Synchronic vs. Diachronic Naturalness: Hyman & Schuh (1974) revisited*

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In this paper I present and update some of the major points Russell Schuh and I made in our 1974 Linguistic Inquiry paper concerning universals of tone rules. Emphasis is on the distinction we made between synchronic and diachronic naturalness. Any diachronic change can be a synchronic rule while the reserve is not the case. We suggest(ed) that it is profitable to talk about natural synchronic rules that could not be (phonetically motivated) sound changes. This includes tone shifting, tonal polarity, and tonal downstep among possibly other commonly occurring tonal phenomena.

The GNTS [Great Ngamo Tone Shift] paper is maybe the best paper I have ever written. I felt like the data was making me into a magician.

(Email from Russell G. Schuh, July 11, 2005 re Schuh 2005; cf. Schuh 2017:135-142)

1. Introduction

In 1972 Russell Schuh and I wrote a paper entitled "Universals of Tone Rules: Evidence from West Africa". In this study, published in *Linguistic Inquiry* in 1974, we attempted to generalize from what we knew from our field experiences, from our courses at UCLA, and from what we had read and learned from others. As part of the journal review process we first had to defend ourselves against one very critical reviewer (who typed up 11 pages of comments single-spaced), but Jay Keyser, the editor of *LI*, decided that in addition to whatever other virtues the paper might have, the state of our knowledge of tone systems justified its publication. In honor of Russ, my purpose here is to discuss some of the issues that we raised and see how they have fared: what we got right, what we got wrong, what is still out there to be resolved. I first have to confess that I only remember rereading our paper one other time—and less carefully—before preparing the comments that I present here. However, having reread other ancient works of mine, I had been remarking to others that there are three possible reactions to re-reading something one has written a long time ago. I label them as follows, in English and Hausa:

(i) *Ignorance, rashìn sanìi*. I can't believe how little I knew then, how wrong I was, how embarrassing to make such strong pronouncements, given my youthful ignorance.

(ii) *Pride, yàbon kâi.* Hey, this isn't bad. Maybe I wouldn't say things today the way I did then, but I did a pretty good job, considering.

* My thanks to Roxana Newman and Will Leben for their help with Hausa and to Will for other helpful input on this paper, including editorial suggestions and corrections.

(iii) *Forgetfulness, màntuwaa.* I can't believe I knew all that back then. I don't remember saying that, reading those references, knowing all that. Did I really write this paper?

Having just reread Hyman & Schuh, I want to add a fourth possible reaction:

(iv) *Déjà vu, naa tabà ganinsà.* I can't believe I (we) already had those ideas back then. I thought I had just come up with these ideas recently.

This last response is reassuring, as it seems to suggest an intellectual consistency throughout one's career; however one would hope it does not instead indicate a lack of intellectual growth. Finally, the most expected reaction would probably include a mixture of emotions.[1]

In the following sections I will recapitulate and evaluate some of the generalizations in Hyman & Schuh, henceforth H&S, particularly our starting point, synchronic vs. diachronic naturalness, which led us to make certain claims that require further consideration. Some of the same ideas were repeated in our two chapters in *Tone: A linguistic survey* (Fromkin 1978), where we wrote on "Tone rules" (Schuh 1978) and "Historical tonology" (Hyman 1978). While H&S drew almost exclusively from West Africa (Benue-Congo and Chadic), my later chapter focused mostly on Bantu, while Russ' drew from all parts of the world.[2]

2. Diachronic naturalness

Among the basic assumptions Russ and I shared was the impossibility of truly understanding synchronic grammar without a diachronic perspective. This was a view we derived from the simultaneous descriptive and historical work that provided so much of the focus of our graduate studies at all levels of grammar at UCLA. We not only heard Talmy Givón's adage "... today's morphology is yesterday's syntax" (Givón 1971:413), but also sought phonetic explanations with Peter Ladefoged for the recurrent phonological patterns in one after another language. We also were influenced by the interplay between synchrony and diachrony in Natural Generative Phonology (Hooper 1973, 1976), including rule inversion (Vennemann 1972, Schuh 1972). Lurking behind all of this was Joseph Greenberg's state-process approach to language typology and universals (Greenberg 1966). In our survey of West African tone rules we attempted to take these ideas one step further, asserting that there was a difference between what was "diachronically natural" vs. "synchronically natural". Our assumption was that any diachronic tonal process (sound change) could also be a

[1] Although I felt mostly comfortable re-reading H&S, I found it a bit embarrassing to see more than one reference to "Hyman (in preparation)", a ms. on "Synchronic vs. diachronic naturalness" that never materialized. I think we prematurely announced intended publications more in those days than now.

