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A survey of voicing in Dutch Derivatives: Afrikaans and Negerhollands

Introduction

The present work comprises a study of voicing in two Dutch-derivative languages, Afrikaans and Negerhollands. The subject of voicing has enjoyed a great deal of attention in the Netherlandic linguistic community, both with regard to Standard Dutch and to regional and social dialects. It has been studied less, however, for those linguistic systems that resulted from the exportation of Dutch in situations where Creoles developed. Two objectives underlie the present article: the presentation of data on each of the codes and a comparison with Dutch, and a preliminary phonological analysis of these data incorporating phonetic observations of the naturalness of voicing.

The subject at hand represents a departure from traditional Netherlandic studies *extra muros*; indeed, the status of the two languages that comprise the focus of discussion in this paper present numerous conceptual challenges for *neerlandici*. Afrikaans is normally considered a distinct language and is rarely referred to by non-linguists as being a Creole; even within the linguistic community, there is no consensus on its typological status. Negerhollands, while an acknowledged Creole, presents a different challenge, namely that it is an extinct code: the last speaker passed away in the 1980s. However, the topic of Dutch-based derivative codes is of interest to the community of Netherlandic scholars, as it offers a glimpse into the linguistic development of Dutch and the present-day status of her daughters. Furthermore, the examination of issues such as this highlights the forces acting on any language and hints at the complexity of human communication, both in general and as specifically manifest in the Netherlandic world.

I. Overview of Creoles: Afrikaans and Negerhollands

Creoles are a relatively new domain of linguistic research, gaining wide interest in the linguistic community in the 1950s and 1960s. With few exceptions and for a variety of reasons, discussion of these languages was ignored by earlier generations of linguists and language specialists. For this reason, it seems useful to offer a brief discussion of Creoles and Creolization in this section, prior to the presentation of data of interest to the subject. I adopt Chaudenson's definition of Creoles: "des variétés de langues qu'on rencontre dans certaines anciennes colonies européennes et qui, tout en

étant manifestement issues des langues des colonisateurs, constituent des systèmes linguistiques particuliers et autonomes" (1995: 4).

The debate surrounding the manner in which these related but autonomous systems evolved can hardly be settled in this article, nor do we have space to respond to questions regarding the genesis of Pidgins and Creoles (see Chaudenson 2001: 35-52 for discussion of mono- and polygenetic theories, and Stolz 1987 for questions of particular relevance to Dutch-based Creoles).[1] If we greatly simplify the commonalities implied by Creoles and the processes whereby these codes emerged, we may underscore three crucial factors. Firstly, these are languages that evolved in a short period of time, in relative isolation and in societies comprising a mix of peoples, brought together as the result of slavery, intensive trade and/or colonization. Secondly, these are independent, albeit genetically-related linguistic codes; the system of Haitian French Creole, for example, is rather clearly related to that of European French, but also presents numerous structural divergences, and the two languages are for the most part mutually unintelligible to their respective speakers. Finally, Creoles do not represent the simplification of an original code *stricto sensu*, but do express a great degree of optimization, especially with regard to morphology and analogical leveling, the correspondence of one morpheme to one word (Hjelmslev 1938: 285).

The commercial and political history of the Netherlands from the seventeenth century onwards, the period during which extensive trade routes and settlements were developed in Africa, Asia and the Americas, also lent itself to the export of the Dutch language. The direct connection of Dutch colonial rule with the development of Creoles is not as tenable as in the case of English- and French-based Creoles, however. Dutch was exported principally via commerce and trade, with political administration and scholarship playing only a secondary role in numerous contexts. Two examples suffice to underscore this important observation. Papiamento, widely spoken by the inhabitants of Aruba (a part of the Netherlands since 1636), is largely based on Spanish and perhaps Portuguese. On the other hand, Negerhollands, also referred to as Negro or African Dutch, was widely spoken for many generations on islands belonging to the Danish crown (and later to the United States), which were not under the direct control of the Low Countries.

The two Dutch-based Creoles presented here have been chosen firstly because of the relative abundance of information available about their form and use. While the disparities between Negerhollands and Afrikaans are great - perhaps more so than between either of them and Dutch itself - this comparison draws attention to the linguistic forms that, in a situation lending itself to the development of Creoles, are susceptible to change. The trajectory of these changes offers evidence as to the role of phonetics in the development of phonological grammars and highlights some particularities of Dutch itself.

The first Creole we discuss is Afrikaans. Actually its status is far from agreed upon: for many language specialists, especially in South Africa, this is not a true but a semi-Creole. Their observations are based not only on the particular development of the language, but also on the relative structural proximity noted between it and Dutch. However, partisans of the semi-Creole approach

are forced to ignore many of the developmental and structural features of Afrikaans that are similar to other Creoles, for instance, the loss of gender and the levelling of verbal inflexion. The precise definition of Creole or semi-Creole is in any case not crucial here, so I include Afrikaans, because of its derivative nature with regard to European Dutch (see de Kleine 1997: 289-295 for a more complete discussion of the issue).

