# The phonology, phonetics, and function of tone displacement in Zulu*

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Many researchers report that depressor consonants ("D") induce breathy phonation on a following vowel (Tucker, 1949, Cope 1960 Westphal et.al. 1967, Rycroft 1980), as well as extreme pitch lowering. Following depressor consonants, high-tones on short vowels are displaced from their syllable of origin to a following syllable

DV┤CV┘ → DV⌋CV⍳

Moreover, tone displacement is blocked if a depressor immediately follows

DV┤DV⌋ → DV⌋DV⌋

1. Zulu depressors:

| | | | | | |
|---|---|---|---|---|---|
| voiced aspirated stops | ɓʰ | dʰ | | ɟʰ | ɠʰ |
| voiced aspirated affricates | | dʓ | | | |
| aspirated clicks | ɠ\|ʰ | ɠ‖ʰ | ɠ!ʰ | | |
| prenasalized aspirated clicks | ŋɠ\|ʰ | ŋɠ‖ʰ | ŋɠ!ʰ | | |
| voiced fricatives | v | z | ʒ | | ɣ |
| breathy nasals | m̤ | n̤ | | ɲ̤ | ŋ̤ |
| breathy glides | w̤ | ʓ | | j̤ | |

Lanham (1960:106) reports that while both Zulu and the related Nguni language of Swati display tone displacement in the context of preceding depressors, in Xhosa, another Nguni tongue, the so-called "active measure" of tone displacement corresponds to a mere tonal upglide: DV⍳CV┘.[1]

Rycroft (1980) hears neither breathiness nor voicing on depressor stops. He does, however, report that these stops' *releases* are breathy-voiced. In the context of a low-tone, the following vowel is breathy for its duration. In the context of a high-tone, the following vowel is breathy during its initial portion, and modal for its latter portion. he suggests that depressors might derive historically from fully breathy-voiced stops (i.e. those that are voiced on their closures as well as breathy upon their release), but have shifted over time to their current manifestation.

## 2. The sound substitution pattern: the phonology of Zulu tone displacement

* Thanks to Simon Donnelly, Chuck Kisseberth, Ian Maddieson, David Odden, and Margaret Russell for their helpful comments and suggestions.

[1] Chuck Kisseberth informs me (1999) that Xhosa speakers now freely vary between this tonal upglide, upglide-and-spread, and displacement realizations.

2. schematic:

D V C V(:)
| |
*L* **H**

examples:

| | | |
|---|---|---|
| i s i ɬ aː l o | chair | i z i ɬ aː l o | chairs |
| \| \| \| \| | | \| \| /\ \| | |
| L H L L | | L *L* **H**L L | |
| i↓ n s iː z w a | young man | j i n s iː z w a | by a young man |
| \| \| \| | | \| /\ \| | |
| H↓ L *L* | | *L* **H**L *L* | |

(depressors are underlined; displaced tones are **bold**; depressing effects are *italicized*)

However, tone displacement does not take place under certain conditions. First, displacement is not observed from penultimate syllables. Note that penults regularly lengthen in phrase-final position ("##").

3. a. schematic

D Vː C V ##
/ |
*L*H

| | | | |
|---|---|---|---|
| no displacement: | | displacement: | |
| z iː kʰ oː n a | they being present | z i kʰ oː n a | they are present |
| /\ \| \| | | \| /\ \| | |
| *L*H L H | | *L* **H**L H | |
| iˆ n dʰ uː n a | headman | e n dʰ u n eː n i | to a headman |
| \| /\ \| | | \| \| /\ \| | |
| H *L*H L | | H *L* **H**L L | |

b. schematic

D V C V #...
/ |
*L*H

Also, when the postvocalic consonant is also a depressor, displacement is not observed (4).

4. schematic:

D V D V(:)
/ |
*L*H

| no displacement: | | displacement: | |
|---|---|---|---|
| i z i ɠǃʰ oː k o | hats | i s i ɠǃʰ oː k o | hat |
| \| /\ \| \| | | \| \| \| \| | |
| L *L*H *L* L | | L H *L* L | |
| eˆ m bʰ u z iː n i | to a goat | i m bʰ uː z | goat |
| \| /\ \| \| | | \| /\ | |
| Hˆ *L*H *L* L | | H *L*H | |