[2] "Universals of tone rules: thirty years later" (Hyman 2007) is even more Bantucentric.

synchronic rule, but that the reverse was not the case: There are certain tone rules that could only be the result of restructuring, typically by the telescoping of multiple diachronic processes. While we were aware of the existence of unnatural or "crazy rules" (Bach & Harms 1972), our proposal was that certain recurrent restructured states could be considered SYNCHRONICALLY natural targets.

As many before us (and since), we thus assumed that "sound changes are basically phonetic in nature" (p.94), also that "... any context-sensitive sound change is... a possible synchronic phonological rule" (pp. 83-4). Our goal was to establish "an inventory of 'natural' rules of tone" (p.83), starting with what we considered natural phonetic tonal processes. I sketch three of these below, with brief updates of some of the advances that have been made since H&S.

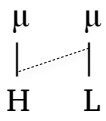
2.1. Tone spreading ("horizontal assimilation")

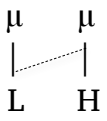
I suspect that other tonologists would agree that the most common phonetically motivated tone process is spreading from one tone-bearing unit (TBU) to the next, as in Gwari [Nupoid; Nigeria]: /súkNù/ → *súkũ̂* 'bone', /òkpá/ → *òkpắ* 'length'.[3] Since our work preceded the development of autosegmental tonology (Goldsmith 1976), we expressed our rules with a feature-copying format as in (1a).

(1) H tone spreading L tone spreading

a. /H-L/ → H-HL /L-H/ → L-LH

b.





However, it is quite clear that our conception was more like (1b), where μ = TBU:

"Spreading is an assimilatory process of the progressive or perseverative type, rather than of the regressive or anticipatory type. That is, the earlier tone appears to last too long, rather than the later tone starting too early. This in fact is the way that we would like to view this phenomenon. There is no process of tone copying or tone addition in the second syllable. Rather, the earlier tone simply enlarges its domain. What is of fundamental importance is that when the tone and the segmentals are out of phase, the tones invariably expand to the right and encompass parts of new syllables." (H&S, p.88; cf. Schuh 1978:230)

Although we did not have an appropriate formalism, the intuition was exactly what the autosegmental framework expressed so well by dashed association lines and multiple

[3] Tones are transcribed as follows: [á] H(igh), [ā] M(id), [à] L(ow), [â] HL falling, [ă] LH rising, [ꜜá] downstepped H.

linking. However, the bias we pointed out that tones tend to "drag on" has been confirmed in numerous subsequent phonetic studies, e.g.

"... the F0 target for a single static tone tends to occur at the (temporal) end of the associated phonetic region...." (Akinlabi & Liberman 2000:5)

"Late realization of tonal targets has been demonstrated both for languages in which tones are lexical... and for those in which they are intonational...." (Kingston 2003:86)

Such cases of tone spreading represent a natural phonologization process which occurs first where the sequenced tones are the furthest apart, e.g. creating HL and LH contours from H-L and L-H sequences, as in (1), without necessarily affecting sequences with M. [4] What is quite rare is for the reverse, anticipatory contouring to occur whereby /H-L/ and /L-H/ become HL-L and LH-H, respectively.

In H&S we were careful to state that only perseverative tone spreading can occur in "non-restrictive" tone systems which place few if any restrictions on the distribution of its /H/ and /L/ tones. Given our West African bias, we had less understanding of privative /H, Ø/ systems and of the anticipatory attraction of a tone to a prominent position. Our claim concerned the phonetic pressures on what tones (pitches) would do if left to their own devices:

"While the exact phonetic explanation is not clear to us at this time, it appears to be the case that when there is a nonsynchrony of the tones and the segments to which the tones are assigned, the tones last too long (spreading into following syllables) rather than begin too early. Phonetically, the laryngeal adjustments required to regulate pitch changes seem to require more time than the articulatory adjustments required to produce successive segments." (p.90, note 3)

However, with the advent of autosegmental tonology, it also became possible to analyze the downstep in a derivation of /H-L-H/ to H-ꜜH-H as anticipatory spreading of the second H with concomitant delinking of the intervening L. See Hyman (1978, 2007) and §3.3 below for further discussion.

2.2. Register adjustments ("vertical assimilation")

In contrast with TS, which involves a "horizontal" adjustment between tone and TBU, tones may undergo a "vertical" lowering or raising in certain contexts. As schematized in (2a), natural changes include raising of a L before H or a lowering of a H after L:

[4] While H&S document that a language can have H tone spreading or L tone spreading without having the other, H tone spreading has since been found to be more prevalent and to occur with fewer restrictions (Hyman 2007:7; Schuh, in press:242).

