AFFRICATES, NASAL-OBSTRUENT SEQUENCES AND PHRASAL ACCENT IN TAJIO

Luh Anik Mayani*
Badan Pengembangan dan Pembinaan Bahasa
annie_mayani@yahoo.com

Abstrak

Di antara dua puluh fonem yang ditemukan dalam bahasa Tajio, fonem /t͡ʃ/ and /d͡ʒ/ memerlukan diskusi lebih lanjut karena kedua fonem itu dianalisis berbeda oleh beberapa peneliti yang mendeskripsikan kelompok bahasa Tomini-Tolitoli. Perbedaan analisis terhadap kedua fonem tersebut meliputi perbedaan tempat dan cara artikulasi. Dua aspek fonologis yang dibahas dalam makalah ini adalah urutan nasal-obstruent serta aksen frasa (phrasal accent) dalam bahasa Tajio. Kemunculan urutan bunyi itu di posisi awal bertentangan dengan sonority sequencing generalization (SSG). Urutan itu memicu dua jenis analisis, yaitu konsonan pranasal atau kluster. Tajio tidak memiliki tekanan/stres pada tataran leksikon (kata), tetapi memiliki aksen pada tataran frasa. Tanpa stres leksikal, kemunculan aksen bergantung pada letak suku kata dalam suatu intonasi frasa.

Kata kunci: *afrikat, nasal-obstruen, aksen frasa*

Abstract

Among twenty consonants found in Tajio, /t͡ʃ/ and /d͡ʒ/ need a further observation because in Tomini-Tolitoli languages they have been analyzed differently by different researchers. The differences pertain both to the place and manner of articulation. Aspects of Tajio phonology discussed here are nasal-obstruent sequences as well as phrasal accent. Initial nasal-obstruent sequences contradict the sonority sequencing generalization (SSG). The sequence of nasal+obstruent can be interpreted in two ways: as a prenasalized consonant or as a consonant cluster. Tajio does not have lexical (word) stress; rather, it has a phrasal accent. Without lexical stress, the presence of the pitch accent depends on the location of the syllable within the intonational phrase.

Keywords: *affricates, nasal-obstruent, phrasal accent*

INTRODUCTION

Tajio is an Austronesian language and belongs to the Tomini-Tolitoli language group, Central Sulawesi, Indonesia. Note that Sneddon (1993) refers to this group as the Tomini languages. The term Tomini-Tolitoli was introduced by Masyhuda (1975/81, as cited in Himmelman 2001) in order to indicate a certain subgrouping, and also as an alternative to the East Coast-centered term 'Tomini' which was first used by Adriani and Kryut (1941, cited in Himmelmann 2001, 14-16). Based on an extensive linguistic survey conducted from August 1988 to January 1989 and from February 1993 to April 1993, Himmelmann (2001) classifies eleven languages as belonging to this group: Totoli, Buano, Ampibabo-Lauje, Lauje, Tialo, Dondo, Balaesang, Pendau, Dampelas, Taje and Tajio.

However, although historical relationships between the Tomini-Tolitoli languages have been identified, it is still unclear whether these languages belong to a genetic group or whether they are just geographically related (Himmelmann 2001, 19).