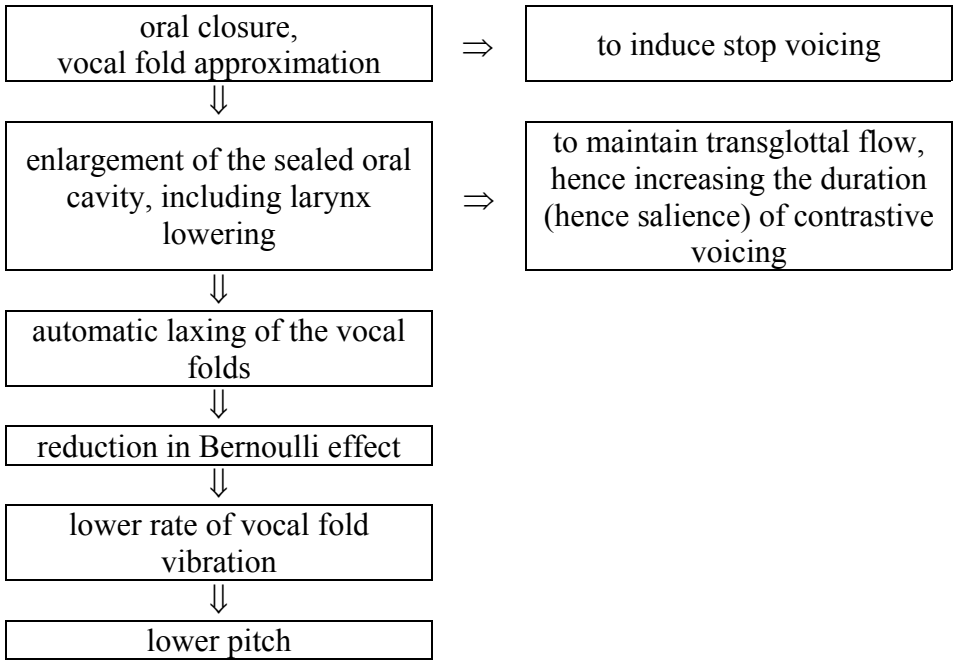
Here again, the vowel is implemented with a pronounced pitch rise, from very low to high.

Cope reports that displacement is further blocked in the context of a following low-high toneme cluster "on analogy with [depressor-induced] rising tones" (1966:86): /kún"ngásiː"kʰúndlá"ésìhlé+/ 'it may be good'. Additionally, Lanham states that displacement is blocked "if the displaced toneme is to fall on a monosyllabic root" (1960:107).

Hyman and Schuh (1974):
(1) high tones are more often phonologically active than low tones, in the form of spreading or displacement
(2) spreading or displacement is far more often rightward than leftward, and
(3) spreading or displacement is far more likely to take place when the pitch interval between the two tones is relatively great.

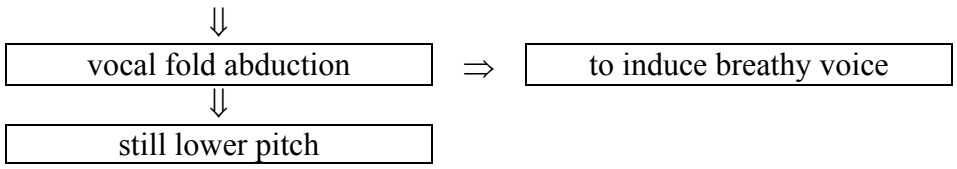
## 3. The phonetics of Zulu tone displacement

5.




Now, when we further add the partial vocal fold abduction necessary for breathy voicing, the Bernoulli effect should be especially weak, thus inducing further pitch lowering effects (6).

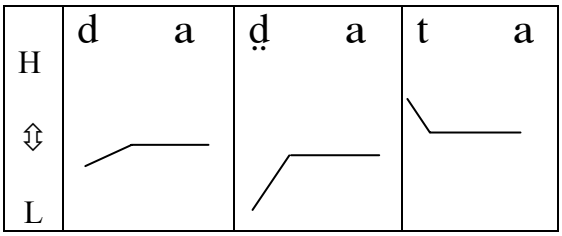
6.




Given the phonetic state of affairs around the interval of voiced aspirate release, pitch-lowering effects on the first portion of the following vowel becomes readily understandable.

In contrast to both voiced and breathy-voiced stops, voiceless stops are not associated with larynx lowering, and so the Bernoulli effect upon stop release may be greater here, thus momentarily increasing the rate of vocal fold vibration, hence pitch. And once again, please recall that even if epiglottal movement is responsible for present-day pitch lowering here, this vocal tract configuration may be seen a latter-day reflex of the earlier closure-voicing distinction—the "trigger" of tone displacement has changed, but the process remains.

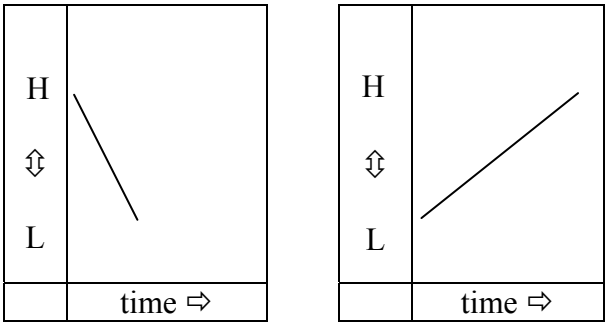
7.