The history of Afrikaans began in the mid-seventeenth century, when a small group of Dutch traders settled the area of present-day Cape Town. Afrikaans emerged from a complex sociolinguistic dynamic involving speakers of a local language called Khoi, French Huguenots, English traders, and speakers of a Portuguese-Malay Creole; it also almost certainly combined elements of a previous Dutch-based Pidgin. The Cape Colony was effectively cut off from the Netherlands in 1791, when control passed to the British, who began intensive settlement. Afrikaans later moved inland, where it continued to evolve, eventually becoming one of the two official languages of South Africa in 1925. As a result of the political events of the early 1990s, Afrikaans now enjoys co-official status with some ten other languages. For a more complete understanding of the particular evolution and present-day form of the language, the reader is referred to de Kleine (1997), Kloeke (1950), and Nienaber & Nienaber (1941).

Apparent developmental similarities between Afrikaans and Negerhollands, the other focus of discussion in this article, are overshadowed by the radically different internal histories of the two languages and of their respective communities. None the less, the development of these two languages began at roughly the same time and for similar reasons. Negerhollands appeared in the early 17th century, on the establishment of trading relations among Dutch and English colonists in the West Indies and their contacts with the native and - increasingly numerous - imported African slave populations. Although the islands of St. Thomas, St. Jan and St. Croix were Danish (until 1917, when they were sold to the United States), they were colonized in large part by settlers recruited from the Dutch Brandenburg company. Negerhollands was never the sole language of the islands, but it was evidently spoken by large portions of the population until the twentieth century, when its status declined for a number of reasons, not the least of which was the increase in tourism and the corresponding decrease in farming and plantation-based commerce (Stolz 1987 & 1986; Sabino 1990). With the death of its last speaker in the mid-1980s, Negerhollands ceased to exist. Fortunately, a substantial literature describing its form and function, written by linguists, historians and sociologists, is available to the researcher; the reader is referred specifically to Sprauve (1990), Hesseling (1905) and Stein (1985).

II. Voice in Dutch, Afrikaans and Negerhollands

Voice is a phonetic phenomenon describing the status of the glottis during the production of a sound; for all the languages with which this article is concerned, production of speech sounds involves the manipulation of the oral cavity and its articulators while breathing out. When the vocal cords are close enough together, they vibrate; this results in voiced sounds, such as [b], [d] and [g] in beer, deer and gear, or [v] and [z] in gave and gaze. When the glottal folds are apart, vibration

does not occur; this situation obtains voiceless sounds, such as [p], [t] and [k] in peer, tear and care, or [f] and [s] in laugh and gas.

An investigation of voice in Afrikaans and Negerhollands must concern itself with three questions. Firstly, what are the relevant voiced and voiceless segments in each language, as well as in the mother language, i.e. Dutch? Secondly, do these segments occur in all positions, specifically word-initial, intervocalic and word-final? And finally, what happens when segments of different input or underlying voice quality are adjacent, i.e. occur in clusters?[2] As will be shown below, the three languages in question demonstrate contrary but complementary phonological behaviors.

The dialects of northern Dutch - those spoken in the regions north of the great rivers - follow three distinct patterns with regard to obstruent voicing. These patterns affect occlusives or stops ([k], [t], [d], [p], [b]), as well as fricatives ([f], [v], [s], [z], [ɣ]. Final devoicing is a common phonological process occurring in German, Russian and Polish, among other languages; this provides for obstruent devoicing in all word-final positions, as shown in table (1) below. Otherwise, Dutch has a nearly symmetrical set of voiced and voiceless obstruents in other phonotactic environments, specifically in word-initial and intervocalic positions. Exceptions to this symmetry are noted in the lack of a voiced velar [g] and in the particular distribution of [ʃ]; there are also constraints on the type of vowel preceding voiced and voiceless intervocalic obstruents (Booij 1995). Examples of the complementary distribution of contrasting obstruents are given in (2).

(1) Word-final devoicing: all final obstruents devoice
raad ("council") [ra:t] but *raden* → [ra:də]
krab ("scratch") [krɑp] but *krabben* → [krɑbə]
laaf ("refresh-1S") [la:f] but *laven* → [la:və]

(2) Positional contrasts between voiced and voiceless obstruents
a. word-initial
taal ("language) [ta:l] : *daalder* ("2½ guilders") [da:ldər]
paal("stake") [pa:l] : *baal* ("sack") [ba:l]
zaai ("sow-1S") [za:j] : *saai* ("dull") [sa:j]
fier ("proud") [fir] : *vier* ("four") [vir]
b. inter-vocalic
zitten ("sit-INF") [zɪtə] : *bidden* ("pray-INF") [bɪdə]
hopen ("hope-INF") [hopə] : *hobbelen* ("jolt-INF") [hɔbələ]
lessen ("lesson-PL") [lɛsə] : *lezen* ("read-INF") [lezə]
gaffel ("fork") [ɣɑfəl] : *gave* ("gift") [ɣa:və]

