

## [round] and [labial] in Spanish and the "free-form" syllable\*

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### Abstract

The present study investigates the relationship between labial consonants and rounded vowels, using data from Spanish. A closer look at the realizations of /f/ in a variety of Spanish dialects provides the backdrop for proposals concerning the interaction between round vowels and a variety of labial and labiodental obstruents. It is claimed that /p/, /b/, and labiodental /f/ are characterized by an exclusively consonantal feature such as [labial] and do not interact with a [round] specification found on rounded vowels. Certain labial continuants, such as [Φ], are characterized by the feature [round], which can therefore interact with [round] values of neighboring vowels. Possible interactions include delinking of [round] due to the action of the obligatory contour principle (e.g. [Φ] > [h]: fue > jue), as well as free reattachment of [round] to any phonological structure in which a possible segment of the language would result. In some Spanish dialects, [Φ], [h], and semivocalic [u] enter into a rich set of bidirectional equivalence patterns, including [Φ] > [h<sup>w</sup>] (café > cajué), and [h<sup>w</sup>] > [Φ] (Juan > Fan). In each set of forms the key syllables exhibit a SINGLE [round] specification, attached to a SINGLE syllabic position. The individual manifestations of the "one [round]" constraint result from the freely available option of attaching and detaching [round] in appropriate configurations. More generally, it is claimed that the breaking off of a terminal feature as a floating autosegment, and reattachment of this free autosegment to a neighboring segment, is a freely available option in ANY phonological system, providing that both the phonological structure from which the terminal feature has been detached and the floating feature itself can be relicensed in an appropriate configuration. The reattachment of the floating autosegment will produce a fully specified simple segment in case the feature structure to which the free autosegment attaches contains no previous specification for the class node in question. The reattached autosegment will produce a contour segment (diphthong, affricate, etc.), in case the structure to which the floating auto-

segment attaches already contains a feature specification for the class node in question. Synchronically, however, [round] is not underlyingly attached to ANY segment. Instead, a word such as Juan, which may emerge variously as [Φan] or [h<sup>w</sup>an], is represented as containing a single floating [round] autosegment, together with an underspecified voiceless fricative. This configuration permits [round] to attach either to the first segment, resulting in [Φan], or to the nuclear vowel, yielding [h<sup>w</sup>an]. In a sociolinguistic matrix in which a strong normative influence emanates from a prestige standard, the free optionality of variant pronunciations permitted by the floating autosegment runs contrary to the pressure to conform to a single standard. It is not coincidental that the floating autosegment analysis describes a number of sociolinguistically marginalized varieties of Spanish.

## Introduction

The theory of phonological distinctive features has undergone many reincarnations and revisions since the early proposals of such pioneers as Trubetzkoy, Jakobson, and Halle. Among the issues that continue to be debated are the binarity, monovalence, or polyvalence of features, the hierarchical dependencies among features (e.g. theories of feature “geometry”), the use of acoustic vs. articulatory cues for feature definition, the use of different feature systems for vowels and consonants, and the seemingly inescapable residue of contradictory, partially overlapping, and redundant feature specifications found in each framework. In the latter case, for example, phonologists continue to grapple with vocalic systems in which the specification [+high, +low] is theoretically possible and must be explicitly disallowed.

Straddling almost all the major theoretical issues of contemporary distinctive feature theory is the phonological relationship(s) among labial consonants such as [p], [Φ], and [f], labialized consonants such as [p<sup>w</sup>] and [k<sup>w</sup>], and round vowels such as [u] and [y]. That movement of the lips forms an essential part of the articulatory gestures for each sound is undisputed. Articulator-based theories of feature geometry (e.g. Sagey 1986; Ladefoged 1988; Halle 1988) acknowledge the activation of a labial articulator in all sounds involving lip rounding. Beyond this point, theoretical proposals diverge widely. Many phonologists feel uncomfortable with the apparent duplication of effort entailed by the use of, for example, [round] for vowels and [labial] for consonants, but phenomena such as the existence of “labialized labials” seem to require two separate features.

The present study investigates the relationship between labial consonants and rounded vowels, using data from Spanish. A closer look at the realizations of /f/ in a variety of Spanish dialects provides the back-

drop for proposals concerning the interaction between round vowels and a variety of labial and labiodental obstruents. It will be claimed that in the general case, /p/, /b/, and labiodental /f/ are characterized by an exclusively consonantal feature such as [labial] and do not interact with a [round] specification found on rounded vowels. Certain labial continuants, such as [Φ], are characterized by the feature [round], which can therefore interact with [round] values of neighboring vowels. Possible interactions include delinking of [round] due to the action of the obligatory contour principle (OCP), as well as free reattachment of [round] to any phonological structure in which a possible segment of the language would result. In some Spanish dialects, [Φ], [h], and semivocalic [u] enter into a rich set of bidirectional equivalence patterns, which is analyzed as the presence of a single floating [round] autosegment licensed by the syllable node and attaching to an appropriate structure in the onset or nucleus, subject to the constraint that [round] be attached to no more than a single segment in the syllable. The effects of these feature interactions can be seen both in contemporary Spanish dialects and in diachronic events that have shaped these same dialects. The following analysis of the Spanish syllable provides support for the notion that individual feature values are specifically licensed by syllabic structures. The study is organized as follows. Section 1 provides data on the pronunciation of /f/ and the interaction of /f/ and rounded vowels in a wide range of Spanish dialects. Section 2 analyzes the feature specifications characterizing rounded vowels and labial consonants. Section 3 provides an OCP-motivated account of the change /f/ > [h] before rounded vowels and semivowels. Section 4 uses the feature values proposed in section 2 to analyze the diachronic evolution of [Φ] to [h<sup>w</sup>] in a number of Spanish dialects. Section 5 is devoted to the synchronic alternation between [Φ] and [h<sup>w</sup>] in these same dialects. Section 6 provides further motivation for the notion of a free [round] autosegment. Section 7 attempts to correlate the Spanish data with the results of language contact. The discussion is summarized in section 8.

