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## In search of an explanation for sound change

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### Abstract

Based on Spanish data and the author's polysystemic model, this paper sets out to counteract the assertion of a number of distinguished phonologists that the explanation of sound change is an impossible enterprise. The importance of the analysis of tendencies within the three intrasyllabic systems is indicated and the long-term changes taking place in Caribbean Spanish are analyzed. In addition to offering adequate explanations of sound change, the author demonstrates the invalidity of some traditional theoretical positions such as the alleged Spanish tendency to the open syllable, the absolute character of both markedness and segmental strength and the naturalness of sound change in low-contact situations.

**Key words:** sound change, Spanish, polysystemicity.

## En búsqueda de una explicación del cambio fonético

### Resumen

Basado en datos del español y en el modelo polisistémico del autor, este trabajo se propone oponerse a la aserción de un gran número de distinguidos fonólogos de que la explicación del cambio fonético es una

empresa imposible. Se indica la importancia del análisis de **tendencias** dentro de los tres sistemas intrasilábicos y se analizan los cambios a largo plazo que tienen lugar en el español del Caribe. Además de ofrecer explicaciones adecuadas del cambio fonético, el autor demuestra la invalidez de algunas posiciones teóricas tradicionales, tales como la supuesta tendencia del español hacia la sílaba abierta, el carácter absoluto del mensaje y la fuerza segmental, y la naturalidad del cambio fonético en situaciones de bajo contacto.

**Palabras claves:** cambio fonético, español, polisistematicidad

Dedicated to language teachers,  
the unsung linguists...

The title of this paper indicates my belief that the explanation of sound change is not an impossible enterprise, as has been stated by some distinguished phonologists, ever since Roger Lass 1980. However, there are no grounds for expecting neat, water-tight accounts of *why* human beings change their sound systems. There is a measure of messiness to put up with brought about by the fact that behind every move there are competing motivations of differing degrees of importance: a not unexpected situation in studies of human behaviour. Multiple causation is a fact of life and our task is to uncover the different strands and determine their relative intensity.

It is perhaps convenient to state at this stage that the study of sound change begins at the beginning so to speak: one does not wait until the more or less irregular phonetic alternation becomes an accepted part of the system, or in the generative jargon "a regular phonological rule". In other words, the study of phonetic tendencies, for instance, is very important, not only for their intrinsic interest in the language under analysis, but also for what they reveal of universal, natural principles (for example, see Kenstowicz 1994, p.120).

The Spanish data I am going to discuss here reveal a drastic long-term change, which has been the result of diverse phonic events taking place within a period of four centuries. Such a change can best be explained by laying down some - presumably - fundamental principles. Firstly, phonology is *polysystemic* in the sense that phonic behaviour is determined to a very large extent by the existence, empirical,

actual and real (i.e. what is observed, what occurs and the causal mechanism which are transfactually operative)<sup>1</sup> of three systems within the *syllable*, which seems to be the crucial unit in the organization of speech: the prenuclear, the nuclear and the postnuclear systems, each of which has its own natural, unmarked set of phonic elements and events. The monosystemic approaches to phonology, while gaining in elegance and neatness, are no less than a straitjacket for a human product that is truly *multidimensional*; they sacrifice thus at the very least, part of the truth (see Chela-Flores 1987, p.74; 1995a, p.3).

Itkonen (1977) wrote of morphology as a self-maintaining system whose preferred state is represented by the principle of isomorphism (p.92). Is there a preferred state for phonology? Perhaps, and if we find out what it is, we can centre our search for the motivation of sound change around it. Going through the Spanish data on ongoing changes and comparing that situation with what is happening in some other languages, one detects a general tendency towards *maximum differentiation* realized as follows: a) the postnuclear and nuclear system tend to function together, with phonic events in the latter bringing it closer to the nucleus and prenuclear events drawing that system away from it, b) the maximally efficient realization of the marginal systems - with the obvious exception of the exclusively CV languages - is brought about then by their having opposite *articulatory states*. Because of their opposite reactions to the nucleus, there would seem to be a preference for attaining this differentiation in the following terms: the postnuclear events are determined by three general principles: backing, articulatory descent (including reduction of articulatory gestures) and gliding, all of which tend to move the consonantal margin towards the vowel. Events associated with the prenuclear systems are determined by the general principles of fronting and articulatory ascent (including an increment in the number of articulatory gestures), making this system less similar to the nuclear one.

It seems then, that an important factor behind the behaviour of consonantal systems - and therefore of the consonantal changes - lies in their opposite reactions to the nuclear system.

1 Bhaskar 1975, 1979, quoted by Pateman 1982.

The principle of maximum differentiation seems to be then a good possibility for representing the preferred state of the phonologies of at least some languages.