Across phonological word boundaries, such as those at the junction of a root word and an affix or between elements of a compound word, the neutralization of voice contrasts is also a general rule. This is accomplished by two different patterns, regressive and progressive assimilation. Assimilation refers to the feature or property of one segment spreading to an adjacent segment. The former pat-

tern involves the spread of the voice feature of the second segment to the preceding one; the latter pattern implies the spread of the first segment onto the second (Booij 1995: 58-61). Examples of both patterns are provided in (3).

(3) Voice assimilation
a. Regressive
opdruk ("imprint") /ɔp + drʏk/ → [ɔbdrʏk]
eetbaar ("edible") /et + ba:r/ → [edba:r]
kookboek ("cookbook") /ko:k + buk/ → [ko:gbuk]
afbellen ("decline by phone") /ɑf + bɛlə/ → [ɑvbɛlə]
b. Progressive
opvallend ("remarkable") /ɔp + vɑlənt/ → [ɔpfɑlənt]
zoutvat ("salt tub") /zaut + vɑt/ → [zautfɑt]
dakvenster ("dormer", lit. "roof window") /dɑk + vɛnstər/ → [dɑkfɛnstər]
afval ("waste") /ɑf + vɑl/ → [ɑf:ɑl]
waszak ("laundry bag") /wɑs + zɑk/ → [wɑs:ɑk]

However, the traditional analysis of assimilation as being linear, i.e. progressive or regressive, fails to capture a number of generalizations with regard to larger phonological processes, regardless of the directionality implied in these processes. Examining the constituents of assimilation, rather than the direction, allows a number of generalizations. Whenever the onset of the second phonological word (PW, morpheme, element of a compound word) is a stop, the underlying voice representation of that stop is preserved, regardless of any assumed derivational rule ordering. Also continuant obstruents will devoice unless they are in such a cluster, i.e. one involving a PW-initial voiced stop. These observations hint at a larger phonological process in Dutch - as well as other languages - in which fricatives show a tendency towards voicelessness. Because final obstruents, including PW-final obstruents, devoice unless these are followed by a voiced occlusive, fricatives promote only regressive assimilation; in essence, fricatives may only catalyze devoicing in obstruent clusters, whereas stops may catalyze both voicing and devoicing.

Afrikaans

Afrikaans possesses an inventory of voiced and voiceless occlusives and fricatives closely resembling those of Dutch. The distribution of these is relatively distinct, however, as Afrikaans lacks [z] and [ʏ] in word-initial environments (the former occurring only in a handful of loanwords, the latter as the result of intervocalic voicing or cluster voice assimilation, discussed below). Similar to Dutch, Afrikaans provides that all word-final obstruents should be devoiced, as in *hoed* ("hat" [hut]) or *raad* ("council" [ra:t]), the plurals of which are *hoede* [hudə] and *rade* [ra:də] (Combrink & de Stadler 1987: 102-103). Note that this also holds for fricatives, but not other continuant consonants such as [r] and [l] and glides of semi-vowels, and is sensitive to morphology (Lubbe & Zonneveld 1996).

Devoicing is restricted and operates neither in word-initial positions, nor in intervocalic, mor-

pheme-internal environments. In the latter environments, voiceless obstruents are regularly - although not obligatorily - voiced (see table 4 below); this generalized rule is partially obscured by orthographic rules and by the lack of intervocalic voicing in certain loanwords (e.g. *foto*; Combrink & de Stadler 1987: 77; de Stadler 1984). Intervocalic voicing may also be accompanied by assibilation of consonants other than [k]; this is a process by which an occlusive becomes a continuant, for example [t] and [d] become the flapped r [ɾ], while [p] and [b] become the fricative [v]. The reader will note that a voiceless continuant never occurs, even if the assumed input is voiceless, as this would result in a violation of the more general rule of intervocalic voicing (Combrink & de Stadler 1987: 75-78). Examples of occlusives in (4) show both the maintenance of contrast at onset and its loss in intervocalic environments, as well as the possible outcomes resulting from assibilation.

