

Sociophonetic Restrictions on Subphonemic Elements in Pirahã

D.L. Everett
São Paulo, Brasil

1. Introduction

The Pirahã language is spoken by approximately one hundred and ten individuals along the Maici river in the state of Amazonas, Brazil. The Pirahã are monolingual having had only sporadic contact with outsiders (traders, laborers, etc.) until the last ten years or so. Further, most of these outsiders ridicule the Pirahã language commonly referring to it as *fala de galinhas* 'chicken talk'. An especially frequent source of such ridicule is the visual effects produced by the two phonetic (allophonic) segments [j̃] and [b̃] (to be described below).

In this paper, we want to examine the rather interesting sociophonetic restrictions on [j̃] and [b̃] which result from this ridicule and to investigate a few of the implications of these restrictions for phonological theory. To begin, let us review briefly the notions 'phonemic' and 'subphonemic'.

2. Phonemic and Subphonemic

Traditionally, theories which attach psychological significance to the notion of phonemic or phonological segments have maintained something like the concept developed by Sapir. To Sapir, the phoneme was a basic segment of sound perceived by the native speaker as a discrete element rather than merely a point on a continuum of a particular articulatory or acoustic feature. In his terminology (Sapir, 1949), phonemes are as distinct from one another as 'poles' and 'clubs'. There is no halfway point at which a particular feature of 'clubness' disappears and a club becomes a pole. This is partially due to the fact that variations in the forms of phonemes in this theory, and to some degree generative phonology, are seen to be *subphonemic*, i.e. without psychological status. As Sapir said, '... what the naive speaker hears is not phonetic elements but phonemes.... It is exceedingly difficult, if not impossible, to teach a native to take account of purely mechanical phonetic variations which have no phonemic reality for him.' (ibid:23).

We want to establish here that, somewhat contrary to Sapir's statements, an entire segment of the population of the Pirahã has 'taken account' of certain phonetic variations due to contact with outsiders and that the social context may act as a 'filter' to eliminate socially unacceptable, sub-phonemic features.

In order to better understand the restriction within the phonological system of Pirahã, the major processes and features of this system are given below.

3. Major Phonological - Phonetic Features of Pirahã

Phonemes

Pirahã has ten segmental phonemes: /p/, /t/, /ʔ/, /b/, /g/, /s/, /h/, /i/, /a/, /o/ and two (register) tonemes, /' / 'high tone' and /` / 'low tone'.

Palatalization

/t/ and /s/ are realized as [tʃ] and [ʃ] respectively, when preceding /i/.

Nasalization

/b/ and /g/ are (optionally) realized as [m] and [n] respectively, following pause.

Reduction of constriction

/b/ and /g/ are (optionally) realized as the vibrants [b̃] and [ġ]. [b̃] varies with [b] in the environment, $\left\{ \begin{array}{l} /i/ \\ /a/ \end{array} \right\}$ -/o/ and [g] varies with [ġ] in /o/ - /i/.

4. Consonantal Tenseness (length)

In Grimes (1981), it is shown that voiceless consonants are longer than voiced consonants. In fact, a hierarchy of length exists in which voiceless stops are longest, followed by voiceless fricatives and, finally, by the voiced stops.

5. Male-Female Speech Distinctions

Phonetically, women's speech is marked by what might be described informally as a type of 'guttural posture' in which the walls of the pharynx are slightly constricted and occlusives are retracted in relation to their points of articulation in men's speech. Socially, women do not speak with outsiders, whereas men value acceptance by foreigners highly, even eliminating the 'offensive' phonetic segments [ġ] and [b̃] in their presence.

6. Description and Distribution of [ġ] and [b̃]

Let us examine more closely this elimination, or 'filtering out', of [ġ] and [b̃] in the presence of foreigners, beginning with an informal description of these segments.

[ġ] is produced with the tongue tip tapping the alveolar ridge continuing until it extends out of the mouth, with its sublaminal portion resting on the lower lip. In Everett (1982) I call this a (voiced) egressive apico-alveolar/sublamino-labial lateral flap. With regard to the present discussion, we should note that the visual impression resulting from the protrusion of the tongue tip from the mouth is quite strong.

[b̃] is a bilabial multiple vibrant (trill). The visual impression of this segment is also very unusual and quite obvious.

We have already described the phonetic distribution of [ġ] and [b̃] under 'reduction of constriction' above. As to their social distribution, as mentioned earlier, they do not appear in men's speech in the presence of foreigners. It is only as I have learned the Pirahã language and have been accepted by the Pirahã (they refer to me by the kinship terms *xàhàigí* 'brother' reserved exclusively for Pirahã) that I have observed these segments in men's speech. However, from the beginning of my fieldwork, I have observed these elements (indirectly) in women's speech. Pirahã men have subsequently explained to me that they only pronounce words 'in other ways' (i.e. use the variant forms [ġ] and [b̃] with me because I am 'one of them',

7. Questions

At first glance, at least four questions are raised by this pragmatic filtering of phonetic features. First, what is the relevant feature or conjunction of features which defines the class [ġ], [b̃]? Is this purely phonetic or should nonphonetic features be allowed? It seems that in men's speech a purely phonetic feature, e.g. [± vibrant], is not sufficient to account for the restrictions mentioned since no such restrictions exist on the same elements in women's speech. What must be recognized is that it is precisely the reactions produced in non Pirahã by these segments which causes Pirahã men to eliminate them. That is, their elimination is based on their 'strangeness' in relation to Portuguese. Using a familiar sociolinguistic term, we might label [ġ] and [b̃] [-superstrate] where 'superstrate' refers to segments possessed by the dominant (Brazilian) culture.

Such a decision raises another question. What then would be the nature of the relationship which obtains between the class of [-superstrate] elements and its environment? We can answer this simply by stating that in a [-familiar] environment (in which [-familiar] is a contextual feature), i.e. where foreigners are present, [-superstrate] elements are prohibited.

But granted this relationship between contextual features such as [± familiar] and sociophonetic classes described by the feature pair [± superstrate] the question remains of how to characterize the 'filter' or 'rule' involved. A likely answer is that something similar to the 'variable rules' of sociolinguistics is needed to represent the fact that once the speakers of Pirahã have been made aware of these subphonemic elements of their speech, they are able to *systematically* (cf. Everett, to appear) omit these features in

the presence of outsiders. Such control demonstrates the importance of ethnographic factors at all levels, even the supposedly psychologically 'unreal' phonetic level (to reverse Sapir's terminology).

The implications of these phenomena raise and partially answer a fourth question, namely, what might such sociolinguistic filters have to tell us about the nature of phonological change? Part of the answer is clear. Change at the phonological level cannot be considered exclusively as a function of random idiolectal variations but also stems from cross cultural context in which an entire segment of the population can in fact cede to social pressure and regulate or modify its language at any level accordingly. I am aware of no published example as clear on this as Pirahã.

References

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