kà u ú kú 'wíí  
and he SEQ it look at      - - -  
'and he looked at it'
- b. kà u ú kú bwó  
and he SEQ it hit            - -  
'and he hit it'
- c. u a nàŋkòlyè wíí  
he PERF man-old look at    - - -  
'he looked at an old man'
- d. u a nàŋkòlyè bwó  
he PERF man-old hit            - - -  
'he hit an old man'
- e. ntěncwó 'sí ntáá lí cáára  
Ntěncwó FUT find it arrive before    - - - -  
'Ntěncwó will arrive before it'
- f. yyéré 'sí 'wíí 'sá'áŋkì  
stop FUT look again            - - -  
'stop and look again'

The 'H of wíí in (2a) contrasts with the H of bwó in (2b),<sup>3</sup> thus satisfying criterion (1a). There is no such contrast after L (or M), as is seen in (2c,d).

Criterion (1b) refers to the familiar terracing effect encountered in languages with downstep. That Supyire downstep causes terracing is seen from (2e). The H of ntáá is realized on the same pitch level as the 'H of sí. The final M of cáára is realized one step lower than the 'H of sí. In other words, the entire register (=pitch region within which tones are realized [Clements 1971]) is shifted down one step.

Criterion (1c) is illustrated by (2f): there are five pitch levels, but the first four of these are H tones.

It seems clear from these examples that Supyire has a downstepped H. However, this downstepping is unusual for several reasons: (a) it is introduced entirely by rule. There is no need for it in the underlying forms. (b) The rule introducing downstep makes no reference to L tone. (c) The step down is

<sup>3</sup>The underlying tone of ku in these examples is M, as is the case for all simple class pronouns. This M becomes H by a process discussed in section 2.

total, i.e. 'H is realized on the same pitch as M would be, resulting in a "temporary" neutralization of the contrast  $H \neq M$ . (d) However, in a majority of the environments where downstep is inserted, another rule raises M to H, avoiding the neutralization mentioned in (c) above, and preserving the contrast  $H \neq M$  in the form  $'H \neq H$ . (e) Downstep is unrelated to downdrift after L, which also occurs in Supyire. Section 2 deals with (a-d) above. Section 3 deals with (e), and shows how both downstep and downdrift may be accommodated in the framework proposed by Clements [1979]. Section 4 is a summary.

## 2. Downstep and 'flip-flop'

All cases of downstep in Supyire are introduced by a simple rule:

(3) DOWN: H H  $\longrightarrow$  H 'H

There is no need for downstep in the underlying forms. The effect of this rule as it stands is that successive H tones automatically downdrift. I assume here the framework of autosegmental phonology (cf. Goldsmith [1976]; Leben [1978]), in which  $C\acute{V}$ ,  $C\acute{V}C\acute{V}$ ,  $C\acute{V}C\acute{V}C\acute{V}$ , etc., have one H tone each, a single tone being associated with one or more vowels, as follows:

(4)  $\begin{array}{ccc} CV & CVCV & CVCVCV \\ | & \swarrow \searrow & \swarrow \searrow \swarrow \searrow \\ H & H & H \end{array}$  etc.

Since downstep never occurs within a word in Supyire, the assumption that only one tone is involved in a H tone word of two or more syllables simplifies the statement of the downstep rule. If  $C\acute{V}C\acute{V}$  had two H tones, as in (5):

(5)  $\begin{array}{c} CVCV \\ | \quad | \\ H \quad H \end{array}$

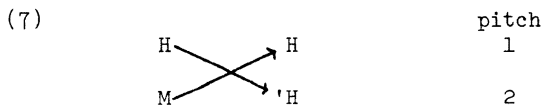
then the downstep rule would have to refer to word boundaries:

(6) H # # H  $\longrightarrow$  H # # 'H

As noted above, DOWN results in the automatic downdrift of H tones. This seems to contradict the data in (2a) and (2b), which show that H and 'H contrast after H. Either DOWN as formulated is wrong, or there is another process which creates sequences of H tone words. As we shall see, it is the second of these alternatives which fits the analysis presented here.