(4) Voice contrasts in Afrikaans
a. word-initial
pels ("fur") [pɛls] : *bel* ("bell") [bɛl]
teller ("counter") [tɛlər] : *deler* ("divider") [de:lər]
kees ("monkey") [ke:s] : *gees* ("spirit") [ge:s]
b. intervocalic, morpheme internal
stapel ("pile") [sta:bəl or [sta:vəl]
bottel ("bottle") [bɔdəl] or [bɔɾəl]
seker ("certain") [sɛgəɾ]
tabberd ("gown") [tɑbərt] or [tɑvərt]
bode ("messenger") [bo:də] or [bo:ɾə]

A second particularity of Afrikaans, especially when compared to Dutch, is the manner in which this language treats instances of obstruent clusters of the type seen in (3) above. As in Dutch, voice contrasts in occlusive clusters are not allowed. In opposition to Dutch, where assimilation may be progressive or regressive, only the latter is seen in Afrikaans (see 5 below); in a series of consonants C1 and C2, when C2 is voiced, C1 will also be voiced.[3] Essentially, assimilation in Afrikaans implies only voicing and never de-voicing, in opposition to Dutch.[4] Examples of this are provided in (5) below (Combrink and de Stadler 1987: 78; Wissing 1996).

(5) Cluster contrast resolution in Afrikaans
doopdiens ("baptism") /do:p + dins/ → [do:bdins]
sakdoek ("canvas bag") /sɑk + duk/ → [sɑgduk]
kruitbad ("mineral baths") /kryt + bɑt/ → [krydbɑt]
wasbak ("wash basin") /wɑs + bɑk/ → [wɑzbɑk]
afbreek ("demolish") /ɑf + bre:k/ → [ɑvbre:k]

Negerhollands

For the purpose of cross-linguistic phonological analysis, the most relevant Negerhollands data comes from Sabino (1990), who presents the phonological systems of some of this language's last

speakers. Rather than focus on the written word, often fraught with interference from Dutch or orthographic traditions (and having a detrimental effect on the study of voicing, in particular), her fieldwork looks specifically at the phonetics of sounds, as produced by these speakers. While largely impressionistic and empirically questionable (only five speakers were used), these descriptions point to the phonological propensities of Negerhollands in its waning years. Word-final devoicing would seem to have been a very productive phonological process in Negerhollands; Sabino indicates that this is not a strict rule, but a statistically-important tendency (1990: 189-91). The data in (6) - admittedly less symmetrical than the examples from Dutch and Afrikaans - are evidence of this process.

(6) Word-final devoicing in Negerhollands
bik or *big* ("belly") [bɪk]
lak or *lag* ("laugh") [lɑk]
pus or *puz* ("push") [pʊs]

Two distinctions with regard to word-final devoicing bear mention, albeit with a good deal of hesitation given the scarcity of phonetically and phonologically specific data, as well as the extinction of the language and the impossibility of such research in the future. Firstly, word-final devoicing in Negerhollands seems to have been systematized by analogy, to the extent that it may not be a question of voice neutralization in phonology, but of the prohibition of input voicing in written word-formation. In spite of examples given demonstrating final neutralization, Sabino's own inventory of consonants and her description of their distribution note that only one voiced obstruent is permitted in final position, [d]. Sprauve (1990) also provides for [m + b], [r + d] and [n + z] codas, although these are based on orthography and no mention is made of phonetic form. Statements about permissible word-final obstruents are largely based on dictionary citations and on empirical works based thereon, the phonetic accuracy of which should be viewed as suspect. Negerhollands also demonstrates a strong tendency toward syllable structure ending in a vowel or nasal, and nasals are unaffected by final devoicing in the languages we discuss here (Sabino 1990: 98). Given these observations, as well as what is known about biomechanics and the role of phonotactics in voicing (see section III below), one may posit with a fair degree of certainty that Negerhollands phonology provides for final devoicing of any word written with a final voiced consonant.[5]

The distribution of obstruents in other contexts provides a picture of the similarities between, especially, Negerhollands and Afrikaans. All consonants are permitted in word-initial positions, although consonants in intervocalic position, especially occlusives, show a marked propensity to undergo voicing (Sabino 1990: 188).[6] As with word-final devoicing, intervocalic voicing is partially borne out in the orthography of words, although examples are few and must therefore be viewed with caution. Fricatives, especially [v], would seem to be highly variable in all phonotactic contexts and are not presented in (7) below (Sabino 1990: 74 and 188, her Tables 5.3 and 8.15).

(7) Voice contrasts in Negerhollands
a. Word-initial
pat ("path") [pɑt] : *bak* ("bak") [bɑk]
te ("until") [te] : *dak* ("day") [dɑk]
kap ("cut") [kɑp] : *gat* ("hole") [gɑt]
b. Intervocalic
abidi ("out") [abidi]
fikiti or *figiti* ("fight") [figiti]

The final phonological process involving voice, namely cluster assimilation, is not operative in Negerhollands. Clusters involving obstruents are present only at the edge of words—typically in word-initial position - and never differ in voice; in all other instances, clusters are restricted to the sequence liquid ([r] or [l]) or nasal ([m], [n] or [ŋ]) plus a homorganic obstruent (Sabino 1990: 100-101).[7] In the case of word-edge obstruent clusters, Negerhollands provides for cluster resolution by secondary phonological processes, namely the deletion of initial [s] in [st], [sk] and [s + {k, t, p} + r] clusters (111-112) and vowel insertion (epenthesis) (106-108).

