"Toned-up" Spanish

Stress → pitch → tone(?) in Equatorial Guinea

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In Equatorial Guinea Spanish is in contact with lexical tone languages of the Bantu family. The present study, based on field data, compares naturalistic Guinean Spanish with the Spanish of from Madrid, the dialect zone that served as primary input for the formation of Guinean Spanish. A preliminary analysis reveals partial convergence of a pitch accent system and lexically specified phonological tones. Guinean Spanish maintains one stress per word culminativity but expands obligatoriness by realizing a pitch accent on every syllable lexically marked for stress. The rate at which pitch accents occur is compared with the distribution of High tones in the two most prominent Guinean languages (Bubi and Fang), and it is suggested that Guineans' incomplete suppression of natively acquired F0 patterns may be facilitated by the metrical structure of Spanish, which provides for regularly occurring pitch accents whose maximum potential density is similar to that of H tones in Bubi and Fang.

1. Introduction

1.1 Contact-induced intonation in Spanish varieties

In the study of intonational patterns across Spanish dialects, current or former language contacts have frequently been implicated—with varying degrees of empirical evidence—e.g. Italian for Buenos Aires (Colantoni and Gurlekian 2004), Quechua for highland Peru (O'Rourke 2004, 2005), Guaraní for Paraguay and northeastern Argentina (Malmberg 1950), Basque for northern Spain (Elordieta 2003, Elordieta and Calleja 2005), Catalan for Majorca (Simonet 2088, 2011), and Mayan for Yucatan Spanish (Barrera Vásquez 1980, Michnowicz and Barnes 2013). All of the aforementioned adstrate languages employ stress systems characterized among other factors by some type of pitch accent on metrically prominent syllables. Less attention has been directed at contacts between Spanish and lexical tone languages, such as occurred when several million speakers of African tone languages were involuntarily resettled in Spanish America. Tone-language adstratal influence has been suggested for

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the intonational patterns of some contemporary Afro-Hispanic dialects, e.g., Hualde and Schwegler (2008) for the Afro-Colombian creole language Palenquero, Morton (2005) for Palenquero Spanish, and Megenney (1982) for some Afro-Dominican communities.

Pitch accents in languages such as Spanish are often perceived by speakers of lexical tone languages as High tone, and borrowings from English, Portuguese, and French into African languages amply attest to this process (cf. Lipski 2005, chap. 7). This homology is most robust in citation forms; in connected speech, which constitutes the principal input in most language contact situations, matters are not as straightforward, particularly as regards the treatment of lexically unstressed syllables (e.g., Amayo 1980; Chen and Au 2004; Deterding 1994; Griper-Friedman 1990; Gut 2005; Gut and Milde 2002; Jowitt 2000; Kenstowicz 2006; Lim 2009; Wee 2008). The present study offers data from a contact environment involving Spanish and African lexical tone languages, in Equatorial Guinea. The study has the general goal of documenting in detail the behavior of Spanish as produced by native speakers of lexical tone languages, a linguistic configuration similar to that found in much of colonial Spanish America (although in quite different sociolinguistic environments). The principal research question is whether the contact between a pitch-accent/stress language and lexical tone languages has resulted in a hybrid prosodic system for Equatorial Guinean Spanish, possibly leading to the phonologization of Spanish pitch accents (i.e., as lexical tones).

1.2 The Spanish of Equatorial Guinea

The Republic of Equatorial Guinea, formerly the colony of Spanish Guinea and an independent nation since 1968, is the only African nation in which Spanish is the official language; nearly all Guineans possess usable fluency in the language of the former metropolitan power. Equatorial Guinea consists of the island of Bioko (formerly Fernando Poo), which contains the national capital, Malabo (formerly Santa Isabel), and the continental enclave of Rio Muni (with district capital Bata), between Gabon and Cameroon, as well as tiny Annobón Island, located to the south of São Tomé. Equatorial Guinea is home to a variety of languages. The indigenous group on Bioko speaks Bubi. Nearly all residents of Malabo and other cities on Bioko also speak Pidgin English, known locally as *pichinglis* or *pichi*. The principal ethnic group in Rio Muni is Fang; the Fang have also emigrated in large numbers to Bioko. Several smaller groups (Ndowé/Combe, Bujeba, Benga, Bapuko, etc.) are found along the coast of Rio Muni. Annobón Islanders speak *Fa d'ambú*, a Portuguese-lexified creole. The indigenous Equatorial Guinean languages are lexical tone languages of the Bantu family, in which all syllables are specified for either High or Low tone.

Descriptions of Equatorial Guinean Spanish are found in Bibang-Oyee (2002), Lipski (1985, 1990, 2000, 2004, 2008) and Quilis and Casado-Fresnillo (1995). Although spoken with varying degrees of fluency by most residents, Equatorial Guinean Spanish does have common traits found in nearly all speakers that justify the postulate of Guinean dialects of Spanish (e.g. Lipski 2008). Guinean Spanish at all levels of fluency can be immediately recognized, due not only to segmental and occasional morphosyntactic traits, but also to the unique intonational patterns, which depart significantly from those found in other varieties of Spanish. Castillo Barril (1966, 16) refers to "el tono de voz elevado […] una entonación ligeramente melosa, con el ritmo entrecortado y una variedad de tonos silábicos" [the raised tone of voice … a slightly syrupy intonation, with a choppy rhythm and a variety of syllabic tones]. The Guinean linguist Bibang Oyee (2002,19), himself a speaker of Fang, observes that "En un hablante fang, por ejemplo, se puede observar, en términos generales, que la configuración del fundamental se mantiene en los mismos niveles frecuenciales durante el enunciado, con desviaciones acusadas entre las sílabas tónicas y átonas" [In a speaker of Fang, for example, it can be observed that in general, the fundamental frequency remains level during an utterance, with notable differences between tonic and atonic syllables]. Bibang Oyee echoes the nearly exact words of his mentor Quilis (Quilis and Casado-Fresnillo 1995, 137–8).