In fact, Löfqvist (1973) as well as Hombert (1975) show that the pitch perturbing effects of stops' laryngeal settings persist for more than 100 msec after release, far longer than a purely proximal aerodynamic account would predict. The schematics in 7 reflect this finding, as I have drawn the steady-state portion of the pitch at different levels for each of the laryngeal settings. Moreover, Gandour (1974) reports that rising pitch contours persist longer than do falling pitch contours in Thai. This finding is reflected in 7 as well, on the assumption that that the Thai pattern is not unique in this respect.[2]

The second phonetic phenomenon that is relevant to the facts of tone displacement involves the speed at which pitch contours can be induced by the laryngeal apparatus. In two studies (Sundberg 1979, and Ohala 1979) it is reported that untrained subjects take a significantly greater amount of time moving from a lower-to-higher pitch in a given frequency range than vice versa. That is, pitch rises are accomplished more slowly than pitch falls of the same acoustic distance. Thus, the asymmetry observed by Gandour has been found in domains other than at stop offset. A schematic is provided in 8.

8.



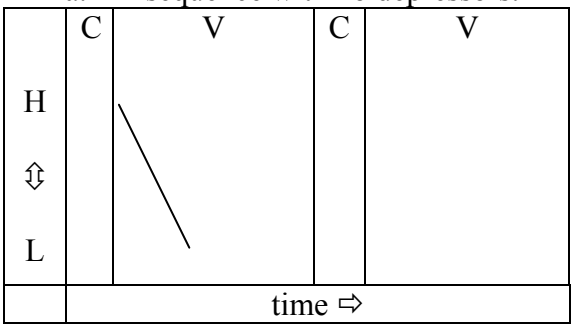

These two distinct phonetic findings regarding pitch may crucially interact in the context of Zulu tone displacement. Specifically, when considering the state of the larynx in combination with the state of the supralaryngeal articulators, a characterization of the phenomenon as an active "displacement" is revealed as illusory. What I mean here is that, in actuality, there is no displacement at all. Simply, given the pitch lowering effects of depressors, in combination with the sluggishness of pitch rises in comparison to pitch falls, the supralaryngeal articulators may

[2] Dave Odden (personal communication 1999) observes that voiced stops—involving a pitch rise—may induce tonogenesis, whereas voiceless stops—involving a pitch fall—never seem to. While this issue certainly warrants further investigation, the durational distinction between voiced stop offset rises and voiceless stop offset falls might in part account for this observation. Indeed, while Hombert (1975) finds that pitch falls are more accurately perceived than pitch rises, he also finds that the longer the pitch glide, the more accurately it is perceived. There is thus perhaps a trade-off between duration of contour and direction of contour in terms of perceptibility.

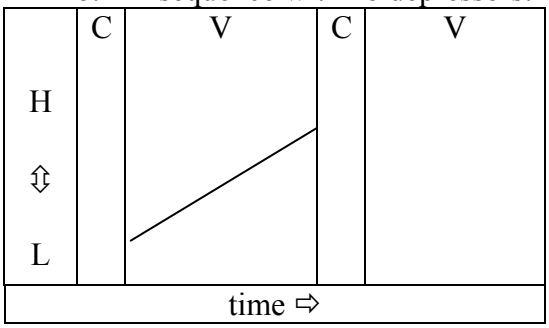
already have achieved the proper configuration for a following consonant *before* the pitch rise is fully achieved. The result is the illusion of tone displacement: upon the release of this subsequent consonantal gesture, finally, the high pitch is achieved, and thus it seems to have jumped from one vowel to the next. The schematic in 9d, which superimposes the relevant oral gestures on to the pitch contours, reveals the illusion of tone displacement.

9.

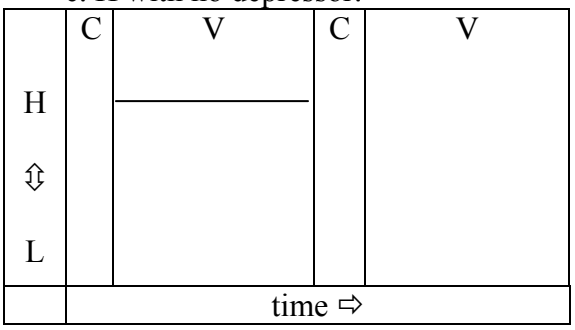
a. HL sequence with no depressors:



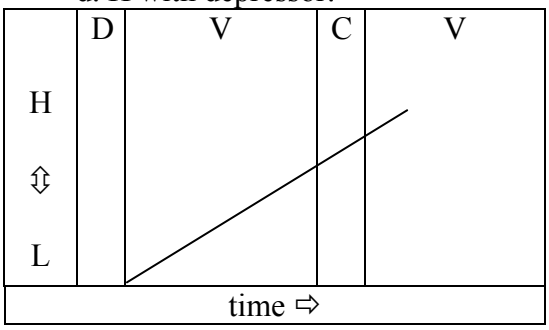

b. LH sequence with no depressors:




c. H with no depressor:

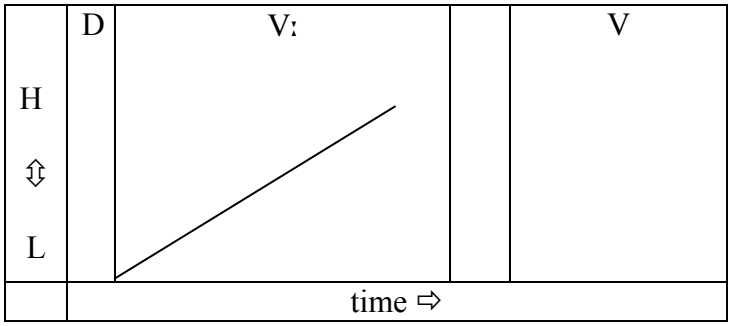



d. H with depressor:




Note that we now have an account of the so-called "blocking" of tone displacement from phrase-penultimate vowels. As these penults are automatically lengthened in Zulu, such vowels are apparently of sufficient duration to accommodate the pitch rise: the rise is achieved before the following consonant is implemented, and hence there is no apparent displacement (10).