III. Discussion: phonetically-based phonological description of voice

A synthesis of the observations in the previous section is warranted before beginning discussion of the phonology underlying these data. One clear parallel we see between the three languages is the prohibition of, or strong preference against, voiced obstruents in word-final position. However, this surface similarity masks two distinct operations by which word-final devoicing is accomplished. Voicelessness in Dutch and Afrikaans is obtained by neutralization, the loss of voice specification; voicelessness in Negerhollands is sometimes obtained in this manner, but the paucity of written examples containing a word-final voiced obstruent suggests that this rule has been lexified to a great extent, that the lexicon of Negerhollands has superseded its phonology and final devoicing has become the rule directly at this level. Note that lexification of final voicelessness is also seen in Afrikaans, although this phenomenon is not as generalized as it is in Negerhollands.

The lack of cluster voice contrast is another similarity noted in all three languages in question; any combination of obstruents in any position in the word will share the same voice quality. Underlying this similarity, however, there is a great deal of difference with regard to the processes by which potential or actual contrasts are resolved. In the case of Dutch, cluster assimilation may be either regressive or progressive; the direction of assimilation is dependent upon the input specification of segments (occlusive vs. fricative, voiced vs. voiceless) and on syllable structure (onset vs. coda). Afrikaans provides only for regressive assimilation, mitigated in part by the apparent inviolability of word-final devoicing. Finally, Negerhollands completely avoids obstruent clusters that do not occur at the beginning or end of phonological words, and also provides for the lexification of edge cluster homogeneity. Negerhollands is perhaps more progressive than either of the other languages in its avoidance of clusters, providing for both vowel epenthesis and consonant elision as alternative solutions to illicit clusters.

One important difference between the languages is noted in the voice quality of intervocalic consonants (whereas the distribution of word-initial consonants is relatively unconstrained in all three languages). In Dutch, both voiced and voiceless obstruents may occur between vowels; in Afrikaans, voicing would seem to be the favored outcome for obstruents in this position, often implying spirantization as well; in Negerhollands, the few examples of intervocalic obstruents undergoing voicing and the relative lack of voiceless obstruents in these positions point to a similar process. It would seem that the mechanisms of passive voicing in intervocalic environments, as in clusters, have been expressed to a great degree in the Negerhollands lexicon, to the extent that there are few examples where a consonant between two vowels is specified as voiceless.

The ensemble of differences and similarities between the three languages are presented in (8) below. These synthesize the above discussion, looking at the principal tendencies evidenced by data in (1) through (7).

(8) A comparison of voice by position in Dutch, Afrikaans and Negerhollands

	Word-final	Intervocalic	Clusters
Dutch	no voiced obstruents neutralization	both voiced and voiceless obstruents	no contrast progressive & regressive assimilation
Afrikaans	no voiced obstruents neutralization	only voiced obstruents	no contrast regressive assimilation
Negerhollands	no voiced obstruents neutralization and lexicalization	voiced obstruents preferred	no contrast only at PW-edge epenthesis and elision

Given the differences in both form and the grammatical or derivational means by which these forms are obtained, a complete description of voicing must look beyond mere surface manifestations in order to obtain an explanation. Because phonological understanding of voice is inherently symmetrical and oppositional, it is also useful to recall the phonetic or physical correlates of both voicing and voicelessness.

The description of voice provided in this section is perhaps overly simplistic, masking the gradient nature of voicing, which is hardly binary and involves such crucial factors as onset time and transitions. In the phonology of a language (the grammar that provides rules or constraints on the combination of certain sounds), some segments are specified as being voiced, whereas others are specified for voicelessness; as seen in the data of section II above, the concatenation of sounds often results in modification of this original quality. With regard to the phonology of voice, or the systematization of oppositions between voiced and voiceless sounds in certain contexts, a distinction may be drawn between active and passive voicing.

Active voicing refers to the positive activation or control of the glottis, the ensemble of muscles controlling the larynx and, by definition, the position of glottal folds. There are a number of patterns

by which this may be accomplished, resulting in either the abduction (spreading) or adduction (closing) of the glottis (Hirose 1997: 125). In English and Dutch, as well as Negerhollands and Afrikaans, active voicing is part and parcel of linguistic production, as some sounds are voiced and others voiceless, irrespective of other factors influencing articulation. The reader need only consider the English pair *bat* [bæt] and *pat* [p^hæt] or the Dutch pair *baar* [ba:r] and *paar* [pa:r] to recall the importance of active voicing in these languages.