Very few publications are available to describe the understudied language. To illustrate, Himmelmann (2001) and McKenzie (1991) estimate that Tajio is spoken by about 12.000–18.000 speakers in three subdistricts, i.e. Ampibabo, Tinombo and Sindue, Central Sulawesi. The neighbouring languages of Tajio are Ampibabo-Lauje, Pendau and Lauje. Tajio people live in the villages in the East Coast area (*Pantai Timur*) which administratively spreads from the village of Toribulu in the Kecamatan (subdistrict) Ampibabo to the village of Sipayo in the Kecamatan Tinombo, Central Sulawesi (Himmelmann 2001, 32). The geographic center of the Tajio speech community is Kasimbar, and perhaps unsurprisingly, Kasimbar is an alternative name for the Tajio language, or at least its main dialect (see Himmelmann 1991, 2001). Kasimbar is located ca. 200km north of Palu, the capital of the province of Central Sulawesi.
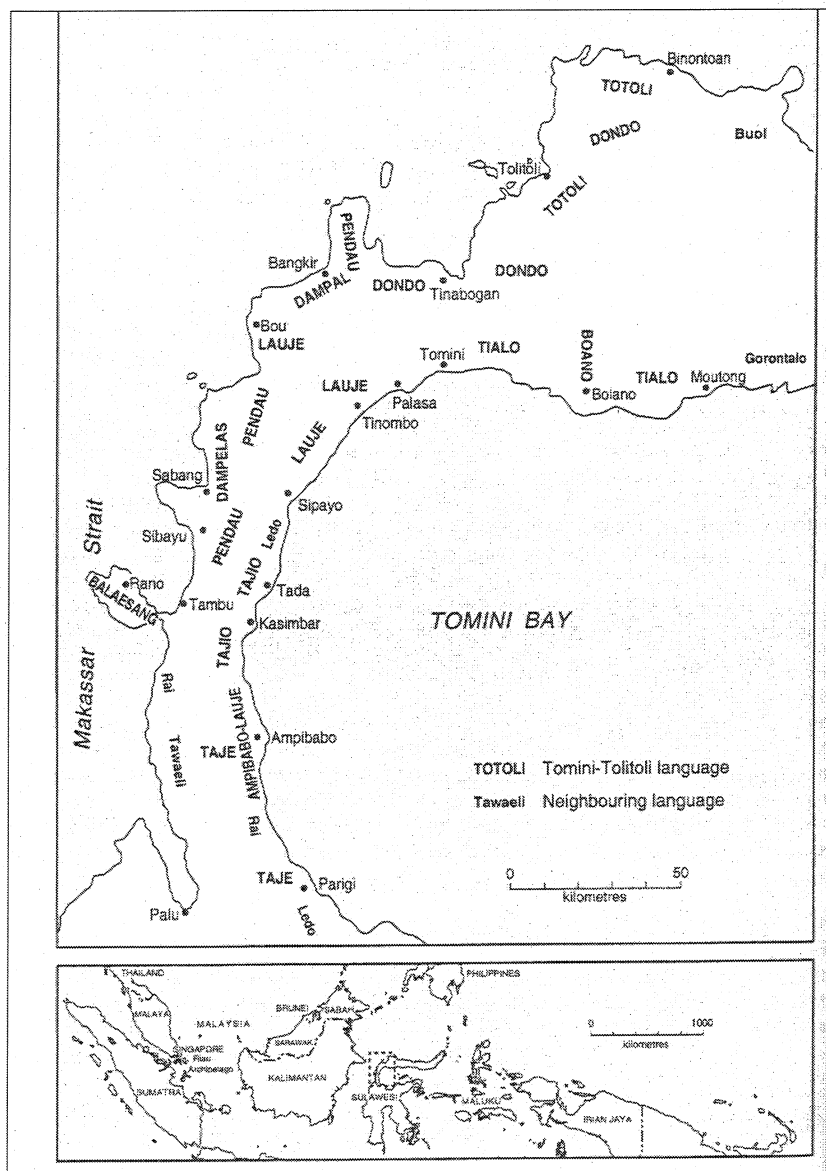
Map 1. Language Area of Tajio (Himmelmann 2001)

Under the Indonesian decentralization policy, which encouraged emerging independent subdistricts from within the provinces, Kasimbar formerly belonging to the Ampibabo subdistrict has now become a new subdistrict called Kasimbar subdistrict since 2004. Thus, Tajio is now spoken in four subdistricts, i.e., Ampibabo, Kasimbar, Tinombo and Sindue.

Tajio is understudied. The topics discussed in this paper are some interesting parts of the grammar of Tajio written by Mayani (2013). Among others, features on phonetics and phonology describe here are (1) the affricate sounds in Tajio, (2) the nasal-obstruent sequences and (3) *phrasal accent*.