(2)	a. natural	b. less natural
	L-H → M-H	H-L → H-M
	L-H → L-M	H-L → M-L

Thus, /nì-bʊ́ː/ 'breast' is realized [nī-bʊ́ː] in Mbui [Grassfields Bantu; Cameroon] (H&S, p.86), and /cèkí/ 'woman' becomes [cēkí] (→ [cēk] before pause) in Ik [Eastern Sudanic; Uganda] (Heine 1993:17). As indicated in (2b), a H-L sequence is less likely to undergo raising of L or lowering of H. While a L to H interval is likely to undergo *compression*, as in (2a), H&S had not yet noted that a H to L interval is likely to undergo *expansion*. Thus, in Engenni [Edoid; Nigeria], a H is realized as a raised H before a L: /únwónì/ 'mouth' → [únwőnì] (Thomas 1974:12). Such an effect has been documented phonetically in a number of languages, e.g. in Thai: "The high was significantly greater in height when followed by either the rising or low tone...." (Gandour & Potisuk 1994:483). The double effect of lowering of H after L and raising of H before L undoubtedly feeds into the phenomenon of downdrift, the gradual lowering of an alternating sequence of Hs and Ls, the first process H&S listed as diachronically natural (pp. 84-5).

2.3. Contour simplification

H&S considered two kinds of processes converting tonal contours to level tones. First, by absorption, the endpoint of a contour is lost when followed by a tone beginning at the same level, as in (3a).

(3)	a. natural	b. less natural
	LH-H → L-H	L-LH → L-H
	HL-L → H-L	H-HL → H-L

Thus, in Falam [Kuki-Chin; Myanmar, Bangla Desh], LH rising tones become L before both H and HL tones: /tlă:ŋ/ 'mountɑin' vs. *tlà:ŋ lám* 'mountain road' and *tlà:ŋ thlûak* 'mountain brains' (personal notes). The rising tone does not change when followed by L: *thlă:ŋ sàrì?* 'seven mountains'. H&S viewed absorption as a subtype of perseverative TS: if the endpoint of the contour were to spread, it would be absorbed into the following like tone. Reverse absorption, as in (3b), is less prevalent, although potentially found as a subcase of anticipatory TS (cf. note 5). Newman (1995:766-767) reports optional H-HL → H-L affecting monosyllabic words in Maradi dialect of Hausa [Chadic; Niger]: *nân* 'here', *kù tsáyàa nân* 'stop here!' vs. *kù zóo nàn* 'come here!'.

Other cases of contour levelling were simply identified as "contour simplification", as when Gwari ML becomes M before M or H tone. Thus, /ōzà/ 'person' first undergoes M tone spreading to *ōzā̀* (realized as such before L or pause), then simplifies to M-M

before a non-L tone: *ōzā bmyá lō* 'the person is good'. While aware of the potential role of duration (contour tones take longer to produce than level tones) and the greater complexity of rising > falling > level tones (cf. Gordon 2001, Zhang 2001), we failed to emphasize that languages can vary in restricting contours by what precedes or follows them. Thus compare the following restrictions on LH rising tone in three closely related Kuki-Chin languages in (4).

(4)

	Hakha Lai	Falam	Kuki-Thaadow
LH-L	*	✓	*
LH-H	✓	*	*

As seen, Hakha Lai disallows LH before L, but allows it before H, while Falam does just the reverse, allowing LH before L but not before H. We can explain this difference by recognizing a conflict between articulatory vs. perceptual complexity: The LH contour in LH-L is perceptually distinct, but articulatorily complex as it involves two changes in pitch. The LH in in LH-H is less complex articulatorily with only one change in pitch, but perceptually complex, as the H part of the rise is easily masked by the following H, hence potentially subject to absorption (cf. Schuh 1978:232-3). While Hakha Lai and Falam choose to prohibit according to articulatory vs. perceptual complexity, respectively, Kuki-Thaadow avoids both complexities in disallowing LH (and also HL) before both L and H. The effect is to limit contours to final position, a general property first noted by Clark (1983).