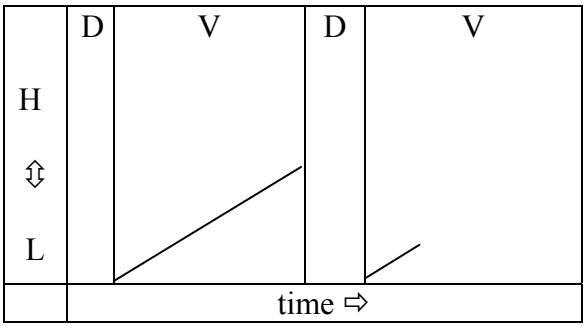
10.




We are, in addition, now able to account for the blocking behavior of *following* depressors. As following depressors once again induce a pitch-lowering effect upon their release, there is equally little hope of the displaced high tone being realized in this context. Consequently, even

in the context of a short vowel, such high tones are only realized at the end of their syllable of origin: here, the articulatory demands of the second depressor might indeed be characterized as "blocking" the propagation of the pitch rise (11).

11.




Thus, although depressors may no longer involve breathy phonation at their offset, the preceding scenario provides an externally consistent account of their paleophonetic origins.

## 4. The function of Zulu tone displacement

I have thus far suggested that tone displacement in Zulu is in part understandable when placed in the context of paleophonetic aerodynamic and articulatory theories. But simply because a sound substitution may have phonetic origins does not entail that phonetic factors are the only forces responsible for such phonological patterning. Conversely, simply because there may be a natural phonetic tendency towards certain sound substitutions does not mean that phonological systems necessarily respond accordingly: phonetic factors *can* induce certain sound substitutions, but this does not entail that they *will* induce these substitutions. There are non-phonetic factors that may curtail such natural tendencies.

For example, we have discussed the phonetic motivation for pitch lowering observed at voiced obstruent release. It turns out that such perturbations may be curtailed in languages with tonal contrasts. Thus Hombert (1978) discusses findings that in both Yoruba and Thai (both tonal languages), the duration of the perturbing effects of voiced releases is shorter than in a non-tonal language such as English. The motivation for this asymmetry would seem clear: as elongated pitch perturbations might jeopardize tonal contrasts in Yoruba and Thai, the tendency is curtailed. In English however, which is not tonal, there is no functional motivation to curtail the natural tendency toward pitch lowering. Note that I am not invoking a phonetically-based principle of economy-of-effort here. Rather, this characterization is strictly functional in nature: when it is functionally efficacious to curtail natural pitch perturbations, they may be curtailed; otherwise, they may not be. In sum, the natural tendency towards particular phonetic states may be curtailed in contexts when functionally relevant information—information about meaning distinctions such as those that tones encode—might otherwise be lost.

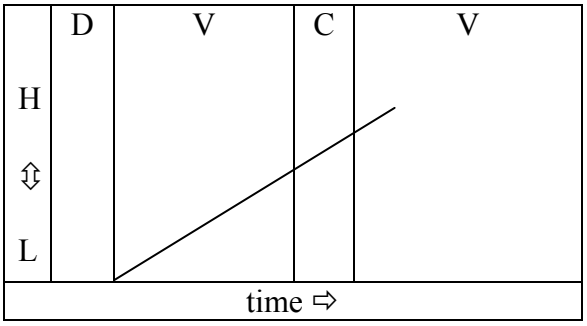
Returning now to tone displacement in Zulu, I argue in this section that functional factors do *not* in fact curtail the phonetic tendency toward tone displacement. Instead, indeed, they actually aid and abet it.

Let us first consider the functional consequences for Zulu were the displacement process to be curtailed. As discussed in Section 4, tone displacement is perhaps best regarded as an illusory consequence of timing distinctions between the oral and laryngeal articulators. But merely because the sound substitution may be induced by a natural phonetic process does *not* entail that this process is free to take place uncurtailed, as the consideration of pitch-lowering effects of voiced obstruents has just demonstrated. Let us then imagine the functional consequences of tone displacement curtailment, that is, were High tones *not* to be realized on a following vowel.

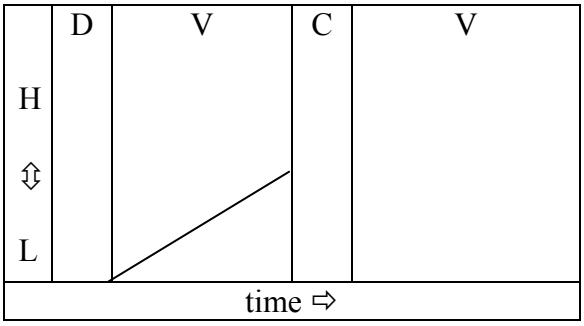
Consider the schematics in 12. In 12a I repeat the figure from 9d in which the higher pitch is achieved only as the following consonant is being released. In 12b, I present a hypothetical schematic involving the blocking of tone displacement in this same context.