Theories or works related to the topic discussed here will be integrated within the analysis. For example, in order to describe affricates in Tajio, some works from Ladefoged (2001) on English, Hungarian and Nunggubuyu will be compared to Tajio data. Works from Zanten et al. (2010) will be mentioned in the analysis on stress and intonation in Tajio in order to get illustration about how stress and intonation are described in some other languages in Indonesia.

PREVIOUS WORKS

In addition to the recent study on Tajio done by Mayani (2013), there are only two scholars who have conducted research on Tajio: Himmelmann (2001) who has collected data on Tajio as a part of his survey study on the Tomini-Tolitoli languages and McKenzie (1991) who has investigated the sociolinguistic situation in Tajio. Using lexicostatistics, McKenzie (1991, 24) identifies three dialects of Tajio: northern, central and western.

Other scholars have conducted research on neighbouring languages of Tajio. Quick (2007) has written a comprehensive grammar of Pendau; Moro (2010) has written a sketch grammar on Dampelas for her Master's thesis; Riesberg (2014) has conducted research on symmetrical voice systems in western Austronesian languages and analyzed Tolitoli together with three other languages (Indonesian, Balinese and Tagalog); Himmelmann and Riesberg (2013) have published a paper on symmetrical voice and applicative alternations in Totoli.

Other works on languages in Sulawesi include, among others, a grammar of Muna written by Berg (1989), a sketch grammar of Toratán (Ratahan) by Himmelmann and Wolff (1999), Donohue's grammar of Tukang Besi (1999) and Riehl (2008) who analyzes nasal-obstruent sequences found in four Austronesian languages including two languages spoken in Sulawesi, i.e., Pamona in Central Sulawesi and Manado Malay in North Sulawesi.

METHODOLOGY

Before going into the field, I had already started to build a database of Tajio based on the recordings of the Sulawesi word lists (about 1,478 entries) (Himmelmann 2001) and sentence lists (Himmelmann 1992 unpublished) compiled by Nikolaus Himmelmann, who conducted fieldwork on Tajio in the villages of Sienjo and Maninili in the 1990s. Having performed a preliminary analysis of this material, I decided to do my fieldwork in the villages of Kasimbar and Kasimbar Barat (West Kasimbar) in order to verify and increase the amount of data. My first fieldtrip took place for eight weeks from 12th April to 12th June 2011, the second was conducted in the same villages for four weeks between 21st July and 21st August 2012. During my fieldwork I stayed in Kasimbar Barat, which was chosen for me by the head of the Kasimbar

subdistrict. Kasimbar Barat and Kasimbar are about eight kilometers apart and are connected by an asphalt road.

My data were drawn from two types of recordings of (1) the Sulawesi word lists and elicited data which was compiled by individual interviews and (2) narratives, conversations and stimulus from a pear film (Chafe et al. 1985) and a frog story (Mayer 1969). Narratives were compiled by conducting individual interviews, meanwhile conversational data were recorded when a group of people gathered and having a conversation. The elicited and recorded lexical items were then compared with the data compiled by Himmelmann in the 1990s. In addition to the lexical items, I also elicited and recorded phonological and intonational data which were used to validate the phonological analysis I had done based on Himmelmann's data. The age of Tajio speakers being recorded in the field ranges between 31–73 years. They work as farmers, teachers, rattan drawers and school administrative staff.

The word lists and elicited data were − in addition to being recorded − written directly in a field note book and transcribed by myself. The transcription of elicited data was then checked by two language consultants. My language consultants are Tajio speakers who consistently assisted me during my field trip in Tajio. They speak Tajio in everyday conversation within family as well as with other Tajio people. In addition to Tajio, they speak a good command of Indonesian. I chose them as my language consultants because they have good understanding of Tajio and Indonesian and they can describe, for example, the context of situation where a certain structure is used.

The data which are used for analyzing affricates in Tajio are taken from the phonetic elicitation, especially lexicons which consist of the $/t^f/$ and $/d^3/$ sounds. The data for nasal-obstruent sequences are taken from lexical items which consist of nasal-obstruent sequences. The phrasal accent in Tajio are analyzed by using some lexicons which are pronounced in isolation and prosodic data in which phrasal accents are tested.