The most frequently downstepped items are verbs. This reflects the low statistical frequency of H tone nouns (less than 5 per cent of all nouns) and

the relatively high frequency of H tone verbs (over 20 per cent of all verbs). In most environments where H tone verbs are downstepped, another rule raises M tone verbs (and simple class pronouns) to H, thus preserving the underlying contrast  $H \neq M$  in the form  $'H \neq H$ .<sup>4</sup> This involves a flip-flop of underlying tones:

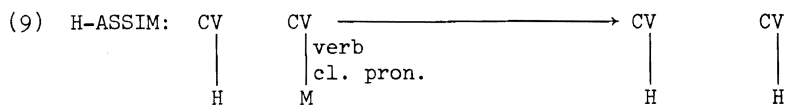


This means that Supyire has the following inventory of tonal contrasts:

- (8)
- a. after  $\left\{ \begin{array}{l} \text{pause} \\ M \\ L \end{array} \right\}$  :  $\begin{array}{l} H \\ M \\ L \end{array}$
- b. after H: either (1)  $\begin{array}{l} 'H \\ H \\ L \end{array}$  or (2)  $\begin{array}{l} 'H \\ M \\ L \end{array}$

In other words, the contrast  $H \neq M$  is realized on the surface as either  $'H \neq H$  or  $'H \neq M$  after H. Since  $'H$  and M are phonetically identical, the contrast in  $'H \neq M$  is in reality displaced onto the following words, which show whether terracing has occurred or not.

The rule raising M tone to H, yielding the contrasts in (8b1), may be informally stated as follows:



It is obvious that DOWN must apply before H-ASSIM, or (2b) would have downstep (and both (2a) and (2b) would have downstep before *ku*). Since a H tone word is downstepped after a H resulting from H-ASSIM, (as in the case of *'wíí* in (2a),

<sup>4</sup>A remarkably similar phenomenon is reported for Konkomba by Abbot and Callow [n.d.]. They set up two "General Tone Rules" as follows:

General Tone Rule 1: "a sequence of high tones is automatically downstepped between each high tone"

General Tone Rule 2: "if the sequence *any tone + high + low* would have occurred, then the low tone is raised to high."

It is possible that the function of this flip-flop is the same in Konkomba as in Supyire. Unfortunately the article by Abbot and Callow is primarily concerned with another tonal problem, so that the above rules are not explained in detail.

the two rules must apply iteratively from left to right. In other words, the application of H-ASSIM creates the environment for DOWN to apply to the right. Following are the derivations which would be required for the examples in (2a) and (2b). The domain of application of the rules is marked by brackets in the derivations.

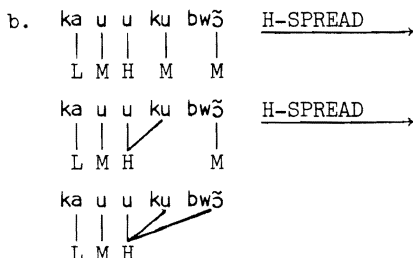
- (10) a. ka u u ku wii  
 L M H M H      underlying tones  
 \_\_\_\_\_  
 L M [H H] H      DOWN } 1st application  
 H-ASSIM }  
 L M H [H 'H]      DOWN } 2nd application  
 \_\_\_\_\_  
 H-ASSIM }
- b. ka u u ku bwĩ  
 L M H M M      underlying tones  
 \_\_\_\_\_  
 L M [H H] M      DOWN } 1st application  
 H-ASSIM }  
 \_\_\_\_\_  
 L M H [H H]      DOWN } 2nd application  
 H-ASSIM }