Throughout its colonial history, native Spanish speakers in Equatorial Guinea came almost exclusively from Spain (except for a small number of exiled Cuban revolutionaries who arrived in the 1860s). Nearly all colonial administrators came from Castile and other northern areas. The educational system was largely in the hands of the Claretian (Corazón de María) religious order, based in Catalunya, although many of the priests and nuns also came from Castile as did lay teachers. Cacao, the principal colonial enterprise, was largely in the hands of landowners from Valencia. The segmental phonetic traits of central and northern Spain, as well as Catalunya and much of Valencia are quite similar, and are reflected in Guinean Spanish:

1.3 Tone languages and pitch accent/stress languages

A comprehensive definition of tone language as opposed e.g., to pitch-accent language is elusive (e.g. Odden 1999). Yip (2002, 1) classifies languages as tone languages "if the pitch of the word can change the meaning of the word," and "A language with tone is one in which an indication of pitch enters into the lexical realization of at least some morphemes." (ibid., 4) For Hyman (2009) a language has tone if "an indication of pitch enters into the lexical realization of at least some morphemes." For Gandour (2007, 4) tone languages exploit phonologically relevant variations in pitch at the syllable level. A tone language may exhibit a higher density of pitch fluctuations than languages lacking lexically specified tones (e.g., Gauthier, Shi, and Xu 2007). For

example Eady (1982) compared pitch patterns of Mandarin Chinese and American English. The speech of Mandarin subjects displayed a greater average rate of F0 change than English speakers: there were more peaks and valleys as a function of time and as a function of the number of syllables. This is consistent with the notion that F0 patterns are determined mainly by the tonal specifications of the specific lexical items in each sentence, while in English pitch peaks are normally restricted to the placement of primary stress in a predictable position and on only a few lexical items in each sentence.

A widely accepted definition of a language with stress is one in which there is an indication of word-level metrical structure meeting the following two core criteria (cf. Hyman 2006):

> OBLIGATORINESS: every lexical word has AT LEAST one syllable marked for the highest degree of metrical prominence (primary stress)
> CULMINATIVITY: every lexical word has AT MOST one syllable marked for the highest degree of metrical prominence

These two properties entail that every lexical word has ONE AND ONLY ONE primary stress. Yip (2002, 3) observes that in stress languages, what remains constant is the most prominent syllable in each morpheme, while the precise pitches associated with the prominent syllable may vary according to the embedding in a longer phrase as well as to the type of discourse (e.g., ironic, incredulous, exclamatory, doubtful, echo, etc.).

1.4 Correlates of stress in Spanish: Pitch accents

Although Spanish lexical stress has often been referred to as *acento de intensidad* 'intensity accent,' empirical research has shown that vocalic duration and rising pitch accent are the primary acoustic correlates of lexical stress, while relative intensity—including spectral tilt—is at best weakly correlated with lexical stress (e.g. Llisteri et al. 2002, 2003; Ortega-Llebaria 2006; Ortega-Llebaria and Prieto 2007; Ortega-Llebaria, Prieto, and Vanrell 2007). Spanish words may contain no more than one lexical stress; this includes prosodically stressed monosyllables such as the 2nd person singular subject pronoun *tú* 'you' as opposed to the possessive clitic *tu* 'your.' Spanish pitch accents have been extensively documented within the autosegmental-metrical ToBI framework (Beckman et al. 2002, Estebas-Vilaplana and Prieto 2008). There is considerable cross-dialectal variation in terms of the shape and alignment of both prenuclear and nuclear pitch accents, as well as the existence and typology of broad and narrow focus marking (cf. Sosa 1999, McGory and Díaz Campos 2002, and the articles in Prieto and Roseano 2010). Since the Spanish of Equatorial Guinea bears the strong imprint of Castile, especially Madrid, pitch accent patterns from this

variety are the most relevant. In the Spanish of Madrid prenuclear pitch accents in broad focus typically exhibit late peak alignment, i.e., the pitch rise reaches its peak in the immediately posttonic syllable (Estebas-Vilaplana and Prieto 2010; Face 2002b, 2006; Face and Prieto 2007; Prieto et al. 1995; also Henriksen 2012). In narrow-focus constructions, the high peak may be contained within the tonic syllable (Face 2001, 2002a). Rightward high peak displacement does not usually occur across word boundaries: early high peak alignment is the norm for words ending in tonic syllables (e.g., Hualde 2002, 104). Nuclear (phrase-final) pitch accents normally exhibit early (intra-syllable) peak alignment as well, although in non-emphatic speech there is frequently no discernible phrase-final pitch accent. Initial F0 pitch as well as overall pitch patterns may also depend on overall utterance length and the number of pitch accents (Prieto et al. 2006).

From an acoustic standpoint Spanish pitch accents are characterized by a fundamental frequency (F0) trough that signals the onset of the rise defining the pitch accent (Hualde 2002: 106; Prieto et al. 1995); there is usually also a pitch drop within the tonic syllable or the immediately following syllable. Pitch accent configurations observed in elicited laboratory speech bear only a partial resemblance to spontaneous speech, in which prenuclear accents exhibit a range of variability that cannot be entirely attributed to focus or emphasis (Face 2003). In the case of Equatorial Guinea, a reference to laboratory speech is not entirely irrelevant, since the bases for spoken Guinean Spanish were established principally by teachers and priests, whose declamatory didactic styles often come closer to laboratory-produced utterances than to everyday speech patterns.