In addition to the above, languages may require that a contour be approached from the same pitch level (L-LH, H-HL) or by a jump up or down (L-HL, H-LH) (Hyman 2007:12-18). A particularly striking case comes from Luba {Bantu; Democratic Republic of Congo], which is sensitive to both the preceding and following tone (Meeussen 1951, Coupez 1954:29-33): (i) If a contour is followed by a like tone, e.g. LH-H, progressive absorption will apply: /bà-dì-él-á/ → *bà-dy-èl-á* 'ils se jetaient'. (ii) If a contour is not followed, but is preceded by a like tone, e.g. L-LH, regressive absorption will apply: /bà-tù-énz-èl-è/ → *bà-tw-énz-èl-è* 'qu'ils fassent pour nous'. (iii) If a contour is neither followed nor preceded by a like tone, the full contour will be realized: /mú-tù-ám-ìl-é/ → *mú-tw-ămb-ìl-é* 'nous ayant dit'. This produces the following distributions (where those in parentheses are predicted, but not illustrated in Coupez's examples):

(5)

#	LH	L	→	LH-L		#	HL	L	→	H-L
#	LH	H	→	L-H		#	HL	H	→	HL-H
#	LH	#	→	---		#	HL	#	→	---
L	LH	L	→	L-H-L		L	HL	L	→	(L-H-L)
L	LH	H	→	L-L-H		L	HL	H	→	L-HL-H
L	LH	#	→	L-H		L	HL	#	→	L-H
H	LH	L	→	H-LH-L		H	HL	L	→	(H-L-L)
H	LH	H	→	H-L-H		H	HL	H	→	(H-L-H)
H	LH	#	→	H-L		H	HL	#	→	H-L

There thus has been a lot to add to contour simplification since H&S. (Contour tones are also not allowed in final position.) One final note concerns our statement: "It is not clear to us how L-F[alling] can in turn be simplified" (p.92). We now know that L-HL can simplify as L-M, L-L or L-ꜜL (downstepped L), among other possibilities. In Babanki [Grassfields Bantu; Cameroon] a H tone prefix + L tone stem undergoes the following derivation: /H-L/ → H-HL (by HTS) → L-HL (by prefixing lowering) → L-M (before H), L-L (before L or pause) (Hyman 1979:167).

With these natural phonetic processes established. I now turn to consider synchronic tone rules which may not derive from a single diachronic process.

3. Synchronic naturalness

While most of what we proposed concerning diachronically natural tone rules has been corroborated by subsequent work, our conclusions concerning synchronically natural tone rules beg for a reassessment. What Russ and I tried to say in H&S was that there are synchronic states that are as natural as the interacting diachronic processes that give rise to them. In the following subsections I discuss tone shifting, tonal dissimilation and polarity, and tonal downstep. In all three subsections we will see how H&S failed to consider the possibility of a /H, Ø/ privative contrast and tonal underspecification in general.

3.1. Tone shifting

In §2.1 we considered the case where a tone spreads and produces a HL or LH contour tone on the next syllable. In languages with a /H, Ø/ contrast, if the H similarly spreads in a local fashion, a H-H sequence will be produced, as in Kikerewe [Bantu; Tanzania]: /ku-bóh-el-an-a/ → *ku-bóh-él-an-a* 'to tie for each other' (Odden 1998:177). If the H subsequently delinks from its TBU, the result is tone shifting, as in closely related Jita /ku-βón-er-an-a/ → *ku-βon-ér-an-a* 'to get for each other' (Downing 1990a:265). Just as in the case of TS, shifting tends to be perseverative. However,

anticipatory shifting also occurs, as in Totela [Bantu; Zambia] /o-ku-hóh-a/ → *o-kú-hoh-a* 'to grow' (Crane 2014:65). Since shifting involves two sound changes (spreading and delinking), we did not consider it to be a natural diachronic process.[5] This is further supported by the fact that long-distance tone shifting occurs as a result of unbounded spreading to a designated position followed by delinking all of the Hs except the last. Thus, while Ndebele [Nguni Bantu; Zimbabwe] spreads an initial H all the way to the antepenult (Sibanda 2004:229), closely related Zulu [South Africa] shifts the H to the antepenult (Downing 1990b:265):

(6) a. /ú-ku-lim-is-el-a/ → ú-kú-lím-ís-e:l-a[6] 'to cause to cultivate for (s.o.)'
b. /ú-ku-hlek-is-an-a/ → u-ku-hlek-ír-a:n-a 'to amuse each other'

While it is rather common for a synchronically underlying privative H to shift to a prominent (e.g. accented) position, whether adjacent or not (cf. Hyman 1978:263-4, Goldsmith 1987:99), it is clear that non-local "displacement" cannot be accomplished in one diachronic step. This is particularly true in cases where the H shifts more than one word to the right, as in Giryama [Bantu; Kenya]: /á-na-mal-a ku-gul-a ŋguwo/ → *a-na-mal-a ku-gul-a ŋguúwo* 's/he wants to buy clothes' (cf. all L tone *ni-na-mal-a ku-gul-a ŋguuwo* 'I want to buy clothes', both forms occurring with phrase-penultimate lengthening). The reverse situation of a H shifting long-distance to a preceding prominent position is much rarer, if occurring at all. Whether shifting turns out to be local or at a distance, it is natural to avoid multiple H tones in sequence.