## 1. Realizations of /f/ in contemporary Spanish dialects

1.1. Standard treatises of Spanish pronunciation describe /f/ as a labiodental fricative. Several other variants exist, some representing large areas and others limited to isolated groups. Many dialects of Spanish realize /f/ as a bilabial fricative [Φ]; some researchers believe that this articulation is a carryover from the Ibero-Romance of Castille (cf. Lloyd 1987: 213; Torreblanca 1983). Currently, this pronunciation is receding in many urban areas, particularly among the upper socioeconomic strata, but it

is widely heard throughout Latin America and Spain. In dialects where /f/ is realized as [Φ], replacement by [h] (interpreted as a realization of the posterior fricative /x/) occurs commonly before syllabic and semivocalic /u/, and less commonly before /o/: *fue* > *jue* [h<sup>w</sup>e], *difunto* > *dijunto* [dihunto], *fondo* > *jondo* [hondo], etc. This pronunciation carries a socio-linguistic stigma and is avoided in educated speech.<sup>1</sup>

1.2. The interaction among “labial,” “rounded,” and “posterior” elements in Spanish takes on additional dimensions in a number of marginal dialects, in which drift, language contact, and the lack of a strongly enforced prestige standard combine to allow a large number of variant forms of individual words. One such change is the alternation between etymological /f/ and [h<sup>w</sup>] before UNROUNDED VOWELS (e.g. *familia* > *juamilia* [h<sup>w</sup>amilia]). In these same dialects, the opposite alternation also occurs, in which etymological [h<sup>w</sup>] (a realization of the posterior fricative /x/ plus semivocalic /u/) alternates with [Φ] before unrounded vowels: *Juan* > *Fan* [Φan]. The alternations in question occur precisely in dialects in which (1) /f/ is realized as [Φ], and (2) /x/ is realized as [h]. These observations provide the key to a comprehensive solution.

For purposes of the following exposition, data will be mainly drawn from a single dialect, that of the Peruvian Amazon, centered on the town of Iquitos (Castonguay 1987), although the alternations in question characterize a number of vernacular varieties of Spanish in which the above conditions hold. Representing the conversion of /xw/ [h<sup>w</sup>] to /f/ [Φ] are examples like (1):

- (1) Fan < Juan  
 Fana < Juana  
 Fane < Juane ‘regional dish made of rice or yucca with chicken or fish’  
 Faquín < Joaquín  
 febes < jueves  
 fego < \*juego < fuego  
 fera < \*juera < fuera  
 fez < juez  
 ficio < juicio

The opposite change, of /f/ [Φ] > /xw/ [h<sup>w</sup>] before unrounded vowels, is exemplified by (2):

- (2) juácil < fácil  
 juamilia < familia  
 juecha < fecha  
 jueliz < feliz

- jueo < feo  
 juijar < fijar  
 juilo < filo  
 juin < fin

The alternations shown in (1) and (2) are innovative within the framework of Spanish dialectology and are only found in a group of marginal dialects. Iquitos Spanish also demonstrates a set of alternations that are more widespread throughout vernacular Spanish worldwide. This involves the alternation of etymological /f/ [Φ] and /x/ [h] before ROUNDED vowels and semivowels, exemplified by (3):<sup>2</sup>

- (3) jormación < formación  
 jue < fue  
 juego < fuego  
 jumar < fumar  
 junción < función  
 jundido < fundido  
 juribundo < furibundo  
 jurioso < furioso  
 jusil < fusil  
 justán < fustán

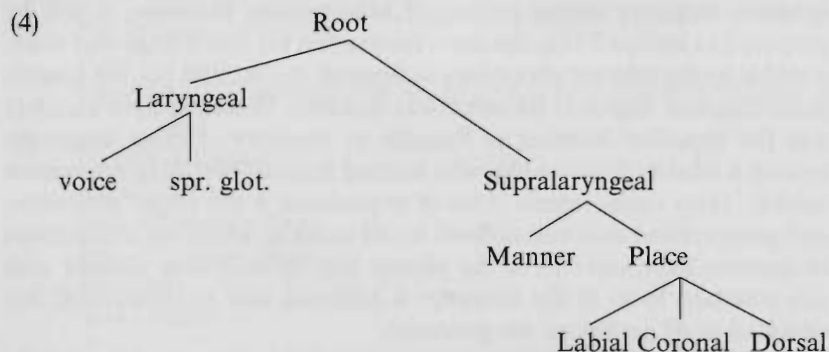
1.3. It is not coincidental that in all Spanish-speaking regions where the alternations in question occur, Spanish came into extensive contact with African and Native American languages and was frequently the recessive language during prolonged bilingualism. However, it will be proposed in section 7 that the main motivation for this change was made possible by the internal phonology of Spanish /f/, /x/, and /u/. No specific extra-Hispanic linguistic influence was involved. What did have an effect was the imperfect learning of Spanish by speakers of other languages lacking a bilabial fricative [Φ], who learned Spanish first from non-native models, often under duress. Also of importance is the social, economic, and geographical isolation suffered by all zones in which the alternations in question have survived to the present day. In each area, contact with any standard form of the language is minimal, and linguistic drift has operated in all sectors of the grammar.

## 2. The internal phonological structure of “round” and “labial” segments

2.1. One of the major achievements of contemporary phonological theory is the acknowledgement that phonological features are mutually

interdependent and are arrayed in hierarchical structures, whose topological particulars are reflected in processes that affect selected groups of features in an implicational fashion. This has given rise to theories of "feature geometry" (cf. Clements 1985, 1987; McCarthy 1988; Sagey 1986; Steriade 1987; Yip 1989; etc.), in which the distinctive features that compose a given phonological unit are hierarchically arranged and not merely grouped together as a "feature bundle" in which individual features are independent of one another and lack any internal structure. The concept of feature geometry can be immediately integrated with the theory of autosegmental phonology, so that individual nodes or terminal features on the geometric "tree" can operate on independent tiers. This theoretical integration has made possible elegant models of nonlocal harmony and has yielded the highly constrained claim that all phonological processes involving linking or delinking take place under strict adjacency, on some tier (cf. Archangeli and Pulleyblank 1987). In seeking to account for the various changes affecting Spanish /f/, /x/, and /u/, the intersection of feature geometry and autosegmental theory provides a promising avenue of approach.