On affricate sound analysis, the manner of articulation is analyzed by using spectographic analysis. In this analysis, the spectograms of the Tajio affricate sounds are compared to spectograms of palatal plosives in Hungarian words. In addition, the fricative parts of the Tajio affricates are compared with fricative parts of English affricates and of Nunggubuyu affricates.

In order to diagnose the place of articulation of affricate sounds in Tajio, palatography and linguagraphy are applied in this paper. Palatography and linguagraphy are applied by painting the speaker's tongue with a mixture of coconut oil and cacao powder. After the tongue had been prepared in this way, the speaker was asked to pronounce a word consisting of an affricate sound.

Nasal-obstruent sequences analyzed in this paper are those which occur in word-initial and word-medial positions. These sequences are tested by comparing the duration to produce a single consonant and the duration to produce a nasal-obstruent sequence. Further evidence to analyze nasal-obstruent sequences are provided by reduplication and syllabification. Both tests are applied to determine whether or not such sequences are separable or inseparable.

Phrasal accent in Tajio are observed from words uttered in isolation as well as words in context, i.e., in the form of phrase or by adding a syllable to words being observed.

Affricates

In Tajio, /tˢ/ and /dˢ/ are palato-alveolar affricates that occur word-initially and word-medially, but never word-finally. Neither of them has further allophones.

Table 1. Distribution of Affricates

		Word-initial	Word-medial	Word-final
/tˢ/	[tˢ]	<colo'> /tˢoloʔ/ [tˢolɔʔ] 'matches'; 'to dye'	<vulucumi'> /βulutˢumiʔ/ [βulutˢumiʔ] 'mustache'	-
/dˢ/	[dˢ]	<jilo'> /dˢiloʔ/ [dˢilɔʔ] 'to lick'	<tuju> /tudˢu/ [tudˢu] 'to order/command'	-

/tˢ/ is a phoneme with limited distribution. It is mostly found in loan words, in particular in words of Indonesian origin. For example, the word *cahaya* 'light' in Indonesian has been borrowed as *caya* [tˢaja] and the Indonesian word *merica* 'pepper' is *marica* [maritˢa] in Tajio.

Affricates in Tomini-Tolitoli languages have been analyzed differently by different researchers. The differences pertain both to the place and manner of articulation. Concerning manner of articulation, the two sounds have been classified as plosives as well as affricates. With respect to place of articulation, they have been analyzed as dental, alveolar or palatal sounds.

Himmelmann (1991) considers <c> and <j> in the Tomini-Tolitoli languages as palatal stops and represents them phonetically as [c] and [ɟ]. Quick (2007) classifies <c> and <j> in Pendau as [tʃ] (voiceless dental sibilant affricate) and [dʒ] (voiced alveolar sibilant affricate) respectively. Similar differences in analysis are also found in the literature on Indonesian. Alwi et al. (1998) classify <c> and <j> in Indonesian as palatal affricates and represent them as [tʃ] and [dʒ] while Soderberg and Olson (2008) analyze them as post-alveolar affricates and represent them as [tˢ] and [dˢ].

Given the controversial status of affricates in these languages, the following sections are concerned with a close examination of manner and place of articulation of the affricates in Tajio. In contrast to affricate symbols used in the previous study, affricates in this paper are symbolized with a raised smaller symbol denoting the fricative part: [tˢ] and [dˢ]. The raised smaller symbol is used because the friction in Tajio's affricates are lesser than the friction in English affricates, i.e., [tʃ] and [dʒ]. Friction in Tajio affricates would rather appear to be similar to affricates found in Nunggubuyu, as clearly described in the following section.