2. Data collection

2.1 Participants

Data on the Spanish of Equatorial Guinea were obtained from ten female speakers and ten male speakers. Each gender group included five native speakers of Fang and five native speakers of Bubi. The age range was 25–47. None had resided outside of Equatorial Guinea, and all are sequential bilinguals who had acquired at least some of their Spanish in school. Most of the participants knew some Pidgin English, especially those residing in Malabo. As is typical in Equatorial Guinea, speakers typically use their native languages with interlocutors of the same language background and (particularly in Malabo) Pidgin English with Guineans of other language backgrounds. Spanish is spoken primarily with the small but prominent group of Spaniards and other "Europeans"; despite this relatively limited use all are fluent in Spanish, a characteristic of nearly all urban residents of this small country (Lipski 1985, Quilis and

Casado-Fresnillo 1995). The Fang speakers were interviewed in Malabo and Bata; the Bubi speakers were interviewed in Malabo, Rebola, Baney, and Luba, on the island of Bioko.

Baseline data for Bubi and Fang were obtained from two conversations recorded in Malabo, one between a male and a female Bubi speaker and the other between a male and female Fang speaker. Since the primary linguistic input for Equatorial Guinean Spanish came from central and northern Spain, Peninsular Spanish baseline data were obtained from two conversations recorded in Madrid among speakers born and raised in Madrid and its environs; one between two women and one among three men. In addition, one man and one woman from Madrid were recruited to read some of the sentences transcribed from the interviews with Guinean speakers and used in the following analyses. They were asked to speak the sentences as though they were part of a natural conversation, an obviously imperfect procedure that nonetheless provides a crude side-by-side comparison with the Guinean data.

2.2 Method

The Spanish interviews in Equatorial Guinea were conducted and recorded by the author. The format was free conversation on a variety of topics. The author also supervised the recording of the Fang and Bubi conversations, and recorded the conversations in Madrid. From each of the Guinean groups twenty complete utterances were selected at random, the criterion being that they were clearly recorded, contained a minimum of three stressable words, i.e., that could potentially receive a pitch accent (e.g., as per Harris 1983), and represented a grammatically complete sentence. All chosen utterances were declarative and none appeared to embody broad or contrastive focus. This yielded a total of 80 utterances. For the female speakers the number of potential pitch accents per utterance ranged from 3 to 9 with a mean of 5.2 (SD 1.9). For the male speakers the number of potential pitch accents per utterance ranged from 3 to 10, with a mean of 4.6 (SD 2.1). For a rudimentary comparison the male and female speakers from Madrid read the corresponding sentences as produced by Guineans. They were asked to render the transcribed utterances in as spontaneous a style as possible. Neither had listened to the Guinean recordings and both indicated that they had never heard Spanish spoken by Equatorial Guineans.

Using the same criteria applied to the Guinean recordings forty utterances each were extracted from the male and female Madrid conversations. For the female speakers from Madrid the mean number of potential pitch accents per utterance was 6 (SD 2.6) and for the male speakers the mean number of potential pitch accents per utterance was 7.3 (SD 2.3). For the Fang and Bubi baseline data a continuous sample

of five minutes was extracted for each language. All utterances were imported into PRAAT software (Boersma and Weenink 1999–2005) and manually segmented into syllables. All syllables capable of receiving stress in Spanish were marked on a separate tier.

3. Data analysis

3.1 Operationalizing pitch accents and H tones

Although Spanish pitch accents as well as Fang and Bubi H and L tones are relatively easy to discern aurally and to visually identify once pitch (F0) tracks have been matched to syllables, arriving at empirically replicable definitions (e.g., automated calculation) is fraught with difficulties (e.g., Ọdẹ́ḷọbí 2008; Quian, Lee, and Soong 2007; Yu 2010; Zhang and Hirose 2004). These challenges are compounded when faced with the diversity of utterances and speakers, particularly for the Spanish data. With this in mind, Spanish pitch accents were first identified manually by examining the F0 tracks aligned with potentially stressable syllables on the respective text grids. F0 minima on either side of tonic syllables were marked on the text grid at "elbows" followed by pitch rises, while F0 maxima were marked at the highest value of a rising F0 slope followed by a falling gesture (e.g., as in Henriksen 2012). A pitch accent was defined as the combination of an F0 valley either in the immediately preceding syllable (for non-initial syllables) or within the tonic syllable, followed by a F0 peak either within the tonic syllable or in the immediately following syllable. Previous studies have not specified the minimum F0 peak-valley difference necessary to define a pitch accent as opposed to subphonemic F0 fluctuations (e.g., due to segmental factors; cf. Hermes 2006: 32). Most research has relied on the premise that "stressed syllables in Spanish are generally accompanied by a rise in fundamental frequency" (Face 2002c, 77) combined with measurement of relevant F0 values in the vicinity of syllables assumed to be stressed. Such an approach implicitly assumes the obviousness of pitch accents, e.g., "visible pitch rises" (Simonet 2010, 126) and "F0 points presumed to represent tonal targets" (Henriksen 2012: 547), and works backwards by measuring pitch fluctuations on syllables previously identified as stressed. Since one of the goals of the present study was to measure the total number of F0 peaks that could be regarded as instantiations of a H tone, it was necessary to identify a F0 range independently from the designation of stressed syllables. In Prieto, van Santen and Hirschberg (1995, 447) the lowest average peak range for male Mexican speakers was around 30 Hz (also Prieto 1998, 268; Prieto et al. 1996: 452 report values as low as 3 Hz), while Face (2002c, 91) reports peak ranges as low as 19 Hz for a group of 5 male and 15 female speakers from Madrid. For the present project the conservative value of 30 Hz was adopted as the minimum F0

peak range for a tonic syllable that would qualify as a pitch accent (although in reality between these values and microfluctuations of 1–2 Hz the data contain almost no clear F0 peaks with smaller peak ranges). All tonic syllables that met these criteria were manually marked on the text grid as having a pitch accent. Early vs. late peak alignment in prenuclear pitch accents was judged binarily: either the F0 peak was located within the boundaries of the tonic syllable or it occurred in the immediately posttonic syllable.