3.2. Tonal dissimilation and polarity

As in all of phonology, tonal assimilations vastly outnumber dissimilations, although the latter do occur. When these involve contours, e.g as when LH-LH becomes H-LH in Tianjin Mandarin (Chen 2000:105) or LH-HL in Hakha Lai (Hyman & VanBik 2004:825), it is easy to see the motivation of economizing the number of ups and downs. On the other hand, pitch changes increase when L-L changes to L-H in Munduruku [Tupi; Brazil] (Picanço 2005:312) or H-H dissimilates to H-L or H-Ø in

[5] While *ku-βón-ér-an-a* undoubtedly represents the correct intermediate tone spreading stage leading to Jita perseverative shifting, Totela may have developed either from anticipatory tone spreading, i.e. from *o-kú-hóh-a*, or from the development and subsequent anticipation of a HL falling tone which then simplifies to L: **o-ku-hóh-a* > *o-ku-hôh-a* > *o-kú-hôh-a* > *o-kú-hoh-a*. Such a development has been documented in phrase-final position in the Kirundi/Kinyarwanda complex (Philippson 1991:186) and led to the inversion of *H to a L-marked /L, Ø/ system in Ruwund (Nash 1992-4).

[6] A later process inserts a stem-initial L which in (6a) creates a downstep in the final output: *ú-kú-ꜜlím-ís-e:l-a* (Sibanda 2004:229-230). See Hyman (2014) for further discussion.

Bantu by Meeussen's Rule (Goldsmith 1984). Generally attributed to the Obligatory Contour Principle (Leben 1973, Goldsmith 1976), such cases of (particularly H-H) identity avoidance are rampant in the tonal literature—though underappreciated in H&S. It seems now that we can shift dissimilation into the diachronically natural category.

H&S were more convinced that tonal polarity is a synchronic epiphenomenon, distinguished from dissimilation:

"... a synchronic state of polarized tone exists when a syllable is assigned no underlying tone, but rather takes the opposite tone of a neighboring syllable. Dissimilation differs in that a syllable is assigned an underlying tonal representation, but when it is in proximity with a syllable of identical tone, its tone changes." (p.100)

The distinction may not always be crystal clear, as authors may disagree about whether an alternating TBU has an underlying tone or not. H&S cite the opposite H vs. L tones of the Hausa particle *nee* in *yáaròo née* 'it's a boy' vs. *jàakíi nèe* 'it's a donkey'. If *nee* is underlyingly toneless, then its output tone is assigned by opposite polarity with the preceding tone. If, on the other hand, it is assumed to have an underlying /L/ tone as per Leben (1971), it instead undergoes a rule of tonal dissimilation. The synchronic situation is complex (Newman & Jagger 1989) as is its history (Schuh 1989:261). In fact, H&S assumed that all cases of polarity represent a restructuring, hence complex history. We proposed the following possible source for a polar prefix tone (p.99):

(7) a. *LH-H > L-H
b. *LH-L > H-L

An original LH rising tone undergoes absorption before H, but "leveling" to H before L. (A different speculative account is given for Igbo *à-gá* 'going' vs. *á-zà* 'sweeping' on p. 100). It is however also possible that polarity develops directly from dissimilation. In Eastern Kayah Li [Karen; Myanmar], prefixes contrast in tone when the root carries /M/ tone: *ʔì-lū* 'the Kayah New Year festival' vs. *ʔí-vī* 'to whistle'. However, they take polar tone when followed by a /H/ or /L/ root: *ʔì-khré* 'to winnow' vs. *ʔí-lò* 'to plant (seeds)' (Solnit 2003:625). This seems to suggest that prefixes once contrasted *H and *L tones, but *H-H and *L-L dissimilated to L-H and H-L, respectively. Since polarity seems always to affect affixes or clitics, which by definition cannot stand alone, dissimilation can produce a situation where the choice of a single underlying tone becomes arbitrary (cf. Pulleyblank 1986:204-5). One can imagine a situation, apparently unattested, where /H/ and /L/ roots are free morphemes that can occur unaffixed, but change to L and H, respectively when an affix carries the opposite tone. In this case two dissimilatory processes conspire to produce the output polar effect. Although tonal polarity tends to be restricted to specific morphemes, it is so common

that it can be viewed as synchronically natural (cf. Newman 1995:775-6). It is however not clear that it results from a single diachronic process acting on the absence of tone.[7] For more on tonal polarity see Cahill (2006) and references cited therein.