If we extend the analysis of CVCV as having one H tone realized on two successive vowels to permit the possibility of one tone being realized by the vowels of successive *words*, then the process described above as assimilation could be analyzed instead as spreading (cf. Schuh [1978]; Clements [1982]):

- (11) H-SPREAD: CV      CV      CV      CV  
 |      |      |      |  
 H      verb      H      M  
 M      cl. pron.      M

Since in the resulting structure there is only one H and not two, DOWN cannot apply. There is no need to order DOWN and H-SPREAD relative to each other. Each will apply whenever its structural description is met. The examples in (2a) and (2b) will then be derived as follows:

- (12) a. ka u u ku wii      H-SPREAD →  
 | | | | |  
 L M H M H  
 ka u u ku wii      DOWN →  
 | | | | |  
 L M H      H  
 ka u u ku wii  
 | | | | |  
 L M H      'H

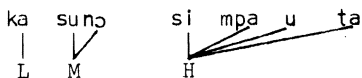


Since there is only one H tone in (12b) (though realized on three consecutive words), DOWN cannot apply.

The application of H-SPREAD results in sequences of H tone words on the surface which do not downstep.<sup>5</sup> In every such sequence, only the first word may have underlying H tone. All the subsequent words in the sequence must have underlying M tone. The H tones of the entire sequence are the manifestations of one H tone. One H tone is thus realized on a sequence of words, as in the following example:

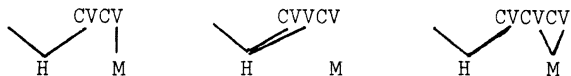
- (13) ka sunɔ si mpa u ta  
and diarrhea SEQ come him find 'and then he got diarrhea'
- |   |   |   |   |   |   |                  |
|---|---|---|---|---|---|------------------|
| L | M | H | M | M | M | underlying tones |
| L | M | H | H | H | H | surface tones    |

This may be diagrammed thus:



If the analysis with spreading of H tone is accepted, then Supyire is simply

<sup>5</sup>Note that in example (2e) H-SPREAD is blocked in the middle of *cáárá*. There are two classes of M tone verbs. In the first, the spreading H takes over the entire word, whether it is CV, CVV, CVCV, CVVCV, or CVCVCV. In the second, to which *cáárá* belongs, the spreading H takes over only the first syllable (CV or CVV). If the word has more than one syllable, i.e. if it is CVCV, CVVCV, or CVCVCV, then all vowels after the first syllable will bear the original M tone. Thus the application of H-SPREAD will yield the following configurations:



Notice that the difference between these two classes of M tone verbs is neutralized (in this particular environment) when they are monosyllabic. The word *bwɔ̃* of (2b) is in the first class, and *ta* of (13) is in the second class.

a case of a language in which successive H tones downdrift. According to Hombert [1974], this is unlikely in a language with M tone because of possible perceptual confusion with M. This confusion is doubly serious in Supyire because the downdrift is total, that is, a 'H is realized on the same level as a M would be.<sup>6</sup> Thus, if spreading of H does not take place (cf. (8b2)), a sequence of H M L will be phonetically identical to a sequence H 'H 'H.

Compare the following examples:

- (14) a. m̀̀ lá nyye sí 'fáágá 'wíí  
 my desire is FUT rock look at  
 'I want to look at a rock'
- b. m̀̀ lá nyye sí bǎǎga wíí  
 my desire is FUT hoe look at  
 'I want to look at a hoe'

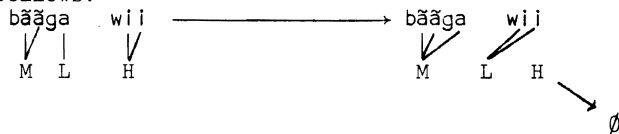
The succession H 'H 'H in (14a) is phonetically identical to the H M L of (14b).<sup>7</sup> Only by the addition of further words to these sentences can this ambiguity be resolved, e.g.:

- (15) a. m̀̀ lá nyye sí 'fáágá 'wíí numé  
 my desire is FUT rock look at now  
 'I want to look at a rock'
- b. m̀̀ lá nyye sí bǎǎga wíí numé  
 my desire is FUT hoe look at now  
 'I want to look at a hoe now'

It is evident that terracing has taken place in (15a), since the initial M of numé is lower than the tone of wíí. In (15b), terracing has not taken place, and the initial M of numé is higher than the tone of wíí.