Even less information is available regarding F0 ranges responsible for H and L tones in Bantu languages, which are characterized by such phenomena as downstep (contrastive lowering of H tones following each L tone) and downdrift (gradual F0 declination). As with Spanish pitch accents most research has relied on previous knowledge of the lexical tones associated with each syllable. For the three-tone (H, M, L) language Yoruba, Ọdẹ́lọ́bí (2008, 32) and Connell and Ladd (1990, 14) show value of around 20 Hz separating examplars of level tones in that language. In African languages with only H and L tones values in the 20–50 Hz range have been reported, e.g., for Chichewa (Myers 1998, 379), Ibibio (Connell 2002, 126), Igbo (Liberman et al. 1993), Kipare (Herman 1996), etc. In studying the effects of Mandarin tones on English, Eady (1982, 34) adopted a threshold of 15 Hz as defining a tonal fluctuation; this corresponds closely to the data on Mandarin tones provided by Xu (1999, 71) and Yu (2010, 4). For the Bubi baseline sample the average H-L pitch range for the male speakers was 41 Hz and for the female speaker 56 Hz; for Fang the average H-L pitch range was 39 Hz (male)/51 Hz (female).

Once the pitch accents had been manually annotated on the Spanish text grids, the number and alignment patterns were recalculated by means of a PRAAT script that identified local F0 maxima and minima in each utterance and on a syllable-by-syllable basis classified as a pitch accent a rise in F0 that met or exceeded the aforementioned ratios and were followed by a fall in the same or immediately following syllable. This approach is a simplified amalgam of techniques described in Alessandro and Mertens (1995), Bagshaw (1993), Hermes (2006), Scheffers (1988), and Taylor (1994, 2000), among others. Early aligned pitch accents were defined as containing the F0 peak within the tonic syllable while in pitch accents defined as late-aligned the F0 rises throughout the syllable and reaches its peak in the following syllable. In order to further compare Equatorial Guinean Spanish intonational patterns with Fang and Bubi, additional pitch excursions not associated with stressable syllables but meeting the 30 Hz criterion were also calculated. In the (few) instances where the script produced different results from the manual classification the author and a native Spanish speaker from Madrid re-examined the pitch track before making a final determination. For purposes of comparison the same 30 Hz script was applied to the Fang and Bubi baseline data (on text grids in which only individual syllables were marked), where the corresponding F0 peaks were taken to instantiate H tones. The results from the script

were compared with a visual inspection of the pitch tracks and appropriate corrections were made.

For each group of Spanish speakers the following were calculated: (1) ratio of possible stressed syllables to total number of syllables; (2) ratio of occurring pitch accents to total number of syllables; (3) ratio of occurring pitch accents to potentially stressable syllables; (4) ratio of all pitch accent-like F0 excursions to total number of syllables; (5) the mean number of syllables between F0 peaks (for both pitch accents aligned with stressable syllables and other relevant F0 peaks); (6) percentage of early-aligned prenuclear pitch accents. For the Fang and Bubi baseline data only the ratios of F0 peaks (H tones) to syllables and the mean number of syllables between F0 peaks were calculated, together with the percentage of early-aligned F0 peaks.

3.2 Results

Table 1 displays the behavior of pitch accents in the Spanish of Equatorial Guinea as compared with samples from Madrid. Since for both Equatorial Guinean and Madrid speakers' nuclear peak accents (when discernible) contained early-aligned F0 peaks, the data include both pre-nuclear and nuclear pitch accents. In this summary, words ending in tonic syllables are not calculated separately, on the premise that the proportion of such words is identical between the Spanish control and Guinean speakers and comparable among the Madrid conversational speakers.

This table shows that both male and female Guinean speakers produced pitch accents on a greater proportion of stressable Spanish syllables than speakers from Madrid, both when reading the same sentences as produced by Guineans and in spontaneous speech. These differences are systematic and significant. For the three groups of male speakers, a repeated measures ANOVA performed on the arcsine-transformed proportions of stressed to stressable syllables revealed a highly significant main effect for group: $F(2,97) = 219.9$, $p < .0001$. A post-hoc Tukey HSD test confirmed significant differences between male Guineans and the Madrid speaker's pronunciation of the same utterances ($p < .0001$) and between male Guineans and the conversation among male Madrid speakers ($p < .0001$), but not between the test subject from Madrid and the Madrid conversation participants ($p = .54$). These inter-group results were confirmed by Welch's t-tests: Guinea-Madrid reader: $t(55.99) = 18.56$, $p < .0001$; Guinea-Madrid conversation: $t(33.73) = 21.02$, $p < .0001$; Madrid reader-Madrid conversation: $t(57.35) = -1.07$, $p = .29$. For the three female categories, the ANOVA yielded a highly significant main effect for group: $F(2,97) = 25.34$, $p < .0001$. The Tukey HSD showed significant differences between female Guinean speakers and the female speaker who pronounced the same utterances ($p < .0001$) and between the female Guineans and the conversation among females in Madrid