Passive voicing, on the other hand, describes a complex biomechanical operation whereby the status of the glottis is not obtained by positive muscle activation as such, but by a default to lower-cost articulatory configurations. This might result in an otherwise voiceless segment becoming voiced, or in a voiced segment devoicing, or in no change at all. Passive voicing is a response to systemic needs for low-cost articulatory patterns; *ceteris paribus*, the best way to accomplish a given performative task is by the avoidance of specific effort or, if it cannot be avoided, by its reduction (cf. Lindblom 1990, Hayes 1996, Kirchner 1998, Russell Webb MS).

Quite naturally, effort reduction and avoidance are mitigated by the need for perceptual salience, a contrary biomechanical principle that works to prevent confusion and promote the mapping of signal onto meaning. From a receptor's point of view, it is best to have a clear auditory signal that may be easily recognized and whose integration in a linguistic system does not produce significant instances of confusion or overlap (Steriade 2001 & 1997, Lindblom 1990). The tension between productive principles promoting effort avoidance and receptive principles promoting confusion avoidance is never fully resolved; it is expressed in the phonological grammars of all languages, albeit in distinct and varied patterns. As the present article constitutes a first glance at the question with regard to Dutch and Dutch-derived languages, full discussion of these foundational issues is omitted; the reader is referred to the cited works for more complete discussion.

Without entering into too much detail about the phonological theories implied in active and passive voicing, or the role of phonetic regularities in phonological grammars, several observations may be made concerning the production of obstruents in general. With regard to the articulatory ease of certain segments, it is noted that, *mutatis mutandis*, voicing will obtain in intervocalic environments. By avoiding the positive activation of glottal muscles during consonant production, as would be necessitated by the transition from adducted to abducted and back to adducted configurations, articulatory effort is avoided. Indeed, cross-linguistic evidence points to the naturalness of intervocalic obstruent voicing when unconstrained by other factors (Westbury & Keating 1986: 149-152, Kirchner 1998: 54-55). The reverse is true at the end of words, where voicelessness is the product of passive abduction of vocal folds. This is due in large part to an increase in sub-glottal pressure coordinated with the end of pulmonic egression (breathing out); *mutatis mutandis*, glottal folds will abduct in this environment, impeding voicing (Westbury & Keating 1986: 156-157, Kirchner 1998: 56-58). A final observation may be made with regard to voice contrasts in clusters, the avoidance of which is also an instance of effort avoidance or reduction. Eliminating active control of the glottis during a transition from abducted to adducted glottis, or the reverse, is also an instance of effort reduction, although this principle does not strictly speaking dictate which of the two possi-

ble patterns provides the best outcome.

However, languages are not as unconstrained as may be suggested by the above comments. Dutch, for instance, does not allow passive voicing in intervocalic environments. Clearly, there are instances where an obstruent must—or should—maintain a specified, input voice quality, regardless of articulatory effort and the price paid in this regard. The table in (8') below reformulates that of (8), distinguishing between active and passive voicing.

(8') Comparison of active and passive voicing in Dutch, Afrikaans and Negerhollands

	Word-final	Intervocalic	Clusters
Dutch	passive devoicing	active voicing	passive voicing/devoicing by assimilation
Afrikaans	passive devoicing	passive voicing strongly preferred	passive voicing by assimilation
Negerhollands	passive devoicing[8]	passive voicing preferred	n/a

Optimality Theory (Prince and Smolensky 1993; McCarthy and Prince 1995) conceives of phonological grammars as being an evaluative system of ranked, violable constraints; it thus differs from previous phonologies, where inviolable rules were strictly ordered and transformational in nature. The theory groups constraints into two primary families: faithfulness, promoting output correspondence to input specifications, and markedness, promoting output well-formedness according to specified principles. In the case of voicing, the respective constraints may be concisely expressed as ID(voice), "the voice quality of the input should be the voice quality of the output," and *EFFORT(glottis), "avoid effort, specifically with regard to the glottis" (Russell Webb MS, Kirchner 1998). Either or both constraints may be violated, but the optimal candidate will feature the fewest violations of the higher-ranking constraint. Constraint ranking is written out using the symbol >>, with higher ranking constraints written before lower ranking constraints in a left-dominant linear order. The table in (9) provides a brief synthesis of constraint interaction in the three languages. The reader will note that this is hardly a complete treatment of the issue, but only a description of the general tendencies of these languages' phonological grammars. For a more complete treatment of voicing and the role of markedness and faithfulness, in Dutch especially, the reader is referred to Lombardi 2001 & 1999, Grijzenhout 2001, and Jansen 2001.