12.

a.




b.




Now, what would be the functional consequences of blocking here? It is quite conceivable that the pitch rise, which is now limited only to the first vowel, would be insufficient for a reliable achievement of the contrastive value, that is, the so-called high-tone. Instead, due to the only limited temporal domain in which the pitch rise is implemented, it may be sufficiently curtailed so that it might be misperceived by the listener as belonging to the low-tone category. In turn now, this misperception of the High tone leads to a misconveyance of contrastive information. The functional consequence of such a misperception, then, is loss of contrastive information, that is, neutralization.[3]

In 13 I provide some hypothetical forms in which tone displacement does *not* take place; the potential for neutralization becomes clear.

[3] Recall that exactly such a curtailment takes place when a short vowel is flanked by depressors, and yet neutralization does not take place in that context (4). Russell (in prep., UIUC Phonetics Laboratory) is currently investigating whether depressor-flanked short vowels differ from others in terms of their pitch and durational properties.

13.

| attested non-neutralized forms: | | hypothetical neutralized forms: |
|---|---|---|
| i z̲ i ɬ aː l o<br>\| \| /\ \|<br>L *L* **H**L L | chairs | *i z̲ i ɬ aː l o<br>\| \| \| \|<br>L *L* L L |
| j̤ i n s iː z̲ w a<br>\| /\ \|<br>*L* **H**L *L* | by a young man | *j̤ i n s iː z̲ w a<br>\| \| \|<br>*L* L *L* |
| z̲ i kʰ oː n a<br>\| /\ \|<br>*L* **H**L H | they are present | *z̲ i kʰ oː n a<br>\| \| \|<br>*L* L H |

Instead, were this natural phonetic process to take place uncurtailed (as, in fact, it does), the chances of maintaining meaning distinctions are enhanced considerably. The historical scenario I envision then, is something like this: there may have been a point in the history of Zulu in which breathy-voiced consonants naturally induced an "unhinging" of following High tones such that the higher pitch fluctuated around the following consonant, being implemented with lower pitch when ceasing at the closure of the consonant, higher pitch when ceasing beyond its release. This unstable realization—this free variation—was eventually "pushed" toward a stabilized, displaced, higher realization in Zulu. The motivation for the direction of stabilization should *not* be viewed as due to a teleological force: it is *not* a consequence of speakers wanting to be clearly understood by listeners. The stabilization is best viewed not as a *cause*, but rather as a *consequence* of effective communication. More specifically, I mean that those tokens in which tones *were* displaced resulted in a less ambiguous speech signal, one in which all contrasts (and all meanings) were recoverable. It is, by hypothesis, a consequence of the reliability of their perception—on the part of the listener—that high-tones came to stabilize in the fashion they did, for listeners, having interpreted the signal unambiguously, were far more likely to employ a similar articulatory routine when using these forms in their own speech.

Note that a functional approach may additionally account for the noted blocking of tone displacement in the context of a following low-high toneme cluster, for if displacement were to take place here, the rising contour would likely neutralize to High.

14.

| attested non-neutralized forms: | hypothetical neutralized forms: |
|---|---|
| k u ↑ŋg̲ a s iː ...<br>\| /\ /\<br>H *L*H LH | k u ↑ŋg̲ a s iː ...<br>\| /\ \|<br>H *L*H H |

Moreover, recall that Lanham reports that displacement is additionally blocked in the context of depressors preceding monosyllabic roots. Were displacement to take place on to monosyllabic roots, their entire tonological structure would be altered, possibly resulting in homophony. Instead, the blocking of tone displacement here maintains root tonological properties, and the possibility of miscommunication is diminished.

Both of these blocking contexts may be motivated in functional terms, but not phonetics terms: as morphological and phonological distinctions are more readily retained upon blocking, the phonetically natural tendency toward displacement is diachronically curtailed.

## 6. Counterfunctionalism and pattern generalization

Although displacement does not take place from lengthened, phrase-final penults, recall now that neither does it take place from phrase-internal penults, which are not lengthened. In its present form, the phonetic/functional approach is clearly unable to account for the blocking of displacement in this context: as the vowel is short, we expect, counterfactually, that displacement will shift the high tone on to the final.