2.2. There is far from a universal consensus on the precise geometrical structures underlying phonological units (McCarthy 1988 provides a good survey), or even on the universality of a single geometric model. The common denominators, however, are many, and for the purposes of the present discussion, a structure roughly like the following will provide the initial point of departure:



According to most versions of feature geometry, /f/ would contain a labial articulator as the sole dependent of the place node. The [+continuant] specification is, in most models, subordinated to a manner node, a sister of the place node and a dependent of the supralaryngeal node (but cf. Sagey 1986 for a model in which manner features are

dependents of the root node). No other articulator or feature specification is usually associated with /f/, although in those few languages in which bilabial and labiodental fricatives are distinguished, a feature such as [distributed] (e.g. Chomsky and Halle 1968: 314; Harris 1969: 198) or [strident] (suggested by a reviewer), presumably dependent on the active articulator, but conceivably dependent on the manner node, would come into play.

2.3. By way of commencing a revised analysis of Spanish "labial" and "round" elements, it is proposed that in the Spanish dialects in which /f/ is realized as [Φ], /f/ is specified as [round]. It is likely that the labial consonants /p/, /b/, and /m/ contain a bare labial articulator node, as suggested, for example, by Sagey (1986), while labialized consonants, [Φ], and round vowels contain a [round] specification dependent on the labial articulator node.<sup>3</sup> Bilabial [Φ] is characterized by a weak approximation of the lips, which, unlike [f], is not as readily classified as an obstruent. Lloyd (1987: 214) describes Spanish [Φ] as follows:

The combination of bilabiality with laxness means that the slightest relaxation of the lip position will in effect eliminate the lips as articulators, something which is especially likely to happen as the lips are not rigid. Thus, [Φ] before a vowel, pronounced with slightly more laxness, will result in a voiceless air stream followed by the vibration of the vocal cords required by the following vowel ... This type of development is more likely to occur with back vowels since the lip-rounding required in pronouncing them conflicts to some extent with the lip-spreading needed in articulating [Φ].

The [labial] articulation of /p/, /b/, and /m/ involves closure, and labial closure shows no affinity with neighboring vowels. A bilabial /f/ > [Φ], however, already shares the value [round] of rounded vowels and semivowels. A reanalysis of the alternations involving [Φ], [h], and [u] using these feature specifications will reveal the unified nature of the phenomena in the Spanish dialects under consideration. This demonstration will be done in two stages. First will come a reconstruction of the diachronic shifts that resulted in the reasonably stable replacement of etymological /f/ [Φ] by [h] in words that today show little alternation. This will be followed by a characterization of contemporary configurations in which bilateral alternation between equivalent forms is prevalent.

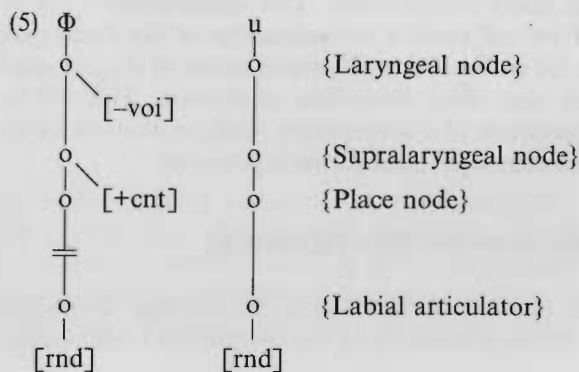
### 3. A diachronic analysis of the shift [Φ] > [h] before [u]

3.1. We consider first the shift of [Φ] to [h] before rounded vowels and semivowels as in (3), the most common of the alternations under discus-

sion. It is the SIMILARITY of adjacent [round] specifications that triggers the modification of /f/. This behavior reflects the modus operandi of the obligatory contour principle (OCP), which in broad terms disallows adjacent identical feature specifications, at an appropriately defined level of representation (cf. McCarthy 1986; Yip 1988). In the case of Spanish /f/ > [h] before rounded vowels, it is not sufficient to simply postulate OCP-induced delinking based on the presence of adjacent labial articulators. Spanish shows no other instances where adjacent articulator nodes trigger OCP-based phenomena. If this were the case, other labial consonants such as /p/, /b/, or /m/ should undergo some dissimilatory effect before rounded vowels.<sup>4</sup> What distinguishes the behavior of /f/ [Φ] from other "labial" consonants is the fact that [Φ] receives a [round] specification, which is lacking in the other labial consonants.

3.2. In the diachronic evolution of words like *jumar* < *fumar*, the OCP operated on configurations in which two [round] specifications appeared in immediate succession, delinking one of the [round] values. In principle, either of the [round] specifications can be delinked, provided that the remaining phonological structure can stand alone, or can be relinked to neighboring material in a natural, non-ad hoc manner. In those circumstances in which more than one solution is available, regional data from contemporary dialects show that multiple options have been freely exercised. When different OCP options are exercised in the synchronic grammar, considerable idiolectal variation arises, giving rise to configurations best characterized as containing an initially unlinked [round] autosegment. This matter will be pursued in later sections.