Table 1. Pitch accents and F0 peaks in Equatorial Guinean and Madrid Spanish

	possible PA/syl	# syl between possible PA	occurring PA/syl	# syl between occurring PA	% occurring/ possible PA	% early aligned	all pitch peaks/syl	# syl between pitch peaks
Guinea-male	.34	2.9	.32	3.0	99%	89%	**.39**	**2.6**
Madrid-male	.34	2.9	.08	7.4	40%	5%	.20	5.0
Madrid-control-m.	.30	3.3	.13	7.5	44%	29%	.21	4.8
Guinea-female	.35	2.9	.31	3.3	90%	85%	**.34**	**2.9**
Madrid-female	.35	2.9	.24	4.5	68%	60%	.27	3.7
Madrid-control-f.	.31	3.2	.17	5.8	55%	27%	.18	5.5
Fang						98%	**.42**	**2.4**
Bubi						99%	**.38**	**2.6**

($p < .0001$). A barely significant difference was also found between the female speaker who read the Guinean utterances and the Madrid conversational data ($p = .03$). Welch's t-tests confirmed these results: Guinea-Madrid reader: $t(79.60) = 4.77$, $p < .0001$; Guinea-Madrid conversation: $t(43.64) = 8.52$, $p < .0001$; Madrid reader-Madrid conversation: $t(55.89) = 2.79$, $p = .008$. The female speaker from Madrid who read the transcribed Guinean utterances pronounced them in an exaggerated singsong intonation, despite the request to strive for a natural style; this greater intonational fluctuation is reflected in the significant difference with respect to the natural conversational data. It is probably the case that female Madrid speakers as a group exhibit more F0 fluctuations than corresponding groups of male speakers, but the data in Table 1 are skewed by the performance of the single female speaker who read the test utterances and cannot be taken as illustrative of more general tendencies. Figure 1 displays the relative proportion of pitch-accented syllables to potentially stressable syllables.

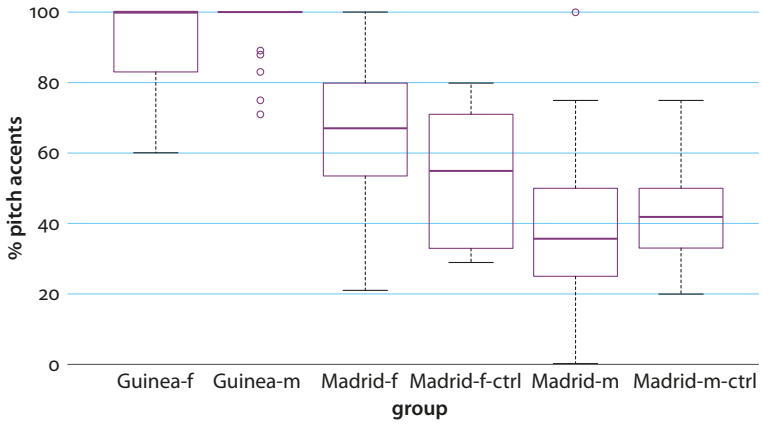

Figure 1. Proportion of pitch-accented Spanish syllables to potentially stressable syllables

Table 1 also shows that Guinean speakers early-aligned tonic pitch accents at much higher rates than the Spanish readers and Madrid conversation groups, all of which exhibited the Peninsular Spanish tendency towards late prenuclear peak alignment. Levels of significance in the proportions of early-aligned pitch accents precisely mirror the overall proportion of pitch accents: male and female Guinean speakers differed significantly from their Madrid counterparts with p-values < .0001, while there were no significant differences between the Spanish readers and the Madrid conversation groups. The relative proportions of early-aligned tonic syllables are displayed in Figure 2.

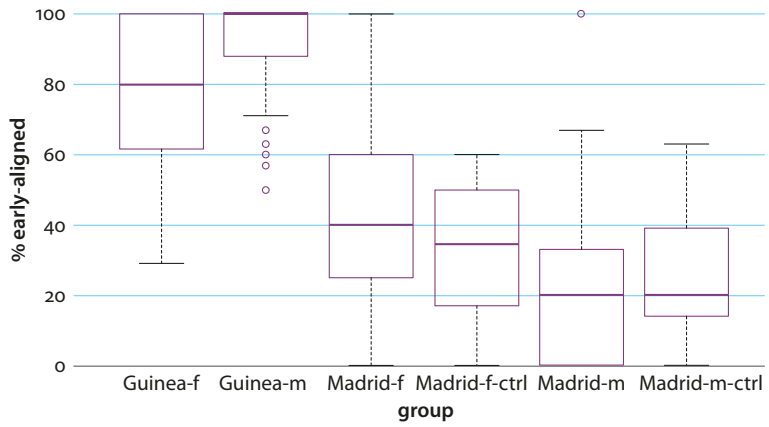

Figure 2. Proportion of Spanish early-aligned pitch accents on tonic syllables

To further illustrate the differences between Equatorial Guinean and Madrid Spanish intonation Figure 3 compares the pronunciation of a sentence by a female Bubi speaker (lower) and a female speaker from Madrid (upper). In addition to producing more pitch fluctuations than the Madrid female control group, this female Madrid speaker consistently produced late-aligned prenuclear pitch accents, as compared with the Guinean speaker's early-aligned F0 peaks. Figure 4 compares a male Bubi speaker (lower) with a male speaker from Madrid (upper); not only does the latter speaker produce late-aligned pitch accents but the inter-syllable F0 fluctuations are much smaller (both speakers had similar voice ranges).