3.3. Tonal downstep

Among other tonal phenomena that were said not to be diachronically natural is phonemic downstep, the phenomenon by which a contrastive drop resets the register of the following tones. In the early 1970s it was generally believed that downstep could be contrastive only between Hs, e.g. Igbo *ísí* 'head', *ísí* 'to cook', where a succession of downsteps could also be possible, e.g. *ú ꜜlọ́ ꜜátọ́* 'the third house' (Emenanjo 1987:13). What was not known was that some languages contrast H vs. ꜜH after L, as well as L vs. ꜜL, both in Bamileke-Dschang [Grassfields Bantu; Cameroon] (Hyman & Tadadjeu 1976). Both Bamileke-Dschang and Medumba (Bangangte) also have double downstepped H, as in *ʒú ꜜꜜmén* 'thing of child', also realizable as *ʒú ꜜú ꜜmén* (Voorhoeve 1971:50). A hallmark of downstep is that it is iterative, with no phonological restriction on the number of downsteps that are theoretically possible in an utterance. A number of examples have also been found for a M vs. ꜜM contrast which however usually does not allow for iterative lowering. All downstep tones place a pitch ceiling on tones that follow: a H that follows a ꜜH will be realized at the same level as the preceding H, not higher, and similarly for a M that follows ꜜM and a L that follows ꜜL.

Sticking to the case of H tone, the crucial belief of H&S was that ꜜH, although widespread and hence synchronically natural, always resulted from a complex history, thus was not diachronically natural. Instead, downsteps were seen to result from an historically lost L tone wedged between Hs: "The majority of cases of DS [downstep] known to me are directly derivable from or are assumed, explicitly or implicitly, to be derived from the loss of a LO tone between two HIs...." (Schuh 1978:239). Following Clements & Ford (1979) this came to be expressed autosegmentally as an unlinked L floating between linked Hs, as in the following Igbo derivation:

(8) /úlọ́ + ´ + àtọ́/ → úꜜlọ́ àtọ́ → úꜜlọ́ ꜜátọ́ 'the third house'

H L H L H H L H L H H L H L H

house of three

[7] With the subsequent development of extrametricality and underspecification theory, Pulleyblank (1986:205-6) was able to account for the Margi present tense polar prefix in *á-wì yú* 'I run' vs. *à-sá yú* 'I err'. This however does not represent a natural historical source, rather another restructuring.

As seen, there is a floating H "tonal morpheme" between the two words used also in genitive constructions, which links to the noun 'house', delinking its L tone. Similarly, the H of *àtọ́* 'three' spreads leftwards, delinking its initial L. As a result, the output contains two downstepped H tones, each produced at a lower pitch than the preceding (ꜜ)H. The result is summarized in (9a).

(9) a. H-L # H → H-ꜜH # H (Igbo)
b. H # L-H → H # H-ꜜH (Ngizim)

This autosegmental interpretation of Igbo of course requires anticipatory spreading. Other languages such as Ngizim spread the first H perservatively, as in (9b).[8]

Since we had insisted that an intervening L was required to derive a downstep, and since I had not yet gotten into Bantu (and hence did not fully appreciate /H, Ø/ privative systems), we were not prepared for Odden's (1982:179) demonstration that a H could automatically downstep after another H, as in Shambala [Bantu; Tanzania], where /ngótó/ → *ngóꜜtó* 'sheep' contrasts with H-H *nyóká* 'snake', derived from /nyóka/ by HTS. As Odden argues, Shambala has a /H, Ø/ system, where only /H/ is phonologically activated. Unless ꜜH always first develops from a historical lost L, certainly the majority case, we are faced with the possibility that *H-H > H-ꜜH represents a natural diachronic sound change.[9] It would then fall into the category of dissimilation. In fact, there is reason to believe that Meeussen's Rule represents a telescoping of two separate changes, the first creating a downstep, the second changing the downstep to L: *H-H > H-ꜜH > H-L.[10]

Before leaving this section we should, however, take note that languages may have downstep rules that are not synchronically motivated at all. Igbo is often cited as one such case, where the H tonal morpheme causes an unmotivated downstep, e.g. */ísí + ´+ éwú/* 'head of goat' → *ísí éꜜwú* (see Williamson 1986 and references cited therein). Of course an abstract L can be posited to account for the downstep, which has been known to be further "displaced" in other languages, e.g. Kanakuru [Chadic; Nigeria] (Newman 1974, cited in Schuh 1978:233-4) and Kikuyu [Bantu; Kenya]

[8] Ngizim actually will not spread the H across a voiced obstruent ("depressor consonant"). Thus only the second H-L-H sequence is affected in the derivation /ná bàkə́ tlùwái/ → *ná bàkə́ tlúꜜwái* 'I roasted the meat' (H&S, p.107).