Let us look in detail at the facts of sound change in Caribbean Spanish in the light of the preceding statements. Spanish allows [+ANTERIOR, +CORONAL] segments in word-final position, i.e. /s, r, l, n, d/ and it adds /p, b, t, k, g, f/ in the syllable-final one; in other words, it allows 11 postnuclear phones, 9 of which are [+ANTERIOR]. These phones are being subjected to the following changes:

1. Velarization of all [+ANTERIOR, -CONTINUANT] segments
2. Loss of supraglottal gestures of /s/ and /ʃ/, i.e. the class of [+ANTERIOR, +CONTINUANT] segments
3. Loss of occlusion of /r, l/ both of which are [+ANTERIOR]

In fact, all [+ANTERIOR] phones are affected by the above changes, which represent a overwhelming *backing* move, leaving a set of minimal consonants, of which more later. The changes in detail are as follows:

1. The velarization of the [+ANTERIOR, -CONTINUANT] class affects the obstruents /p, b, t, d/ and the sonorants /n, l/. In the first group, /p, b, t/ occur only in syllable-final, whereas /d/ may also occur in word-final position. These four obstruents in syllable-final position become the velar obstruent [K], which is realized as a fricative in casual styles and a stop in formal styles.

capturar ---> [kapturár]; observar ---> [okserβár]

étnico ---> [ékniko]; administrar ---> [akministrár]

The velarization of /n/ has been well documented for word-final position, but only recent work (e.g. my 1978, 1980 papers) has reported its extension to syllable-final.

Examples such as [iɲnóβle] innoble, [kolóɲna] column, [iɲno] himno, etc. could be seen as the results of dissimilation, were it not for the presence of such a strong backing move covering practically every postnuclear segment.

The velarization of /l/ seems to be a more recent phenomenon and it may be linked to its loss of occlusion as we show below.

None of the cases of velarization seems to be subjected to stylistic fluctuations. The reason may be that these velars are not the object of corrective pressures and the perceptual difference is small. Preter Trudgill (1974) asserted that whenever minimal pairs were affected in sound change, the process would become vulnerable to stylistic variations (p. 103). However, in our case a significant number of minimal pairs is affected, e.g. [apitúsð] [ayitúð] 'aptitud, 'actitud; [aβsés]~[ayséso] 'absceso, 'acceso; [ápto]~[áyto] 'apto, 'acto etc, but no stylistic variation is appreciable in our data.

2. The loss of supraglottal gestures affects /s, f/, both being replaced by [h] the glottal fricative 'pasta' -->[páhta] 'difteria' -->[dihtería] (/f/ only occurs in syllable-final position), never in the word-final one.

This phenomenon also affects word-final /d/, which rather frequently among Venezuelans - as well as other Caribbean speakers - loses its supraglottal gestures, but is rescued from extinction by a glottal stop [pjeðá?] 'piedad', [berðá?] 'verdad'.

Although /s/ carries an important functional load, one only hears its sibilant realization in truly hyperarticulate styles. Men consider it an effeminate pronunciation or perhaps appropriate for the theater or the TV soap operas. Its functional load is carried by the glottal fricative of course, or in cases of elision by the lowering and/or lengthening of the preceding vowel. /f, d/ are practically free of stylistic variation.

3. The liquids /r, l/ frequently lose their apical contact, the vibrant adding aspiration [rh] as in [marhsjáL] 'marcial' or being replaced by [h] as in [káhne] 'came'<sup>2</sup>. The lateral which is

2. The fluid exchange between postnuclear /l/ and /r/ in Spanish - both in the American and European varieties - has been analysed elsewhere (Chela-Flores, G. 1955b, 1996). Alvarez 1994, in an important book on *Guajiro*, an Arawak language spoken in Venezuela and Colombia, interprets *rhotacism* in a manner that throws light on the nature of the same phenomenon in Spanish (see p.64 and ff.).

becoming increasingly velarized also loses its central contact as in 'ideal' [ideáL], 'fácil' [fásiL]

L= velarized dento-alveolar lateral

The events described in 1,2,3 result in the following realignments:

in **word-final position** where only /s, r, l, n, d / were allowed (i.e. [+ANTERIOR, +CORONAL] segments) native words (excluding borrowings such as *sandwich, smoking, frac, etc*), now we tend to find [η, h, L, ?] (i.e. [-ANTERIOR, -CORONAL]).

in **syllable-final position** where we had / p, b, t, d, s, f, r, l, n / now we tend to have [ K, h, L, η, ? ] K= velar obstruent. In fact, [K, h, L, η, ? ] can be considered as the set of **minimal consonants** of the postnuclear system (Chela-Flores 1986, p.28)<sup>3</sup>.