In fact, it is not uncommon for phonological patterns which can be phonetically and/or functionally motivated in certain contexts to expand, or generalize, into additional contexts where phonetics and function cannot be immediately invoked. The standard example of such developments is the case of utterance-, to phrase-, to word- to syllable-final devoicing. There are well understood phonetic reasons for utterance-final obstruent devoicing: the overall lessening of energy utterance-finally, coupled with the following silence, make it far less likely for these obstruents to be successfully voiced by speakers, and consequently heard by listeners. In contrast, of course, phrase-internal final obstruents are sometimes followed by sonorants, which will not serve to inhibit the likelihood of voicing. In time however, learners may come to generalize the devoicing pattern to new contexts which bear decreasing phonetic and structural similarity to the original context, in that they are less and less motivated by proximal phonetic forces—to the phrase, to the word, to the syllable. See Hock 1998 for additional examples of this sort. Thus, while behavior of depressed tones in Zulu phrase-final penults *can* be phonetically and functionally motivated, we can begin to account for the expansion of this pattern into related domains that are not immediately amenable to like-minded thinking: non-displacement from phrase-final lengthened penults may have generalized to include *all* penults. In short, phrasal phonology may encroach upon lexical phonology.

An additional counterfunctional component of the pattern involves displacement on to a high-toned short vowel (DV┤CV┤ → DV┘CV┤). Here, a high- versus low-tone lexical contrast may be jeopardized, since the first vowel is low, and the second vowel is high in either case. Once again, pattern generalization may have resulted in this counterfunctional result: observe that contrasts are always maintained, as opposed to obliterated, upon displacement, except in this one context. The pattern may more fully cohere upon vacuous displacement, at a minimal cost to functional efficaciousness. I note in passing that if Rycroft (1980) is correct regarding the phonation distinction between low tones and high tones in the context of a rightward depressor (that is, that in the context of a low-tone, the following vowel is breathy for its duration, while in the context of a high-tone, the following vowel is breathy during its initial portion, and modal for its latter portion) this phonation distinction may yet serve to establish a minor phonetic distinction between the two contexts.

## 5. Concluding remarks

As is clear from the Hyman and Schuh report of 1974, the Zulu pattern of tone displacement is hardly unique: variations on the Zulu theme are found in a wide variety of African tonal

languages. But indeed, this general pattern is attested in languages bearing no areal or genetic relation to those discussed by Hyman and Schuh.

In Comaltepec Chinantec, an Otomanguean language of southern Mexico, high tones spread to a following syllable when immediately preceded by a tautosyllabic low tone (Silverman 1997b). The pattern is almost always allophonic, and only rarely neutralizing.

In Beijing Mandarin, tones with high offsets substantially raise the pitch of a following tone in an allophonic fashion, especially at this following tone's onset; tones with low offsets show a significantly lesser effect in these same contexts (Xu 1997).

In Serbo-Croatian, high pitch accented syllables possess a rising pitch contour, with pitch peaks being realized on the post-tonic syllable, rather than on the accented syllable itself (Lehiste and Ivić 1986) .

A similar pattern is observed in Peninsular Spanish: stressed syllables typically possess a pitch rise, with the pitch peak being realized on the post-tonic syllable (Navarro-Tomás 1944, Fant 1984, Prieto, van Santen, and Hirschberg 1995).

One might argue that in languages where pitch is a cue for prominence, as in pitch accent and stress languages, it is the rising contour itself, rather than the high pitch, which are most perceptually prominent. However, this analyis cannot be applied to lexical tone languages, in which pitch patterns paradigmatically, rather than syntagmatically: the function of pitch in tone languages is to mark lexical contrasts, not to mark prominence. Consequently, the present approach to patterns of high tone displacement may account for all such systems, rather than just a subset thereof.

Note furthermore that the standard reasoning behind observation that high tones are more active than low tones may now be stood on its head. Traditionally, The phonological "activity" of high tones is regarded as evidence for the privative nature of High (that is, High is juxtoposed only with zero, not Low). Thus, High is active simply because is it phonologically specified, whereas for low tones, nothing is phonologically present to manipulate. However, we are now in a position to reverse the motivation for this observed patterning: linguists regard high tones as privatively specified only because high pitches are more susceptible to phonetic forces which distort their phonetic realization under different phonological conditions, the "activity" of High tones is a consequence of this susceptibility, not a consequence of their supposed phonological status.

In summary, I have employed the Zulu pattern of tone displacement to illuminate a number of phonological issues, and, to clarify certain methodological and theoretical distinctions.

First, I have argued for maintaining a disciplinary distinction between phonology, phonetics, and psychology/cognitive science with respect to explanation in phonology. While core phonological analyses consist primarily of the documentation of sound substitutions, external consistency with other domains must be striven for if explanation is to be the phonologist's ultimate goal. Phonologists have often ignored findings in these other domains in their methods and theories,

instead operating under the assumption that all explanation reduces to linguistic postulates themselves. This "linguistic reductionism" has resulted in analyses that do not necessarily hold up under scientific scrutiny. Note especially that while the present reasoning is surely speculative in nature, it is nonetheless testable, and consequently refutable, as the historical record is potentially available for inspection, as are the results of phonetic and psychological experimentalists. Such speculation should be contrasted with the speculative dimension of linguistic reductionism, in which theories can be tweaked and modified as researchers see fit, without regard to independent, theory-external testability.