4. Discussion

4.1 Early peak alignment in contact situations

The Spanish of Equatorial Guinea as produced by speakers of Bubi and Fang exhibits a much higher rate of early peak alignment in prenuclear syllables than (monolingual) Peninsular Spanish varieties. In many other bilingual contact environments involving Spanish, early peak alignment is also characteristic, including in varieties stemming from previous bilingualism (e.g. Colantoni and Gurlekian 2004 for Italian in Buenos Aires; Lipski 2014 for various Afro-Hispanic varieties in Latin America). Bullock (2009. 168–169) has observed that prenuclear peak alignment "appears to occur earlier in the speech of bilinguals than in monolinguals in a range of language pairings […]," while acknowledging that early peak alignment may have emerged as a default strategy rather than being a direct consequence of L1 transfer (169–170). In the case of Spanish in contact with Basque (Elordieta 2003; Elordieta and Calleja 2005), Quechua

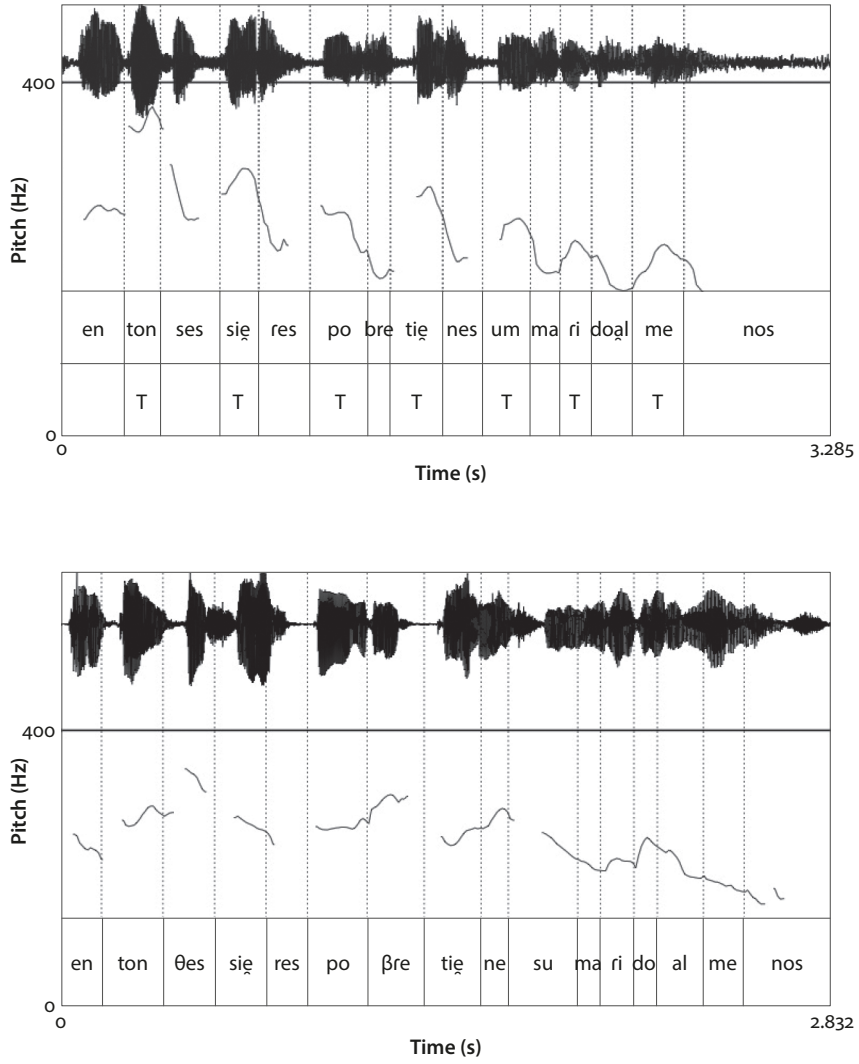

Figure 3. Female Guinean speaker (above) and female Madrid speaker (below); pitch track of *Entonces si eres pobre tienes un marido al menos* 'So if you're poor at least you have a husband.'

(O'Rourke 2004), and apparently many Italian varieties (Colantoni and Gurlekian 2004, 110), monolingual varieties of the languages in contact also exhibit early peak alignment, so direct prosodic transfer ranks high on the list of possible contributing factors. It is not clear why one pattern should prevail over the other, although prolonged Spanish-recessive bilingualism during the coalescence of a particular dialect may have been involved. Since in lexical tone languages, tones are generally aligned closely with their respective syllables, it is not unexpected that Spanish pitch accents