In the original configuration underlying /fu/, both segments contained a [round] specification, thereby triggering the OCP. The OCP delinked the [round] specification associated with [Φ], leaving behind a phonological structure specified as [+continuant] and [-voice], and attached to a consonantal root node:<sup>5</sup>

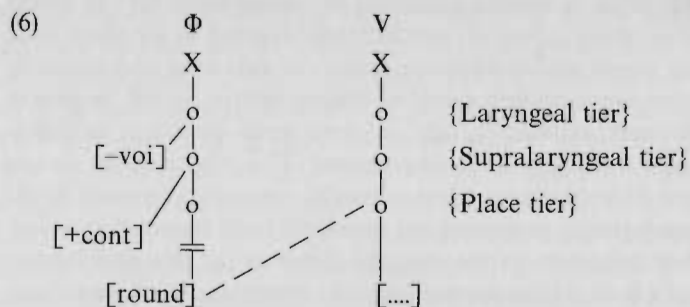


The resulting phonological material representing [Φ] received a phonetic realization as a voiceless continuant with no buccal articulator features, that is, as [h]. What is usually described as "semivocalic [u]" in words such as *fue* is in reality a [round] specification attached to the place node of a following vowel and is therefore subject to delinking and reattachment to another appropriately specified feature matrix, as will be seen in section 4. However, syllabic /u/ and /o/ were never altered in modifications involving a floating [round] autosegment. This is because the vowels in question are distinctively specified as [back]; removal of [round] would create a phonologically nonpermitted (nonlow) back unrounded vowel. This is the first indication of the interplay between the free attachment/detachment of a [round] autosegment and the requirements of phonological compatibility.

#### 4. A diachronic account of the bidirectional [Φ]/[h<sup>w</sup>] alternation

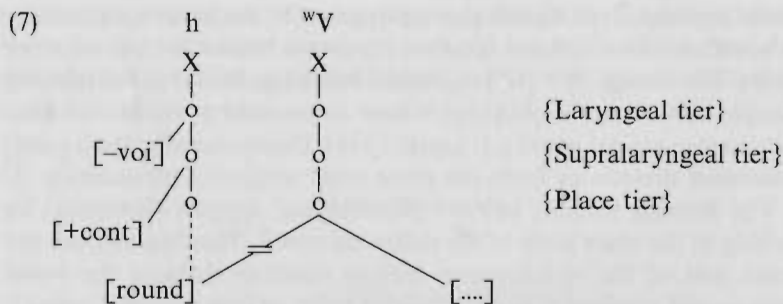
4.1. In configurations involving the diachronic interchange of [h<sup>w</sup>] and [Φ] before unrounded vowels, there is no [round] value originally associated with the vowel (nor can such a specification be added), so the issue becomes one of simultaneous versus successive ordering of [round] vis-à-vis the remaining [+continuant], [-voice] consonantal features. Consider first the evolution /f/ [Φ] > [h<sup>w</sup>], as in *familia* > *juamilia*. In this case, no OCP-induced phenomena are at work. In distributing the feature [round] across a temporally heterogeneous span, the change /f/ > [h<sup>w</sup>] is a form of DIPHTHONGIZATION, the branching of a feature creating a contour segment. True diphthongs (as opposed to the linear combination of a vowel and an unrelated semivowel) always branch for one or more features. The change /f/ > [h<sup>w</sup>] represents breaking, similar to the splitting of simple vowels into diphthongs whose component parts in turn may reduce to the original vowel (cf. Lipski 1974). Diachronically, the [round] specification dissociates from the place node originally representing /f/ [Φ]. The floating [round] receives phonological support (licensing) by attaching to the place node of the following vowel. This feature does not become part of the simultaneous feature structure defining the vowel (which would produce a nonpermissible front or low rounded vowel), but rather a branching structure. In Spanish, a branching [round] attached to the place node of a vowel is interpreted as semivocalic [w], whose tongue position is supplied by default rules defining possible on-glides. The segment underlying /f/, stripped of its place features but retaining enough phonological structure to define a permissible segment

(i.e. a voiceless glottal continuant), emerges as [h], in turn interpreted phonologically as /x/:



Auditorily, the resulting [h<sup>w</sup>] is no longer than the original [Φ], and there is no net gain in skeletal structure (no slot creation) to accommodate the [round] autosegment.<sup>6</sup> The nuclear vowel contains a branching place node, in effect forming a light diphthong.

4.2. The shift [h<sup>w</sup>] to [Φ] (e.g. *Juan* > *Fan*) is also limited to dialects in which (i) /f/ is realized as [Φ], (ii) the diphthongization of [Φ] to [h<sup>w</sup>] is common, and (iii) /x/ is realized as a glottal continuant [h]. In these dialects, the combination /xu + V/ as in *Juan* is phonologically interpreted as a single glottal continuant followed by a light diphthong, characterized by an adjoined [round] specification. Since [h] contains no terminal features attached to the place node, the [round] associated with the light diphthong can freely delink and attach to the place node of [h], resulting in [Φ] plus a simple vowel.<sup>7</sup>



## 5. Synchronic representation of [Φ]/[h<sup>w</sup>] variation

5.1. In considering the synchronic data displayed in (1)–(3) and the diachronic processes from which they result (schematized in [5]–[7]), it

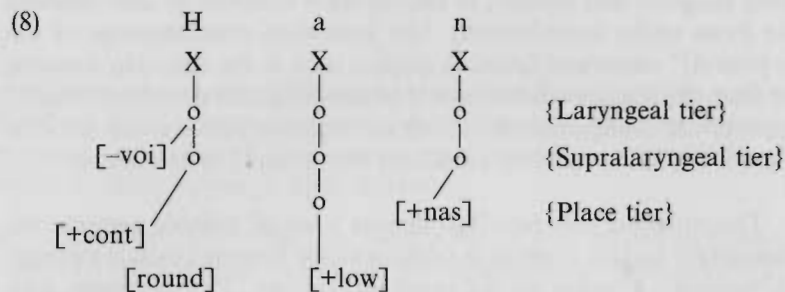
becomes apparent that in each set of forms the key syllables exhibit a SINGLE [round] specification, attached to a SINGLE syllabic position. This constraint operates over a number of permutations involving labial fricatives, semivowels, and vowels. Historically, a number of separate processes gave rise to a single synchronic configuration. The diachronic evolutionary patterns are clearly directional: (i) /f/, realized as [Φ], evolved the alternative pronunciation [h<sup>w</sup>] before unrounded vowels; (ii) /xu + V/, realized as [h<sup>w</sup> + V], developed the alternative pronunciation [Φ] in the same environments; (iii) /fu/, once realized as [Φu] or [Φ<sup>w</sup>], shifted to [hu] and [h<sup>w</sup>], respectively. Synchronically, however, nothing suggests that [round] is underlyingly attached to ANY segment in the items under consideration. The individual manifestations of the “one [round]” constraint found in dialects such as the Peruvian Amazon result from the freely available option of attaching and detaching [round] in appropriate configurations, as well as from the action of the OCP in configurations that originally contained two [round] specifications.