(9) Basic faithfulness vs. markedness rankings for Dutch, Afrikaans and Negerhollands

	word-final	intervocalic	clusters
Dutch	*EFFORT >> ID(voice)	ID(voice) >> * EFFORT	ID(voice) >> * EFFORT
Afrikaans	*EFFORT >> ID(voice)	*EFFORT >> ID(voice) (strong preference)	*EFFORT, ID(voice)
Negerhollands	*EFFORT >> ID(voice)	*EFFORT >> ID(voice) (preference)	*EFFORT >> ID(voice)

In Afrikaans and Negerhollands, faithfulness plays a far less important role with respect to voice than in Dutch. A more complete treatment of the role of markedness and faithfulness, as well as the gradient nature of *EFFORT are certainly merited, however. What may be extrapolated from the brief discussion here is that both Afrikaans and Negerhollands show a greater degree of respect for principles promoting biomechanical efficiency than they do for those promoting input-output correspondence. As hinted in the above discussion, these languages also seem to have integrated these principles into a deeper structural level, that of the lexicon; this is especially true for Negerhollands.

IV. Conclusion

The author has purposely limited himself in this paper to a brief presentation of data relevant to voicing in Dutch and two derivative languages, Afrikaans and Negerhollands, as well as a preliminary analysis of the behaviors observed in these data. Discussion has shown that the three languages demonstrate a number of similarities and differences, but that these differences may be attributed to the interplay of biomechanical processes affecting all languages: the phonetic tension between articulatory and perceptual needs is reflected in the phonological tension between faithfulness and markedness. While hardly exhaustive, the present discussion suggests that faithfulness plays a less important role in the grammars of the two derivative codes than it does in that of Dutch. It has also been shown that this statement must be mitigated by lexical considerations.

The author has contented himself with the presentation of contrastive language data and the brief, perhaps overly simplistic description of the phonology underlying these data. Clearly, much work - both descriptive and explanatory - remains to be accomplished. Two research projects, one presently in press and one in preparation, will hopefully address the principal concerns evoked in this work. Firstly, intervocalic assibilation and voicing deserves special attention, especially with regard to Afrikaans, as the interplay of these processes and their effect on output cannot be ignored. Secondly, the role of faithfulness in the development of Creoles, as well as the issue of lexification, merit greater attention; focus on these issues will hopefully lead to better understanding of specific data, e.g. the relative lack of clustering and the multiple solutions to this in Negerhollands, as well as to a certain heuristic capability of phonological theories and models in general.

NOTES

[1] A Pidgin is commonly described as a Creole lacking functional breadth, i.e. whose use is restricted to specific domains, for instance inter-community commerce. The widely-used adage that a Creole constitutes a "Pidgin having native speakers" appears overly simplistic, although it does hint at an important difference between the two, namely that a Creole is typically used in a wide variety of functions and is learnt from birth.

[2] I do not address here the question of voice assimilation across word boundaries, for several reasons, not least the several important structural differences between Afrikaans and Negerhollands compared to Dutch. This remains an area to be investigated and will hopefully be the subject of subsequent publication.

[3] Because PW-internal clusters never maintain cluster contrast, the present discussion is limited to instances of PW-border clusters, i.e. morpheme and/or prosodic word concatenation. Note also that the absolute nature of word-final devoicing in the phonology of Afrikaans, as opposed to that of Dutch, removes the possibility of progressive voicing; in a series C1 – C2 such as described above, C1 will always be devoiced. Should C1 and C2 both be voiceless, then the rule for progressive voicing is vacuously satisfied.

[4] Wissing (1991) shows that the degree (Voice Onset Time) and regularity of regressive assimilation is in part determined by other factors, both linguistic (word-stress) and non-linguistic (sex and educational level of the speaker).

[5] This position is based on a phonologist's reading of Sabino 1990, as well as an understanding of the variability of voice quality and the difficulty of impressionistic analysis thereof. Responsibility for this assumption, as well as for the ramifications of its position for the explanation given here, are entirely my own.

[6] Intervocalic word-internal voicing in Negerhollands is mitigated to a great extent by the relative infrequency of multisyllabic words in this language; the degree to which voicing occurs across word boundaries will likely remain unknown, due to the unfortunate disappearance of the language.

[7] The clusters [ts] and tʃ], described as being permissible in coda and onset only, are considered affricates rather than true clusters.

[8] As observed in section II, the lexicon of Negerhollands contains very few words with word-final voiced obstruents.

REFERENCES

Booij, Geert. 1995. *The Phonology of Dutch*. Oxford: Oxford UP.

Chaudenson, Robert. 2001. *Creolization of Language and Culture*. London: Routledge.

Chaudenson, Robert. 1995. *Les Créoles*. Paris: PUF.

Combrink, J.G.H. & L.G. de Stadler. 1987. *Afrikaanse fonologie*. Johannesburg: Macmillan.

Grijzenhout, Janet. 2001. "Devoicing and voicing assimilation in German, English, and Dutch: a case of constraint interaction." *Constraints and Preferences*, Katarzyna Dziubalska-Kolaczyk (ed). Berlin: Mouton de Gruyter, 201-228.

Hayes, Bruce P. 1996. "Phonetically Driven Phonology: The Role of Optimality Theory and Inductive Grounding." Manuscript, Rutgers Optimality Archives 158-1196.