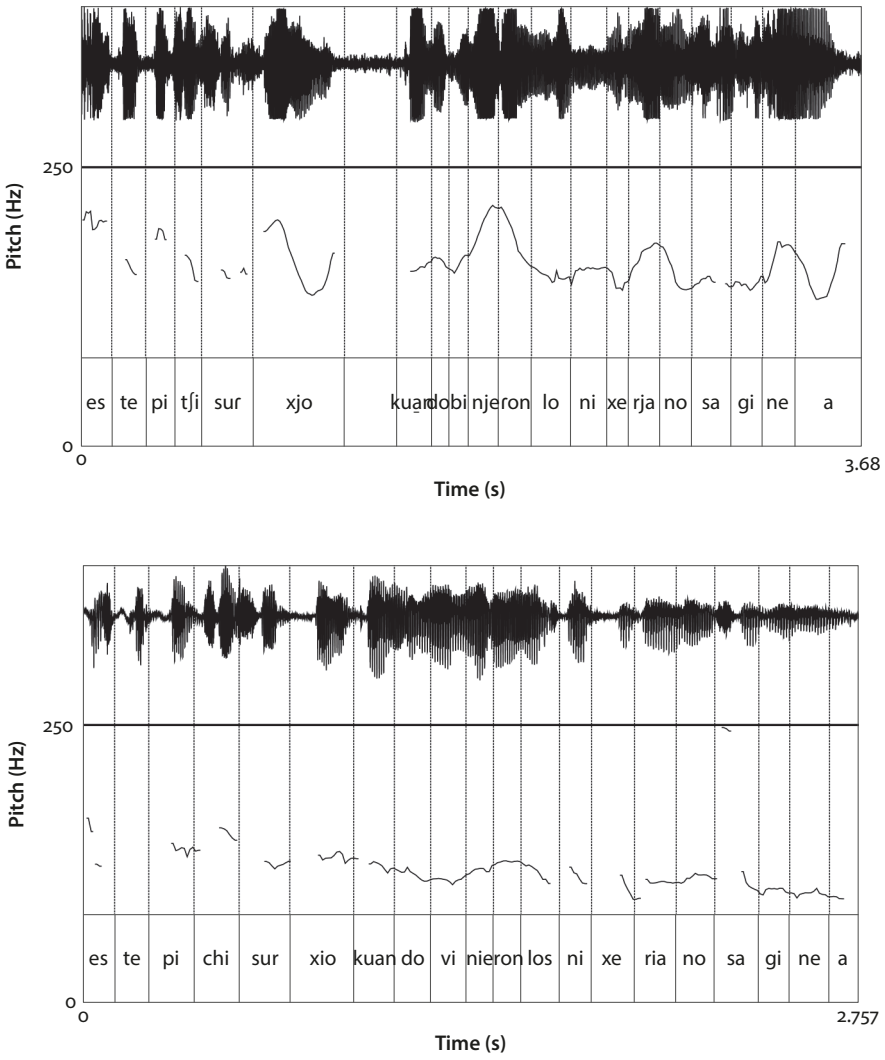

Figure 4. Male Guinean speaker (above) and Madrid speaker (below); pitch track of *Este pichi surgió cuando vinieron los nigerianos a Guinea* 'This *pichi* [Pidgin English] arose when Nigerians came to Guinea.'

(originally interpreted as H tones) would shift to an early-alignment configuration. Much the same appears to have occurred in the formation of Palenquero, which arose from contacts between colonial Spanish and Central African Bantu languages, most notably Kikongo (Hualde and Schwegler 2008). In Equatorial Guinean Spanish there is no ready explanation other than contact with lexical tone languages for the high proportion of early peak-aligned pretonic syllables combined with the comparatively

high ratio of pitch-accented to potentially stressable syllables. In particular there is no clear motivation for early peak alignment as a "default strategy" when the L2 input has robust late peak alignment. This, however, does not preclude additional contributing factors, especially in view of the complex sociolinguistic and language contact situation in Equatorial Guinea. The precise circumstances under which Spanish was acquired in Equatorial Guinea are unknown, e.g., the relative contributions of spontaneous speech and classroom instruction present in the input, and the extent to which the input included the Spanish of other L2 Guinean speakers as well as Spaniards.

4.2 Tonal crowding and peak alignment

In many languages, among them Spanish, pitch accents occurring in close succession results in tonal crowding, including leftward displacement of H peaks (D'Imperio 2001; Henricksen 2012), F0 undershooting (Face 2002c), raising of the inter-peak L tones (Prieto 1998; Prieto and Shih 1995), and in some instances the suppression of a pitch accent (e.g., Levi 2002 for Turkish). In the case of Equatorial Guinean Spanish, given the shorter average expanses between tonal peaks as compared to Peninsular varieties, tonal crowding may contribute to the high rate of prenuclear early peak alignment, although in Madrid Spanish even the most extreme tonal crowding does not typically result in F0 peaks being pushed back within the boundaries of the tonic syllable (e.g., Face 2002c, 88–89). Any effect of tonal crowding is likely to be additive rather than catalytic. The relatively high number of prenuclear pitch accents per utterance—and the consequent tonal crowding—appear to result from an L1 in which lexical tones (i.e., F0 peaks and valleys) have syllable-internal anchoring points.

4.3 Possible phonologization of tone in Guinean Spanish

The data collected for the present study reveal that the Spanish of Equatorial Guinea as produced by native speakers of the lexical tone languages Fang and Bubi differs both quantitatively and qualitatively from the natively spoken Spanish of central Spain, the region that supplied most of the original input for Guinean Spanish. Male and female Equatorial Guineans' Spanish departs significantly from the Spanish of Madrid in terms of the ratio of actually occurring to potential pitch accents as well as the proportion of early-aligned pitch accents. In effect, Equatorial Guineans approach the target of one pitch accent for every lexically marked Spanish tonic syllable; by including F0 pitch accent-like peaks not associated with tonic syllables, this figure is actually reached. At the same time Guinean Spanish retains the two fundamental features normally associated with pitch-/stress-accent languages rather than lexical tone languages: obligatoriness and (usually) culminativity (each lexical word has one and only one syllable marked for prominence, i.e., pitch accent). There is no evidence that patrimonial Spanish words are consistently realized with more than one pitch