Second, I have argued for a distinction between phonetic and functional influences on linguistic sound patterns. I have argued that physical properties of the speech mechanism—phonetic factors—may have initially induced the apparent "unhinging" of high tones in the context of preceding depressors. Furthermore, independent functional factors may have induced the stabilization, or phonologization, of tone displacement. As tones were less likely to neutralize upon displacement, displaced tokens were less ambiguously perceived, hence more likely to be reproduced (see also Ohala 1981, 1992, and Labov 1994, for further explorations of this listener-as-a-source-of-sound-change hypothesis).

Third, the present analysis of Zulu tone displacement is consistent with the hypothesis that any synchronic state of the sound system is primarily the consequence of evolutionary forces, including the consequences of misperceptions for the system's future state. I see no reason, in Zulu or elsewhere, to posit any sort of teleological forces on the sound system, such as synchronically imposed principles of contrast maintenance or economy of effort, and thus I see no reason to enshrine these supposed forces in a synchronic grammatical statement (see also Maddieson 1996, Ohala 1996, Hale and Reiss 1998, Hyman 1998, and Silverman 1997b).

Appendix: word list
(compiled by Margeret Russell; from Doke, C.M. and Vilakazi, M.A. (1972) *Zulu-English Dictionary,* 2nd edition. Witwatersrand University Press: Johannesburg. )

(a)
DV˥CV:˩→DV˩CV:˥

| | | |
|---|---|---|
| isidlonono | i˥si˦ɮɔ˦nɔ:˥nou˦ | person with long ears; savage looking person |
| isidletheva | i˦si˦ɮɛ˦t$^{h}$ei:˥va | strongly built person |
| isidlikithi | i˦si˦ɮi˦ki:˥t$^{h}$i˦ | very fat child; huge, bulky person; great physical power |
| isigcizelelo | i˦si˦g\|i˦zɛ˥lei:˥lou˦ | insistence, emphasis, repetition |
| isidlakathi | i˦si˦ɮa˦ka:˥t$^{h}$i˦ | giant; huge, powerful man |
| isingcofoza | i˦si˦ŋ\|ɔ˩fɔ˥za˩ | indentation, dent, hail |
| u(lu)dasana | u˥lu˥da˩sa:˥na˦ | thin, sickly child; small, spare person (term of contempt) |
| ubudedelele | u˥bu˥dɛ˦dɛ˦lei:˥lei˦ | feeling of mental fatigue or defeat |

(b)
CV˥CV:˩→CV˥CV:˦

| | | |
|---|---|---|
| indebelele | i˦nd ɛ˦bɛ˥lei:˩lɛ˦ | species of fish |
| i(li)delabuthongo | i˥li˦dɛ˦la˦bu˥t$^{h}$ɔ:˩ŋou˩ | hyena |
| inkephunkephu | i˦ŋkei˦p$^{h}$u˥ŋkei:˩p$^{h}$u˦ | a flaring up, flames |
| ukhisimusi | u˦k$^{h}$i˦si˥mu:˩si˦ | Christmas; public festival; picnic |
| u(lu)selekehleu˦l | u˦sɛ˦lɛ˥kei:˩ɬei˦ | small objects, minute grains |
| intshumayelo | i˥ntʃu˦ma˥jei:˩lou˦ | sermon address; preaching |
| isixhukulu | i˦si˦‖$^{h}$u˥ku:˩lu˦ | big, protruding mouth |
| i(li)wesheweshe | i˦li˦wɛ˦ʃɛ˥wɛ:˩ʃɛ˦ | person glib of speech |
| i(li)kalishi | i˦li˦ka˥li:˩ʃi˦ | carriage, Cape cart, etc. |
| isikhenke | i˥si˥k$^{h}$ei:˩nkei˦ | space, opening (when something is partly open); gap, breach |

(c)
DV˥DV:˩→DV˩DV:˩

| | | |
|---|---|---|
| izivuba | i˥zi˩vu:˩ɓa˦ | Great African Kingfisher, Ceryle maxima |
| izingulo | i˥zi˩ŋu:˩lou | instrument for skimming, strainer |
| izingcobe | i˥zi˩ŋ\|ɔ:˩ɓei˦ | species of rush, Cyperus textilis |
| izibhucu | i˥zi˩b$^{h}$u:˩\|u˩ | decayed matter, rotten fruit or flesh |
| izibhuda | i˥zi˩b$^{h}$u:˩da˥ | red haematite from which the red ochre for coloring is made |
| izindali | i˥zi˩nda:˩li˦ | market, auction; auction sale |
| ugebhuzizulu | u˥gei˦b$^{h}$u˥zi˩zu:˩lu˦ | praise name for a noted warrior |
| iziveke | i˥zi˩vɛ:˩kei˦ | species of flying fish, Pterois volitans |