5.2. The situation just described defines a set of syllable patterns for contemporary Iquitos Spanish in which a single floating [round] autosegment variously attaches to the onset or nucleus. This contrasts with traditional descriptions of Spanish phonology (which continue to hold sway in dialects that do not exhibit the alternations [1]–[3]), in which, for example, /f/ is underlyingly specified as “labial,” /u/ as “round,” and so forth. In the approach being proposed here, a syllable in Iquitos Spanish either has a floating [round] autosegment associated with it, or it has no such specification. The details of attachment of [round] depend on a combination of possible phonological structures and free options, often giving rise to more than one superficial combination in representation of a single syllable.

This analysis draws support from the proposals of Goldsmith (1989, 1990) regarding syllabic licensing. In this approach, each syllable has two licensers: the syllabic node and the coda. According to the licensing criterion, “Each distinctive feature in a representation must be licensed by its closest licenser ... each licenser may license no more than one occurrence of each feature” (Goldsmith 1989: 148). Assumed here is a hierarchical arrangement of the syllable (e.g. Harris 1983), in which the syllable is divided into onset and rhyme, with the rhyme further subdivided into nucleus and coda. According to Goldsmith, the onset and the nucleus are jointly licensed by the syllable node, while the coda has a separate set of licensing criteria. This accounts for the fact that the [round] autosegment may attach to the onset or the nucleus, but never to the coda: a combination like *Juan* may become *Fan*, but never \**Jaun*;

*café* may become *cajué*, but never \**cajeu*, etc. In general, there is no interaction between consonants in the onset and vowels/semivowels in the nucleus, because consonants and vowels in the general case make use of different articulators and therefore different terminal features. The data under study represent an exceptional case, involving rounded vowels and labial consonants, where a labial articulator is activated in both types of segments.

In the present analysis, a word such as *Juan*, which in Iquitos Spanish may emerge variously as [Φan] or [h<sup>w</sup>an], is represented as follows, using *H* to represent the underspecified voiceless continuant:<sup>8</sup>



5.3. Words that etymologically began with /f/, such as *familia*, but in contemporary Iquitos Spanish can be realized with initial [Φ] or [h<sup>w</sup>] receive an analysis similar to (8), in which a floating [round] autosegment is associated with the initial syllable. The configuration provides for [round] to attach either to the first segment, resulting in [Φa], or to the nuclear vowel, yielding [h<sup>w</sup>a]. In these same dialects, a word like *fue*, realized variably as [h<sup>w</sup>e] or [Φe] (but never as [Φ<sup>w</sup>e]), would also be represented as in (8). In the synchronic analysis of these dialects, the OCP does not play a dynamic role, resulting in alternating forms, but rather operates as a passive constraint, responsible for the limitation of one [round] value per syllable.

5.4. For those dialects in which the change /f/ [Φ] > [h] once occurred (and in which [Φ] and [h] may currently alternate) before syllabic or semivocalic /u/, but in which no alternation between [Φ] and [h<sup>w</sup>] as in (1) and (2) is found, [Φ] is still underlyingly specified as [round], and OCP effects still apply synchronically. The latter type of dialect is both more widespread and less “nonstandard”; in phonological terms, this dialect group preserves the original Spanish patterns, in which place features are underlyingly attached to individual segments. Dialects that exhibit alternations of the form (1)–(2) are innovative, having evolved

a type of syllable in which a place feature like [round] is a free autosegment associated not with individual segments but with the entire syllable node, acting as licenser.

A syllable containing a floating autosegment by definition embodies alternative pronunciations for large numbers of words. In a sociolinguistic matrix in which a strong normative influence emanates from a prestige standard, the type of free optionality of variant pronunciations permitted by the floating autosegment runs contrary to the pressure to conform to a single standard. It is not coincidental that the floating autosegment analysis appropriately describes a number of sociolinguistically marginalized varieties of Spanish, since it is precisely in such communities that a greater tolerance for *polimorfismo* is found.

## 6. Evolution of a free [round] autosegment as a phonological option

6.1. In impressionistic terms, bilabial /f/ = [Φ] contains two distinct components. One is a generic (voiceless) “fricative” specification, which in the absence of additional place-of-articulation features will emerge as an aspiration [h]. The other is a labial component, which in the absence of any consonantal features will define a semivowel [w]. Referring to [Φ], Toscano Mateus (1953: 83, note 1) observes that “Descompuesto este sonido, resulta *ju* (Xw): *j* por la aspiración y *u* por la labialidad.” What “causes” this breaking off of a place feature like [round], allowing it to behave as a free autosegment and reattach to another segment? I propose that any phonological system freely allows the following option: the breaking off of a terminal feature as a floating autosegment, and reattachment of this free autosegment to a neighboring segment. In practice, this option is constrained by the requirement that both the phonological structure from which the terminal feature has been detached and the floating feature itself be relicensed in an appropriate configuration. The reattachment of the floating autosegment will produce a fully specified simple segment just in case the feature structure to which the free autosegment attaches contains no previous specification for the class node in question. The reattached autosegment will produce a contour segment (diphthong, affricate, etc.), in case the structure to which the floating autosegment attaches already contains a feature specification for the class node in question. As indicated by the data surveyed above, this option can be utilized either diachronically, resulting in a permanent sound shift, or synchronically, resulting in bidirectional alternations that are constrained by extraphonological factors.