accent. Another indication that pitch accents are becoming phonologized as lexical H tones would be tonal invariance for each word, i.e., not dependent on overall sentence intonational curves. This is demonstrably the case with Guinean place names used in Spanish such as Rebola (LHL), Malabo (LHL), Ureka (LHL), etc. and borrowings such as *balele* 'dance' (LHH) that retain their original tonal patterns, but also with words like *pichi* 'Pidgin English' < *pichinglis* (HH). Even patrimonial Spanish words approach tonal invariance in Guinean Spanish; unlike the varieties of Spain, in connected speech most Guinean Spanish words are pronounced with pitch accents corresponding to citation forms. This behavior is quite different from, for example, West African Englishes in contact with lexical tone languages. These contact varieties do not simply concatenate citation forms of English words, but rather have evolved innovative tonological patterns including high tone spreading, not found in Guinean Spanish. The reasons for the sharp discrepancy between Guinean and Peninsular Spanish (here exemplified by Madrid) are not entirely clear. Although in Peninsular Spanish polysyllabic words receive a pitch accent in citation forms, in connected speech the correspondence between lexical stress and H pitch accents is greatly diminished, as indicated in Table 1. Thus simple imitation of Spaniards' spontaneous speech is not likely to have been the primary source of Guineans' assignment of H pitch accents to nearly all lexically stressed syllables. For most Guineans, Spanish is learned principally in school and (until recently) was used mainly with non-Guineans. Citation forms as used in didactic classroom speech may have coalesced into retrievable exemplars around which Guineans attempted to reproduce Spanish prosodic patterns. For speakers of lexical tone languages such as Bubi and Fang, H tone placement is not optional or conditioned by discourse-level factors but rather is an integral part of each word's lexical specification. This same expectation, if extended to Spanish, would entail assigning a predictable and consistent tonal melody to each lexical item. The exemplar cloud for any Spanish lexical item pronounced by Peninsular speakers would contain both accent-less realizations as well as discernible pitch accents. The latter more closely resemble the syllable-anchored H and L tones of Guinean languages, and this salience might be sufficient to yield a "frozen" tonal pattern in connected Guinean Spanish.

In characterizing the autosegmental-metrical intonational model, Hualde (2002, 102) notes that "[…] in languages like English or Spanish only certain points in the utterance are phonologically specified for tone, the rest of the utterance being filled in by phonetic interpolation between tonally-specified points […] tonal events are associated with either stressed syllables or phrasal boundaries at the phonological level." While it is true that in Equatorial Guinean Spanish the majority of tonal events (H pitch accents) are associated with syllables marked for lexical stress, the overall density of pitch peaks (roughly every three syllables or less) suggests that rather than interpolation there is phonological alternation between H and L pitches. The regular retention of pitch accents on lexically stressed syllables together with the correspondingly lower

pitch on surrounding syllables is consistent with emergent lexical tones, but further research is required before phonologization of pitch as lexical tone can be asserted for Equatorial Guinean Spanish.

4.4 Pitch accents in Guinean Spanish and H tones in Bubi and Fang

Speakers of a lexical tone language usually have no default phrase-level intonational templates (except for general tendencies such as downdrift). In addition to the homology PITCH/STRESS ACCENT ≡ HIGH TONE, whose acoustic cues are attenuated or effaced during connected speech, the only suprasegmental roadmap possessed by speakers of a lexical tone language may be an intuitive awareness of the stochastic distribution of High and Low tones in the native language. Table 1 shows that the overall density of F0 peaks in Equatorial Guinean Spanish (pitch accents aligned with tonic syllables as well as other pitch accent-like pitch rises) more closely approximates the ratio High tones/syllables found in the natively spoken lexical tone languages Fang and Bubi than the distribution of pitch accents in Peninsular Spanish. This distribution is consistent with statistical learning of probabalistic patterns in indigenous Guinean languages, including the acquisition of tonal configurations (e.g., Zamuner, Gerken, and Hammond 2005). At present this observation is merely speculative; future research may reveal demonstrable transfer of tonal distributional patterns to Spanish.

5. Conclusion

A preliminary analysis of Spanish as pronounced by speakers of two African tone languages has revealed partial convergence of a Romance-grounded pitch accent system and configurations based on lexically specified phonological tones. The naturalistic data collected for the present study do not present a clear picture of possible differences between broad and narrow focus pitch accents; given the tendency to early-align the F0 peaks of all pre-nuclear pitch accents, the most likely strategy for narrow focus would be an additional elevation of the relevant F0 peak (also employed in many African lexical tone languages: Zerbian et al. 2010). Post-focus compression (e.g., Xu et al. 2012) is another possibility: reduction of pitch range and intensity of post-focus elements. The realization of interrogatives in Guinean Spanish also bears further exploration; like Peninsular Spanish absolute interrogatives typically end in a rising tone while pronominal interrogatives do not always end in the expected L% boundary tone. Possible pre-final F0 rises in pronominal interrogatives are also worth examining. Controlled elicitation may shed additional light on the prosodic marking of information structure in Guinean Spanish. More detailed analysis of pitch accent contours in Guinean Spanish and comparison with lexical tone contours in Fang and Bubi (e.g.,

along the lines of Barnes et al. 2012) may reveal more subtle aspects of L1 transfer than has been revealed by counting F0 peaks and alignment patterns.

Equatorial Guineans' Spanish maintains the one stress per word culminativity but effectively expands obligatoriness by actually realizing a pitch accent on nearly every syllable lexically marked for stress. There is evidence that the acquisition and processing of lexical tone languages differs qualitatively from non-tonal languages (e.g., Harrison 2000; Mattock and Burnham 2006; Maye, Werker, and Gerken 2002; Saffran, Johnson, Aslin, and Newport 1999; Yeung, Chen, and Gerken 2013). Equatorial Guineans' incomplete suppression of natively acquired F0 patterns and expectations may be facilitated by the metrical structure of Spanish, which provides for regularly occurring pitch accents whose maximum potential density is similar to that of H tones in Bubi and Fang. Given the entry of Equatorial Guinea into the Francophone Central African economic zone and the teaching of French in Guinean schools it would be instructive to examine Guineans' acquisition of French, a language lacking the quasi-regular lexical stress patterns of Spanish. The further study of these language contact environments may contribute to the understanding of the role of typological interfaces in shaping the phonological evolution of Spanish.

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