There are several remarkable aspects in these changes:

- a) There has been a clear move from anterior articulations to back ones and their polysystemicity seems evident: the backing (and gesture-reducing) processes are exclusively postnuclear and by the unified result they produce, one finds a relatedness that must be accounted for. Some of the backing processes have been around for a long time, perhaps over 400 years: letters written in Mexico by a Seville settler (circa 1560) provide evidence of the velarization of / n / and of the aspiration and occasional elision of /s/. In the letters and manuscripts of the leaders of our battles for independence from Spain in the early 1800's, we find spellings that point to the existence of the velar obstruent: 'cactar', 'acectar', etc. Velarized / l / and syllable-final velar / n / are more recent. Examples of some of these back phones are found in practically every variety of Spanish -American or

3 Lipski 1994 gives a detailed description of other varieties of Latin American Spanish, providing the basis for a useful comparison with the data offered here. For different theoretical approaches, see for example Zamora & Guitart 1988 or D'Introno et al 1995.

European - but what makes the Venezuelan - and Caribbean - situation so interesting is the intensity of the phenomenon and its extension to syllable-internal positions and to new segments.

The phonetic grounds of these changes are worth looking into. Back phones require the action of the extrinsic muscles of the tongue, a less complex operation than the articulation of the anterior phones they replace, because the latter require the use of the intrinsic muscles.

Harcastle 1976 states that "it may perhaps be possible to weight different parameters according to their place in a hierarchy of degrees of physiological delicacy required for their production ... this is already possible by regarding these parameters primarily involved in the activity of the extrinsic muscle system of the tongue as being less complex than those requiring contribution from both the extrinsic and intrinsic systems" (p.136). And most definitely, /s/ and /f/ are very complex consonants to produce, the former utilizing all seven lingual parameters indicated by Harcastle (p.100), with maximum delicacy both of muscular control and sensory feedback" (p.134) and the latter involving "maximal utilization of all labial articulatory parameters and minimal utilization of lingual parameters" (p.136)<sup>4</sup>. An additional factor is the difference in velum height between syllable-initial and syllable-final positions: muscles in the velar area tend to contract for the tenseness associated with the onset, whereas the relaxation of the postnuclear situation permits greater velum lowering, making the articulation of velar phones such as [ŋ] [K] more likely (see Fujimura & Lovins 1978, pp 110-111 for further details). There is no question that we are facing simplification of effort, i.e. *the principle of least effort*, but not in its traditional garb, because here it aims at attaining a maximization of the difference between the marginal systems.

- b) The general agreement among Hispanic linguists, not to speak of others, is that the general tendency of Spanish is towards the

4 On this aspect also see Laver 1994, pp. 244-245

open syllable, so that all phonetic simplification in the postnuclear system should be interpreted as a necessary stage on the way to phonetic zero. In this interpretation, of which I have also been guilty (Chela-Flores 1978, 1986), all postnuclear processes conspired to attain the open syllabic structure. We may have a *conspiracy*<sup>5</sup>, after all we have a number of phonetic changes taking place at different times in a period of over 400 years and whose results tend to be unified in a set of 5 minimal copeakers going to get rid of all postnuclear consonants? Perhaps never. As paradoxical as it may sound, a number of variable rules in Caribbean Spanish phonology seem rather stable" (p.9). There is nothing paradoxical about it, the speakers aim at keeping them !!!

Some phonologists, dazzled by Lass' rejection of teleological explanations have presented examples such as [séb?ba] 'selva', [móxka] 'mosca' to show there is no economy of effort in them, quite the contrary! However, if the primary objective of these changes is the maximum differentiation of the margins, the glottal stop and the replacement of the glottal fricative by the velar one insure the backness of the postnuclear position. The same applies to examples such as [piksína] 'piscina' and [atoríá?] 'autoridad' (Chela-Flores 1983, p. 493): the primary objective is not the open syllable.

- c) Velarization is replacing sonorant assimilation in the postnuclear system. Speakers tend to increase velarization in the more casual styles, assimilation rearing its head in the formal ones, although irregularly. This brings us to the question of the naturalness of the events. Each system has a set of phonic events associated with it, which may have at least some cross-linguistic validity. Anderson 1979 asked for a substantive typology of

5 Since its introduction in Kisseberth 1970, the notion of a "conspiracy" of phonological rules has been used with different degrees of success (see Chela-Flores, G. 1978, p. 297, for the first successful application to Spanish and also for other references in theoretical phonology), but its application here seems relevant. For a recent reference, see Kenstowicz 1994, p. 526.

processes as an auxiliary hypothesis to supplement the choice of formalism (pp. 29-30). I believe such a typology should have a polysystemic basis. Assimilation and velarization are both *unmarked* in the postnuclear system, but in this variety of Spanish the ongoing changes point to velarization as having a greater degree of naturalness, since it is replacing assimilation in the postnuclear system. This should cause no undue alarm: universal tendencies are not realized with equal intensity in all languages (some do not find expression in all stages of the history of a language); a local hierarchy of strength or productivity of the universal events is a supplement of a polysystemic approach to phonology.