(d)
CV˥DV:˩→CV˥DV:˩

| | | |
|---|---|---|
| isigele | i˥si˥gei:˩lei˦ | person with receding forehead (bald) |
| u(lu)ndlubu | u˥lu˥nɮu:˩ɓu˥ | single grain of a Voandzeia nut |
| isibhambho | i˥si˥b$^{h}$a:˩mb$^{h}$ou˩ | fiber belt worn by women (spelled isibamba in dictionary) |
| isigcino | i˥sig\|i:˩nou˦ | end |
| isigqisha | i˥si˥g!i:˩ʃa˦ | heavily built person |
| isibhuda | i˥si˥b$^{h}$u:˩da˥ | red haematite from which the red ochre for coloring is made |
| i(li)bumbhela | i˥li˦ɓu˦mb$^{h}$ei:˩la˥ | fabrication |

| | | |
|---|---|---|
| isibumbhatha | iˈsiˈɓuˈmbʰɑːˌtʰɑˈ | clump or clod of any soft clay-like stuff |
| isidada | iˈsiˈdɑːˌdɑˌ | expansive garden |
| i(li)dada | iˈliˈdɑːˌdɑˌ | duck |

(e)
DVːˈCVˌ→DVːˎCVˌ

| | | |
|---|---|---|
| dlula | ɮuːˎlɑˌ | pass, pass by, pass through |
| ugqumugqumu | uˈgǃuˌmuˌgǃuːˎmuˌ | Cape gooseberry, Physalis |
| umjibe | uˈmˌdʒiːˎɓɛɪˌ | grass-rope used for binding down the outside thatch of Native hut; rafter of a hut |
| jina | dʒiːˎnɑˌ | hlonipha term for bina, talk immodestly |
| ubudala | uˈɓuˌdɑːˎlɑˌ | age, oldness, old age |
| u(lu)dlame | uˈluˌɮɑːˎmɛˌ | main hut rafter; wattle framework of hut |
| indleko | iˈnɮɛrːˎkoʊˌ | loss, expense, expenditure, outlay (gen. used in pl. form izindleko) |
| ezami | eɾˈzɑːˎmiˌ | poss. pron., mine |
| bhongozela | bʰɔˌŋɔˌzeɪːˎlɑˌ | wail for; humour for; lead into ambush for |

(f)
CVːˈCVˌ→CVːˈCVˌ

| | | |
|---|---|---|
| isimunyu | iˈsiˌmuːˈnjuˌ | unpopularity (no pl form) |
| isibukeli | iˈsiˌɓuˌkeɪːˈliˌ | spectator, onlooker |
| isibuliso | iˈsiˌɓuˌliːˈsoʊˌ | form of greeting |
| dakashela | dɑˈkɑˈʃɛːˈlɑˌ | drag oneself along, walk along wearily |
| enzakalisa | ɛˈnzɑˈkɑˈliːˈsɑˌ | cause to get done, occur, happen |
| amatasatasa | ɑˈmɑˌtɑˈsɑˌtɑːˈsɑˌ | busied occupation (no sg. form) |
| intatabuka | iˈnɑˌtɑˌɓuːˈkɑˌ | physically weak person, of slow movements |
| isixabano | iˈsiˌǁɑˌɓɑːˈnoʊˌ | cause of quarrel or disagreement |
| phiklela | pʰiˈkɛˈleɪːˈlɑˌ | persist, persevere, continue obstinately |
| uloya | uˈlɔːˈjɑˌ | life essence, spirit or mind of a person; core of something |

(g)
DVːˈDVˌ→DVːˎDVˌ

| | | |
|---|---|---|
| isigcingi | iˈsiˌgǀiːˎŋiˌ | hlonipha term for isigubhu, drum |
| izidli | iˈziːˎɮiˌ | a person who eats too much (apex of thatched roof in dictionary) |
| imbhumbha | iˈmbʰuːˎmbʰɑˌ | species of cow-peas, Vigna sinensis, mashed to eat |
| isigada | iˈsiˈgɑːˎdɑˌ | |
| ugade | uˈgɑːˎdeɪˌ | dry, hard soil; unploughed soil |
| ingede | iˈŋɛːˎdeɪˌ | nervous trembling |
| ujinja | uˈdʒiːˎndʒɑˌ | ginger (from Eng.) |
| i(li)zeze | iˈliˌzɛːˎzɛˌ | flea |
| isigciviza | iˈsiˌgǀiˎviːˎzɑˌ | flat object |
| u(lu)vave | uˈluˈvɑːˎveɪˌ | splinter; long, broken fragment |

(h)
CVːˈDVˌ→CVːˈDVˌ

| | | |
|---|---|---|
| isidli | iˈsiːˈɮiˌ | person who eats too much (apex of thatched roof in dictionary) |
| isidafazi | iˈsiˈdɑˌfɑːˈziˌ | anything flat, stumpy, squat (ex. dwarf) |
| dibikeza | diˈɓiˈkeɪːˈzɑˌ | cover |

| | | |
|---|---|---|
| gcwiliza | g\|wi˥liː˥zɑ˩ | ferment, bubble |
| mukuza | mu˥kuː˥zɑ˩ | slap in the face with open hand |
| isixhuge | i˥siˊ‖ʰuː˥geɪ˩ | lame person, one who walks with a limp |
| ingxabalazi | i˥ŋ‖ɑˊɓɑˊlɑː˥ziˌ˩ | mashy, semi-liquid food, of which the ingredients have not been properly mixed |
| ulasikugu | u˥lɑˊsiˊkuː˥gu˩ | species of boot dance, now becoming obsolete |

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