Hesseling, D. C. 1905. *Het Negerhollands der Deense Antillen.* Leiden: Sijthoff.

Hirose, Hajime. 1997. "Investigating the Physiology of Laryngeal Structures." *The Handbook of Phonetic Sciences,* William Hardcastle and John Laver (eds). London: Blackwell, 116-135.

Hjelmslev, Louis. 1938. "Relation de parenté des langues créoles." *Revue des Etudes Indo-Européennes* 1: 271-286.

Jansen, Wouter. 2001. "Phonetic voice and phonological assimilation in the Germanic languages." *Proceedings of the Chicago Linguistics Society* 37: 43-57.

Kirchner, Robert. 1998. *An Effort-Based Approach to Consonant Lenition.* Ph.D. Dissertation, University of California-Los Angeles.

Kleine, Christa de. 1997. "The verb phrase in Afrikaans: Evidence of Creolization?" *The Structure and Status of Pidgins and Creoles*, Arthur K. Spears & Donald Winford (eds). Amsterdam: Benjamins, 287-307.

Kloeke, Gesinus G. 1950. *Herkomst en groei van het Afrikaans.* Leiden: Leiden UP.

Lindblom, Bjorn. 1990. "Explaining phonetic variation: A sketch of the H&H theory." *Speech Production and Speech Modeling*, W. J. Hardcastle and A. Marchal (eds). Dordrecht: Kluwer, 403-439.

Lombardi, Linda. 2001. "Why Place and Voice are different: Constraint-specific alternations in Optimality Theory." *Segmental Phonology in Optimality Theory: Constraints and Representations,* Linda Lombardi (ed). Cambridge (UK): Cambridge University Press.

Lombardi, Linda. 1999. "Positional Faithfulness and Voicing Assimilation in Optimality Theory." *Natural Language and Linguistic Theory* 17,2: 267-302.

Lubbe, Johan & Wim Zonneveld. 1996. "Ontstemming of stemgewing – weer eens oor die v/f-wisseling in Afrikaans." *South African Journal of Linguistics* 14,4: 109-117.

McCarthy, John, and Alan Prince. 1995. "Faithfulness and reduplicative identity." *University of Massachusetts Occasional Papers in Linguistics 18: Papers in Optimality Theory*, 249-384. Amherst: GLSA, University of Massachusetts.

Nienaber, G.S. & Nienaber, P.J. 1941. *Die Geskiedenis van die Afrikaanse Beweging.* Pretoria: Van Shaik.

Prince, Alan and Paul Smolensky. 1993. "Optimality Theory: constraint interaction in generative grammar." Manuscript, Rutgers Optimality Archive 537-0802.

Russell Webb, Eric. 2003. "Voice alternation as passive lenition: /ʔ/ in French."*Linguistik Online* 18,1: 127-147.

Sabino, Robin. 1990. *Towards a phonology of Negerhollands: an analysis of phonological variation.* Ph.D. Dissertation, University of Pennsylvania.

Sprauve, Gilbert A. 1990. "Dutch Creole/English Creole distancing: historical and contemporary data considered." *International Journal of the Sociology of Language*, 85: 41-50.

Stadler, L.G. de. 1984. "Taalverskeidenheid: 'n bekendstelling." *Standpunt* 3: 54-56.

Steriade, Donca. 2001. "The Phonology of Perceptibility Effects: the P-map and its consequences for constraint organization." Manuscript, UCLA.

Steriade, Donca. 1997. "Phonetics in Phonology: The Case of Laryngeal Neutralization." Manuscript, UCLA.

Stein, Peter. 1985. "Die Anfänge der Verschriftung einer Kreolsprache: Das Negerhollands im 18. Jahrhundert." *Entstehung von Sprachen und Völkern*, P. Sture Ureland (ed). Tübingen: Niemeyer.

Stolz, Thomas. 1987. "Kreolistik und Germanistik: Niederländisch-basierte Sprachformen in Übersee." *Linguistische Berichte*, 110: 283-318.

Stolz, Thomas. 1986. "Language and History in the Former Danish Antilles: Non-linguistic Evidence for a Diachronic Description of the Negro-Dutch Language." *Publicaties van het Instituut voor Algemeene Taalwetenschap* 51: 103-122.

Westbury, John R. and Patricia Keating. 1986. "On the naturalness of stop consonant voicing." *Journal of Linguistics* 22: 145-166.

Wissing, Daan. 1996. "Regressiewe stemassimilasie in die Afrikaans van Tswana moedertaalsprekers." *South African Journal of Linguistics* 14,4: 150-153.

Wissing, Daan. 1991. "Regressiewe stemassimilatie in Afrikaans: ses hipotese eksperimenteel getoets." *South African Journal of Linguistics*, Supplement 11: 132-156.