In the case of Spanish, this creates a very limited set of options, of

which the alternations exhibited in (1)–(3) are normally the only available instantiation. Thus for example if a free [round] autosegment associates to the underspecified matrix (lacking place features) representing [h], [round] attaches to the place node and [Φ] results. In contrast, if a floating [round] autosegment attaches to a (nonround) vowel, this is not a simple feature-filling process, since place features are already specified on the vowel. Spanish nonround vowels (/i/, /e/, and /a/) are [+low] and/or [–back], and Spanish allows no [+low] or [–back] rounded vowels. Thus, [round] can only attach to the place node of a following nonround vowel in a branching fashion, producing a light diphthong usually transcribed as [ʷV].

By the same token, only /f/ [Φ] can be the source of a floating [round] autosegment in Spanish, since detachment of [round] from [Φ] yields a geometric structure (specified [+continuant, –voice], etc.) that finds a ready phonetic interpretation, as [h]. The remaining labial consonants, all specified [–continuant], cannot shed their [round] value. Since Spanish has no default place of articulation value for consonants,<sup>9</sup> a [–continuant] element cannot completely lose its place features. If this happened, a glottal stop would result, which is not a possible segment in Spanish. Noncontinuants, including nasals and laterals, can only lose their terminal place features when these features can be supplied by another mechanism, such as linking to the place features of a following consonant (e.g. nasal and lateral assimilation). By the same token, Spanish round vowels /u/ and /o/ cannot lose their [round] specification, since a disallowed [+back] unrounded vowel would be the result. This explains why only bilabial [Φ] is a viable candidate for dislodging a [round] autosegment.

6.2. In general, [round] is the only feature in Spanish that can associate to both consonantal and vowel structures.<sup>10</sup> Features associated with the coronal articulator inherently define consonantal articulations (although some vowels may be characterized by a coronal node; cf. Hume 1994); if a feature such as [anterior] were to dislodge from a consonantal place node, it could not associate to a following vowel, because the coronal articulator is not activated during the production of vowels. This means that even a coronal fricative such as /s/ (or /θ/ in Peninsular dialects) cannot split in a fashion analogous to the splitting off of [round] from [Φ]. The [+continuant] specification for /s/ and /θ/ would ensure that the delinking of place features would result in [h]; this is what occurs during “aspiration” of Spanish sibilants, usually occurring in the syllabic rhyme but occasionally embracing intervocalic contexts (Goldsmith 1981;

Hualde 1989). However, features such as [anterior], which are dependent on the coronal articulator, cannot anchor to a following vowel.<sup>11</sup>

## 7. Feature splitting in a language contact environment

7.1. Returning to the original motivation for the change [Φ] > [h<sup>w</sup>], as well as the concomitant alternation with [h<sup>w</sup>] > [Φ], it has been claimed that the autosegmentalization of place features is independently permitted whenever the phonological unit “losing” the feature specification in question does not violate a phonological constraint, and provided that the floating feature can reassociate to a neighboring segment, in this specific case, to a following vowel.

In most Spanish dialects this option is not exercised, even when /f/ is realized as [Φ]; the only phenomenon found in most dialects with bilabial /f/ is delinking to [h] before rounded vowels and semivowels. The shifts [Φ] > [h<sup>w</sup>] and [h<sup>w</sup>] > [Φ] before nonrounded vowels are strongly correlated with extra-Hispanic language contact environments, both past and present. The alternations in question are found among Afro-mestizo communities in southeastern coastal Mexico (Aguirre Beltrán 1958). They also occur in Esmeraldas province in northwestern coastal Ecuador (cf. García 1982: 29), and in the Colombian Chocó (Flórez 1950; Montes Giraldo 1974; cf. also Flórez 1951: 182 for other Afro-Hispanic regions of Colombia), where the African presence was especially strong, and where other linguistic vestiges of earlier Afro-Hispanic language may still be found.<sup>12</sup> In all these zones, Native American languages have also come into contact with Spanish, thus potentially adding a further variable to the mix. In the Amazonian region of Peru, where the impact of Native American languages is extensive, the changes in question also occur frequently (Castonguay 1987; Erickson 1986; Escobar 1978; Mendoza 1976, 1978). They are also found in highland areas of Peru (e.g. Domínguez Condezo 1990: 44, 53; Mendoza 1976: 81–86), Ecuador (cf. Moya 1981: 286–287; Toscano Mateus 1953: 83–84), and Bolivia (Garland Bills, personal communication), among Quechua-Spanish bilinguals. In addition to the sociolinguistic marginality of the dialects in question and the lack of a well-defined prestige standard, the fact that Spanish was originally acquired non-natively in each region where the change [Φ] > [h<sup>w</sup>] is attested does not seem to be irrelevant. African slaves and maroons often did not have sufficient native-speaker models to acquire the full phonological, morphological, and syntactic structures of Spanish, as has been well documented in other work on Afro-Hispanic language past and present. Although labiodental /f/ is well represented



among many African and Native American languages, bilabial [Φ] is not.<sup>13</sup> Several African languages allow the sequence [h<sup>w</sup>], however (Welmers 1973: 56–57).<sup>14</sup> Among Native American languages in contact with Spanish, for example, in the Colombian Chocó, along the Ecuadoran coast, and in Andean and Amazonian Peru and Ecuador, [Φ] is similarly absent. Historically, Spanish /f/ has frequently been borrowed as [p] or, in Aymara, as [p<sup>h</sup>], with the aspiration combined with labiality representing an alternative resolution of the incompatible [labial] and [+continuant] specification of Spanish [Φ].