Manner of Articulation of [tˢ] and [dˢ]

Spectrographic analysis supports the claim that these sounds are affricates rather than plosives. Figure 1 shows the spectrogram of the Tajio word *kacang* [katˢaŋ] 'bean' and Figure 2 the spectrogram of the word *ujang* [udˢaŋ] 'rain'. These can be compared to spectrograms of palatal plosives such as [c] and [ɟ] in the Hungarian words [ɔcɔ] and [ɔɟɔ] (Figure 3) as given in Ladefoged (2001, 148).
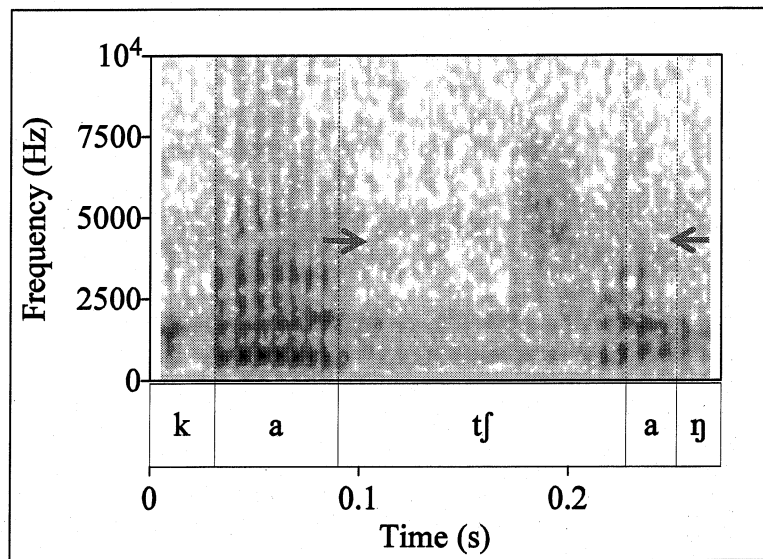
Figure 1. Spectrogram of the Word *kacang* **'bean'**
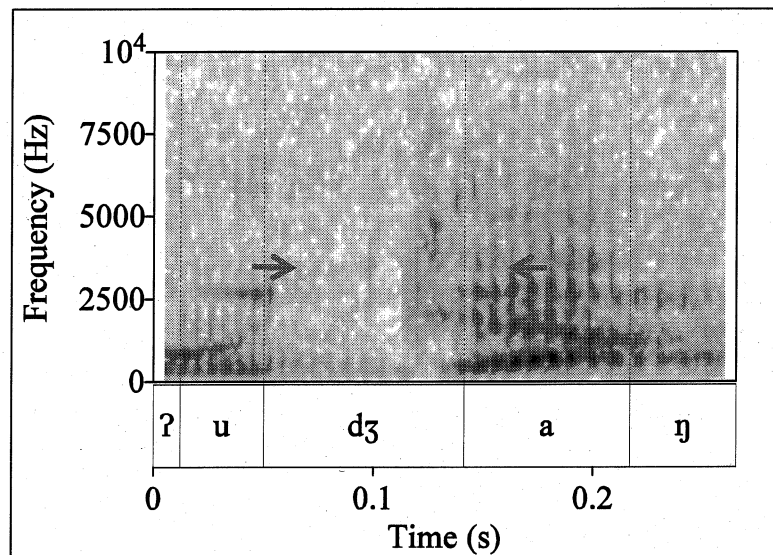

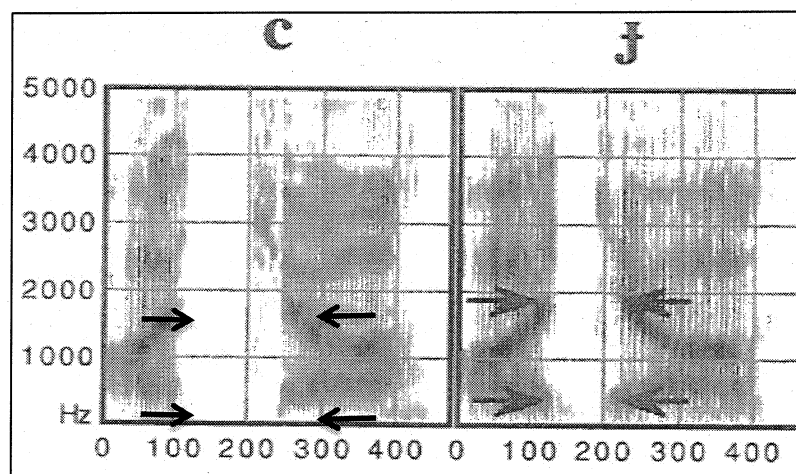**Figure 2. Spectrogram of the Word** *ujang* **'rain'**