[9] We would in this case also have to entertain the unlikely possibility of parallel sound changes affecting other tones: *M-M > M-ꜜM, usually the result of a lost L, and *L-L > L-ꜜL, usually the result of a simplified contour tone, e.g. *L-HL-L > L-ꜜL-L in Bamileke-Dschang (Hyman & Tadadjeu 1976:91-2).

[10] I first presented this possibility to A.E. Meeussen himself at the workshop on l'Expansion Bantoue, April 4-16, 1977 in Viviers, France, and he approved. I mentioned this idea in Hyman (1978:268) where, rather than appreciating the privative nature of such /H, Ø/ systems, I still considered that the H triggers were really *HL, such that *HL-H > H-ꜜH > H-L.

(Clements & Ford 1979:203-4), but these require at least a two-step diachronic derivation. Similarly, in Kalabari [Ijoid; Nigeria] one can propose a general synchronic rule of L tone insertion after a word-final L-H sequence to condition a downstep on a following H (Harry & Hyman 2014:663-664) vs. the reverse in Aghem where a floating L is deleted after a word-final prefix + root L-H sequence so as to prevent the downstep that occurs after the same root when it has a H prefix (Hyman 1986:212). As in the Igbo case, such specific synchronic rules are not possible sound changes, rather require a more complex diachronic scenario.

4. Summary and conclusion

I began with the conviction that Russ Schuh and I had concerning the usefulness of distinguishing diachronic processes from the synchronic rules that result from a succession of diachronic changes. In §2 I presented a subset of the phonetically natural sound changes that tones often undergo, distinguishing between tone spreading, register adjustments, and contour simplifications. In §3 I considered recurrent synchronic phenomena which typically (always?) have a complex diachronic source: tone shifting, tonal polarity, and tonal downstep. I pointed out that some of our claims were colored by the fact that we did not fully appreciate the consequences of privative /H, Ø/ tone systems.[11] We also did not have the benefit of expressing our insights in autosegmental notation. Still, most of our claims concerning processes that can be both diachronic and synchronic seem to hold up, if only as universal tendencies: tones tend to spread perseveratively, L-H sequence intervals tend to compress (and H-L sequence intervals tend to expand), contour tones tend to be leveled out. I take these conclusions to be non-controversial. [12]

Our second position, which was that diachronic processes conspire to produce synchronically "natural" states, may seem less straightforward. Whereas our diachronic naturalness was grounded in phonetics, different principles must be involved in motivating the output synchronic states, converting tone spreading into tone shifting, tonal dissimilation into tonal polarity, and H sequences into downsteps (with or without intervening input Ls). Concerning the first it seems that as spreading takes place, the next stage is to prohibit multilinked Hs. There clearly is no advantage to an input /H/ being shifted many syllables (potentially words) to its right, which also

[11] I did not address the fact that there also are /L, Ø/ systems.

[12] Another generalization not addressed in above sections is that the laryngeal properties of consonants tend to affect tone, while tone much more rarely affects the laryngeal properties of consonants. While we proposed a hierarchy expressing the tendency of different consonant types to raise vs. lower tone (p.110), there has been a lot more refinement of these effects in more recent work. See, for instance, Tang's (2008) dissertation co-directed by Russell Schuh and references cited therein.

potentially obscures the original source of the H (recall Zulu in (6b).[13] Polarity, on the other hand, appears easier to motivate, as it is intuitively rather simple and "surely must have natural advantages in terms of production, perception, memory, and/or other psychological factors" (Newman (1995:776). This leaves downstep, which can be motivated by contour simplification (HL-H, H-LH → H-ꜜH), tone spreading (H-L-H → H-H-ꜜH), or tone anticipation (H-L-H → H-ꜜH-H). While these all can be seen as minimizing ups and downs, the possibility of producing downstep from dissimilation (H-H → H-ꜜH) would require a different principle. Downstep clearly did not exist in Proto-Bantu but is so prevalent in the 500 or so daughter languages that it is hard not to see that the syntagmatic phenomenon is synchronically natural—as good or better a state than not having it at all. In short, tone shifting, tonal polarity and downstep are all good synchronic targets.