7.2. Diphthongization is one way of accommodating phonological borrowings that violate phonotactic constraints of the borrowing language. In one of the most detailed studies, Andersen (1972) analyzed many instances of such diphthongization, usually involving vowels, such as the borrowing of German [ü] as [yu] into French and English. The labiodental fricative [f] is widely found among West African languages, and yet Spanish [Φ] was not always interpreted as [f] among Africans in Spanish America. This suggests that the bilabial fricative found in the local vernacular Spanish was pronounced with such a small degree of approximation as to allow only the [round] specification to be salient in the perception of non-Spanish speakers. The geographical and sociolinguistic marginality of the regions in question is responsible for preserving and extending the diphthongized pronunciation and ultimately for creating an innovative syllable type in which [round] is a free autosegment. It is likely that similar diphthongized pronunciation of /f/ was found in other contact situations in the history of Spanish in Spain, Africa, and Latin America, only to disappear as normative tendencies reached previously marginal zones.

## 8. Summary and conclusions

The alternation between /f/ (realized as [Φ]) and [h<sup>w</sup>] in several Spanish dialects has been analyzed as part of a larger constellation of phenomena, involving the ability of the feature [round] to link to both consonants and vowels.<sup>15</sup> The changes under consideration are most common in dialects that have suffered prolonged isolation from normative linguistic influences, or in which Spanish was acquired as a second language under conditions of adversity and the lack of adequate native-speaker models. It is not necessary to postulate the specific influence of another language in this process, only the need to accommodate the bilabial fricative [Φ] of vernacular Spanish to languages lacking this element. As with many

other phonological modifications, it is at the nonstandard vernacular level, where normative influences are minimal and alternative phonological structures can be more freely chosen, that insights into the workings of the phonological component can be achieved. The series of changes involving “labial,” “rounded,” and “posterior” elements in Spanish results from the interaction of a freely available phonological option, diphthongization, a limited set of alternative phonological possibilities, and linguistic evolution unconstrained by conservative retention of the status quo. By expanding the phonological model to include reference to the internal structure of phonological units, and by admitting the operation of the obligatory contour principle combined with the free linking and delinking of a floating autosegment, a more comprehensive account is possible.

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## Notes

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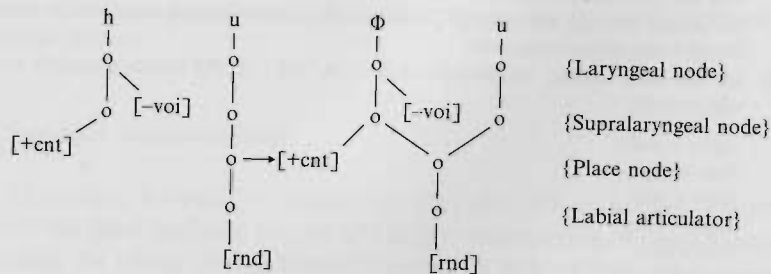
1. It is not possible to completely rule out the effects of analogy, since Old Spanish initial /f-/ passed through the stage [h-] (still found in some isolated nonstandard dialects) before being elided completely.
2. In this same dialect, hypocorrect shift of /x/ [h] > /f/ [Φ] before ROUNDED vowels also occurs:

fudio < judío  
fugo < jugo  
fulio < julio  
funio < junio  
furo < juro  
funta < junta

Finally, in a number of dialects in which the change [Φ] > [h] is common, this shift at times occurs in onset-initial clusters, particularly involving /fr-/ (e.g. *fruta* > *jruta*). This latter phenomenon falls outside the scope of the present inquiry and is best treated as simple weakening of [Φ].

3. See Goodman (1991) for a somewhat different set of proposals on the feature specification of labial consonants, labialized consonants, and round vowels. In the ensuing discussion, it will be assumed that terminal articulatory features are monovalent.

- However, nothing in the theoretical analysis hinges on this assumption. A precursor of the present proposal is embodied in the suggestions of Reighard (1972). The notion of a separate [round] specification is also adumbrated in the proposals of Campbell (1974), Anderson (1976), and others, in the form of a "complex symbol," containing sequentially ordered bundles of distinctive features. Clements (1991) analyzes labialized consonants as containing a [labial] specification on the vocalic place tier, subordinate to the consonantal place tier. He analyzes changes such as /χ<sup>w</sup>/ > [Φ] as complex segment simplification, in which the secondary articulation feature completely replaces the primary articulation feature (following "tier promotion").
- It is true that the change /b/ > /g/ occurs with greater than chance frequency in many nonstandard Spanish dialects, but the change /g/ > /b/ in the same environment is not unattested. Moreover, a similar change involving voiceless stops /p/ and /k/ does not occur.
  - This is similar to the analysis of the "aspiration" of syllable-final /s/ to [h] first proposed by Goldsmith (1981) (cf. also Hualde 1989). Recently, Bessell (1992) has proposed a similar structure for /h/ universally; however, Bessell (1992: 64) claims that "Segments lacking a primary place of articulation will not accept a secondary articulation," mentioning glottal [h] specifically. The Spanish data surveyed above do not support this assertion. Indeed, the Spanish data are not compatible with the notion that [h] is underlyingly just a [consonantal] root node with a daughter [continuant] specification.
  - That the rounded on-glide represented by attachment of [round] to a vocalic place node is not moraic is indicated by the interaction of the change [Φ] > [h<sup>w</sup>] with stress patterns. For example, in words with antepenultimate stress, Spanish does not permit a branching rhyme in the penultimate syllable (Harris 1983: 12). In dialects where the change [Φ] > [h<sup>w</sup>] occurs, however, this alternation freely occurs in the penultimate syllable of proparoxytones, as in *pífano* [pih<sup>w</sup>ano] (Moya 1981: 287), *ráfaga* [ráh<sup>w</sup>aga], etc., indicating that the nucleus of the penultimate vowel has not been lengthened.
  - Shifts of the sort [h] > [Φ] before rounded vowels (e.g. *junta* > *junta*) in a strict sense violate the requirement that [round] be attached to only a single element licensed by the syllable node, since in such items [round] is spread over the onset and the nucleus. There is still only one [round] specification, since what occurs is spreading of the place features from the /u/ to the unadorned place node underlying [h]:



This option is permitted by the constraints governing the attachment of [round] and in effect represents an alternative means of resolving the OCP prohibition of two identical adjacent specifications in words originally containing the sequence [Φu]. It is, however, a less preferred option, given that Spanish phonology does not ordinarily permit multiply linked features except when a given position does not license a feature, which must then be licensed by the following licenser (e.g. licensing of place features of nasals in the coda by the onset/syllable node of a following syllable).