Figure 3. Spectrogram of [c] and [ɟ] in Hungarian

Figure 3 shows that each of the two plosives ([c] and [ɟ]) in Hungarian has a clear-cut boundary. The arrows indicate the location of the first and the second formants as the closure is formed and released (Ladefoged, 2001, 140). By contrast, while there is also a clearly delimited closure in Tajio (Figure 1 and Figure 2), the closure is followed by a marked friction as indicated by the arrows. The spectrograms thus provide clear evidence for an analysis as affricates.

Note that the friction in Tajio affricates (see Figure 4 and **Error! Reference source not found.**) is less strong than the friction found in English affricates illustrated in Figure 6 from Ladefoged (2001, 59).
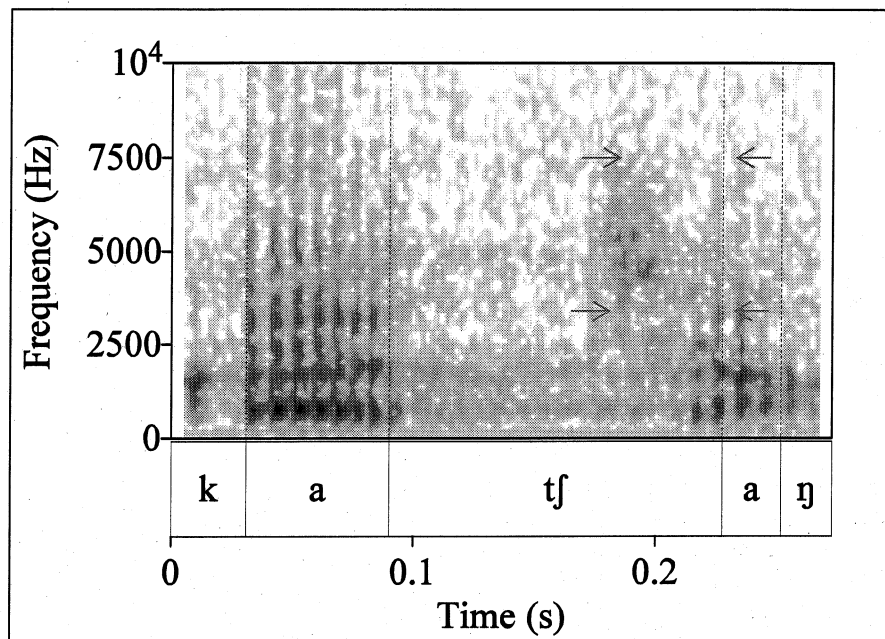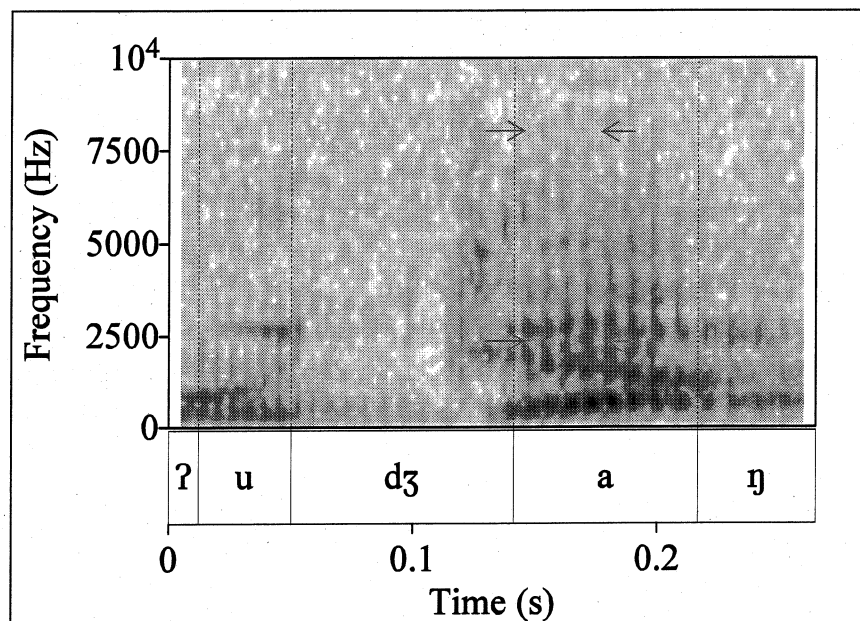