The above brief review of H&S is necessarily incomplete, as are the citations of work contemporaneous and subsequent to our efforts 45 years ago. I want to end with two final citations. The first quite surprised me as I reread it:

"Given the alternatives of analyzing a given synchronic alternation as conditioned by some abstract phonological unit or by a grammatical category, speakers will always choose the latter course." (H&S, p.94)

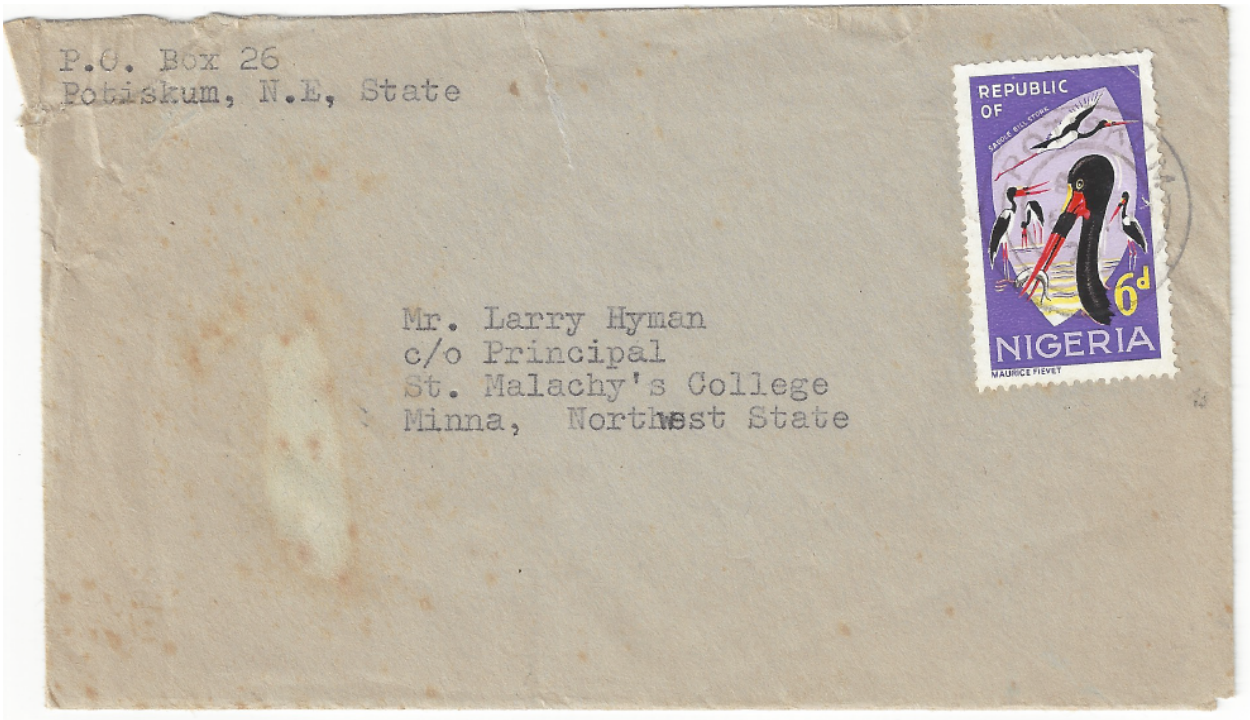
I have not discussed morphological or syntactic tone, replacive tone or prosodic domains in this paper. This will have to wait for another occasion. For now I simply point out that Russ and I had the above intuition and were thus adverse to overly abstract remedies to handle synchronically odd ("crazy") tonal alternations. Which brings me to the last quote, from Russ himself:

"... I'm busy as hell trying to tie up everything I've learned about Ngizim in the last 10 months. The tone system is very complex - I didn't know people could do such screwy things with only two tones — and it's only in the last month that I have gotten it squared away. Wallahi! Looking at these other Chadic languages really makes Hausa look different. Would you believe that Hausa does not mark aspect differences by different pronoun sets? Paul and I intend to write an article presenting evidence for this next year [the article eventually appearing as Newman & Schuh 1974] .... As ever, Russ."

The above appears in a letter dated August 5, 1970, mailed from Potiskum and addressed to me in Minna when we were both graduate students conducting research in Northern Nigeria. I wrote back that I was having an equally exciting (if not screwy) time with tone in Gwari, where at least we had a third, M tone (and in fact a downstepped ꜜM). I only found this letter from Russ a few days ago, i.e. exactly 47

[13] This clearly is extremely non-canonical in the sense of Corbett (2007since an exponent of a morpheme should ideally (canonically) convene on the same morph.

years after he wrote it. I wish I could have shared it with him. We would have had a good laugh.



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