- For purposes of exposition, [+nasal] is shown as associated with the supralaryngeal node, although nothing hinges on this attachment.
- Pace* advocates of "coronal underspecification," which finds no independent justification in Spanish.
- There is possibly another instance of feature splitting in Spanish. The posterior fricative usually represented as /x/ varies widely in articulation, ranging from a postvelar fricative [X] (in much of Spain), to a velar fricative [x], a palatalized fricative [ç] (most notably in Chile, but to a lesser degree in the rest of the Southern Cone), and a simple aspiration [h] (much of southern Spain, the Canary Islands, and much of Latin America). In the Southern Cone, "palatalization" of /x/ is most frequent before front vowels, with the extreme case being the Chilean pronunciation of *gente, mujer, imagine*, etc. In popular Chilean Spanish, the [ç] often breaks to a diphthong before /e/, roughly [h<sup>j</sup>]. Assuming that palatal phones in this region are characterized by the feature [+high], perhaps dependent on a dorsal articulator node or some other articulator shared by vowels and consonants (cf. Clements 1976 for some evidence that certain vocalic and consonantal features in the central part of the mouth are shared), the "diphthongization" of /x/ could be characterized as the splitting off of [+high], and its reassociation to a following vowel. Since in the appropriate contexts the next vowel will be [-back], an off-glide [j] or [i] will be heard.
- Breaking off of the place features is what occurs when intervocalic sibilants reduce to [h], a change that has become common in some nonstandard dialects in Central America, New Mexico, Spain, and Colombia. In such cases, it is not clear if splitting off of the place features followed by stray erasure is involved, or simply delinking of the supralaryngeal node.
- It might be surmised at first glimpse that a direct African or Amerindian substrate influence could be postulated, but this hypothesis encounters several obstacles. First and foremost, no attested examples of the change /f/ > [h<sup>w</sup>] are found in the large written corpus of Afro-Hispanic language, beginning in sixteenth-century Spain, and found in Latin America from the seventeenth century to the turn of the twentieth century. The Latin American corpus represents Cuba, Puerto Rico, the Dominican Republic, Panama, Venezuela, Colombia, Ecuador, Argentina, Uruguay, Mexico, and Peru, depicting the speech of Africans who learned Spanish only imperfectly as a second language (known as *bozales*). While the texts exhibit a wide variety of nonstandard phonetic modifications, no texts from contemporary Afro-Hispanic regions other than the Chocó and the Costa Chica of Mexico exhibit the change /f/ > [h<sup>w</sup>]. Another problem is the fact that no ready substrate model for the shift /f/ > [h<sup>w</sup>] exists among attested African languages carried to Latin America. The consonant /f/ is reasonably common among West African languages, usually with labiodental articulation; the bilabial fricative frequently found in Spanish is not a common variant in Africa. Voiceless velar fricative /x/ occurs occasionally, as does aspirate /h/. Some African languages do exhibit labialized consonants, but /f<sup>w</sup>/ is very rare, and /h<sup>w</sup>/ even rarer. No West African language has [h<sup>w</sup>] to the exclusion of [f], and no obvious case can be made for a direct transfer of African phonotactic patterns. The Amerindian languages in contact with Spanish in the areas mentioned above are as diverse as the African languages brought to Latin America, but in the case of the areas mentioned above, there appears to be no basis for assigning the change /f/ > [h<sup>w</sup>] to the direct interference of a Native American language. In other regions, precedents may exist; thus the Navajo adaption of Spanish *fuerte* is *Hwéèldi*, currently the name for Ft. Sumner (New Mexico), and the general word for 'court house'. The fact that this change occurs only

in areas where intense language contact was combined with isolation and marginality suggests that language contact phenomena cannot be totally dismissed.

13. See Welmers (1973: chapter 3). The voiced bilabial fricative [β] occurs more frequently, for example in Ewe.
14. Among the Gbe dialect cluster, which includes Ewe, [Φ] alternates with [h<sup>w</sup>] or [χ<sup>w</sup>] among cognate words. Capo (1991: 108–112; 1992) has proposed that Ewe bilabial fricatives derive from the corresponding velar + [w] combinations. See also Ohala and Lorentz (1977) for some similar examples. Ulrich (1991) gives examples from the Gur language Lama, in which all labial consonants except /f/ can be followed (morpheme-internally) by a rounded vowel; /f/ is realized as [h] in these environments, just as in the Spanish dialects under discussion. A partially similar case occurs in Japanese, where [h] is realized as [Φ] before [u], suggesting the spread of [round]. In borrowed words originally containing [f] before vowels other than [u], innovative Japanese varieties replace [f] by [Φ] (e.g. *feruto* < *felt*, *firumu* < *film*); in conservative varieties, however, some speakers use [Φu] before vowels other than [u], which suggests a partially dislodged [round] autosegment (cf. Vance 1987: 21; Bloch 1950). There is some evidence that [Φ] alternated with [h<sup>w</sup>] before [u], in earlier periods of the language (Martin 1987: 11–13).
15. There is an obvious similarity between the free feature combinations studied in the present analysis and the free combinatorial model of Archangeli and Pulleyblank (1994). This is not the appropriate forum to discuss the ramifications of such a finely grained theory. Suffice it to say that the present proposal appears to be an effective subset of Archangeli and Pulleyblank's model, in that the former allows for free recombination of features only under certain conditions, namely that the detached feature be accommodated by already existing feature geometric structure, while the matrix depleted by detachment still be a viable phonological segment, in accordance with universal and language-specific constraints.

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