<sup>6</sup>It is significant that Welmers [1950] records 'H verbs as M. In the sentences he elicited where H verbs are downstepped, the verb occurs sentence finally. It is only by the addition of further words in the same sentence that one can distinguish between 'H and M.

<sup>7</sup>The L tone of wíí in (14b) is due to a rule which does not concern us here: bǎǎga 'hoe' ends in a L tone which spreads onto the following H tone verb, as follows:







The rules accounting for register lowering would then be as follows:

- (20) PITCH INCREMENT: a.  $T_Q \longrightarrow +2 \text{ pitch/'}$  \_\_\_\_\_  
 b.  $T_Q \longrightarrow +1 \text{ pitch/'}$  \_\_\_\_\_  
 (T = any tone)

$T_Q$  designates the maximal string of tones in the relevant environment (usually up to the end of the sentence in Supyire). A sample derivation including both kinds of lowering is shown below:

(21)	ka	mii	i	na	a	pa	
	and I	SEQ	afterwards	PERF	come		'and afterwards I came'
	L	L	H	H	L	M	underlying tones
	L	L	H	"H	L	M	DOWN
	L	L	'H	"H	L	'M	DRIFT
	5	5	1	1	5	3	PITCH ASSIGNMENT
			1	1	1	1	PITCH INCREMENT b
				2	2	2	PITCH INCREMENT a
						1	PITCH INCREMENT b
	5	5	2	4	8	7	surface pitch

#### 4. Summary

Two analyses of the data have been offered in section 2 above. One analyzes the raising of M tone pronouns and verbs to H as assimilation. This analysis requires the extrinsic ordering of the assimilation rule (H-ASSIM) after the rule introducing downstep (DOWN). The alternate analysis allows for the possibility of a single H tone being realized on successive words. The raising of M tone pronouns and verbs is thus analyzed as a case of spreading (H-SPREAD), in which a single tone extends its domain over one or more words to the right, replacing the previous tones of those words. This has the advantage of not requiring extrinsic ordering of the rules involved.

Whichever rule, H-ASSIM or H-SPREAD, is adopted, it is clear that it plays a complementary role with DOWN. The two rules act together to prevent an underlying contrast from being neutralized. If one applied without the other, the contrast between H and M would be neutralized in that context. This does in fact happen in those environments where the grammatical requirements of H-SPREAD

are not met (e.g. in examples (14a) and (14b)). Since the application of DOWN is entirely automatic, it will result in a "temporary" neutralization in just these environments. This neutralization is usually dispelled by further words in the sentence (if there are any) which show whether terracing has taken place or not (cf. (14a) and (14b) with (15a) and (15b)). Even this delayed resolution would not be available if H-SPREAD occurred without DOWN.

A final point of interest concerns downdrift after L. As noted above, downstep in many languages seems to be historically connected with downdrift. This development appears to be taking place in a limited way in Supyire. In fast speech, a word internal L is sometimes not pronounced. Its presence is felt, however, by the lowering of the following tone a half step. This happens most frequently in nouns with final ML on the root, which take a M tone on the definite noun class suffix, e.g.:

- (22) pwũŋi  
 dog-definite singular suffix, noun class 1      'the dog'  
 ML M    underlying tones  
 ML'M    DRIFT  
 M 'M    L deletion  
 3 3    PITCH ASSIGNMENT  
  1    PITCH INCREMENT b  
 3 4    surface pitch

If this process continues, it could result in a surface contrast between H, 'H, and "H following a H tone.

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