- d) The notion of segmental strength is in need of a revision. Brasington 1982 rightly pointed out that the questions of strength and position have not been properly explored (p. 84); the strength of segments has been held to be constant, regardless of the environment. Strength scales should be posited for each system and I suggest that a postnuclear scale of strength may be as follows

1            2            3            4            5            6

STOP   FRICATIVE   NASAL   VIBRANT   LATERAL   GLIDE

The higher the number the stronger the segment, or in other words, the postnuclear segment grows in strength the closer its articulation resembles that of the nucleus. Thus to speak of segmental strength seems suspect, since strength is not inherent, but dependent on position, or in our terms pre-nuclear or post-nuclear. Furthermore, as our data and our approach indicate, *strength* and *weakness* should be explored along other parameters as well. The postnuclear, weakening, changes we have analyzed here have been changes in *place* of articulation, not *manner*<sup>6</sup>. The prenuclear, strengthening, changes - fewer in

6 The exception being /r/ → [h]. This change provides an additional - and hitherto, unnoticed - argument in favour of /r/ as [+CONTINUANT] in contrast to /l/, which never becomes a fricative. The position of traditional Spanish phonologists (for example, Quilis 1993, p.118) has

number - are changes of manner and only occasionally of place (e.g. delateralization of /ʎ/, assibilation of /t/, occlusivization of the fricative allophones of /b,d,g/, fricativization of /ʎ/ etc). Caribbean Spanish displays then, the following strategy in its changes: (1) the strengthening of the segments in the prenuclear system, producing a set of maximal consonants and the weakening of those in the postnuclear one, producing a set of *minimal consonants*. This is a universal tendency. (2) The strengthening is done through changes of *manner*, i.e. the general principle of ASCENT determines the shape of these prenuclear events. (3) The weakening is done through changes of *place*, i.e. the general principle of BACKING is the predominant force behind the postnuclear events.

A clear example of this strategy is provided by the ins and outs of palatals in the history of Caribbean Spanish. The *delateralization* mentioned before (known as *yeísmo* in Spanish) is a change of manner and occurs in the prenuclear position only. The only example of a postnuclear delateralization is the /l/ -- [r] change in some varieties (see note 2), being the most heavily stigmatized of all postnuclear changes, the same applying to the reverse process, *lambdacism*, /r/ -- [l]. Depalatalization is a postnuclear event that has two possible shapes, both the result of morphological changes. The orthographic ll alternates with non-palatal l in many words. For example: bello - beldad; doncella - doncel; ella - él

(Harris 1983, p. 50)

The lateral is depalatalized, i.e. a change of place in postnuclear position (and velarized by the far more recent lateral velarization already mentioned).

reñir - rencilla; desdeñar - desdén; doña - don

(Harris 1983, p. 53)

been to classify vibrants as non continuants. This position is not supported by the phonological behaviour of liquids (see Chela-Flores, G. forthcoming).

Again the nasal is depalatalized (i.e. a change of place) in postnuclear position (and velarized by the postnuclear nasal velarization already mentioned).

Another example of postnuclear depalatalization is provided by the phones [λ] and [ñ], products of lateral and nasal assimilations respectively. These two palatal phones are replaced by their velar counterparts. It seems safe to conclude that the notions of segmental strength and weakness are not absolute, but relative and should be redefined accordingly.

In the light of the data analyzed here, a reference must be made to Trudgill 1983 ("On Dialect", p.105): he offers a proposition concerning "natural" and "unnatural" changes in the sense that "in low-contact situations we might expect a slower rate of change; more 'natural' linguistic changes ... [whereas] in high-contact situations...we expect a faster rate of change; more 'non-natural changes..."

This statement may be valid in the areas examined by this well-known British linguist, but it certainly does not apply to the Caribbean Spanish area. This is an area of the world which qualifies as a high-contact situation and the sound changes it is undergoing have taken over four centuries to produce its maximum differentiation situation, or what may be its preferred state. Furthermore, these changes cannot be classified as non-natural either on phonetic or functional grounds.

I agree with Cairns and Feinstein 1982 when they state (p.194) that the goals of a theory of markedness are (i) to provide a formal account of substantive universals; (ii) to account for strong universal tendencies and (iii) to define the limits of possible linguistic variation (p.194). On the other hand, they and other phonologists, still seem to be dazzled by the formalistic obsession of generative - and *post-generative* - phonology and offer impressive and elegant formalisms, which are not much more than descriptive devices. Description, in whatever guise, is a useful first stage - sophisticated butterfly-collecting -, but it does not take us very far in the search for an explanation of sound change.

The interaction of phonetic and functional tendencies analyzed through a polysystemic approach -supplemented by a study of the sociolinguistic triggers - may offer a more down-to-earth, closer-to-the-speaker explanation.

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