Figure 4. Spectrogram of the Word *kacang* 'bean'

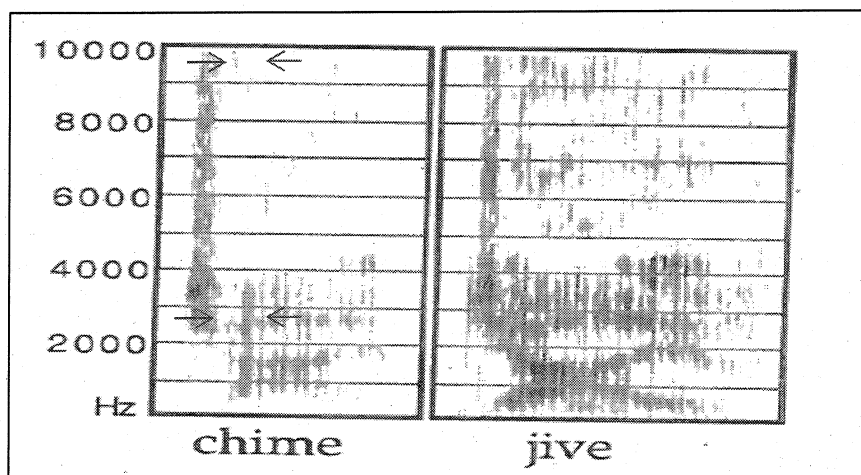**Figure 5. Spectrogram of the Word ujang 'rain'**

Figure 6. Spectrogram of [tʃ] and [dʒ] in English

As can be seen from Figure 4 and **Error! Reference source not found.**, the friction of the Tajio affricates is not clearly visible up in the 10.000 Hz range, in contrast to the English affricates. The friction of the Tajio affrictes is visible within range 2.500–7.500 Hz. The spectral range of the friction in Tajio affricates would rather appear to be similar to the ones found in Nunggubuyu, a language spoken in Australia (compare Figure 7). The friction of Nunggubuyu affricates in Figure 7 is within range 2.000–7.000 Hz.
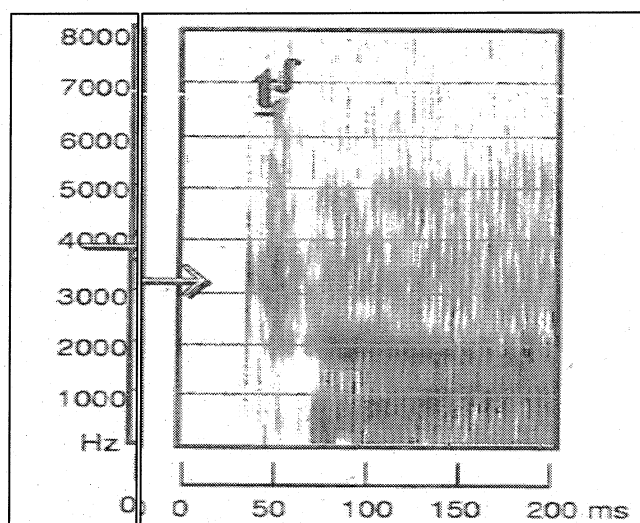

Figure 7. Spectrogram of [tᶠ] in Nunggubuyu (Ladefoged 2001:143)

Due to this lesser spectral extension, adopting the symbol used for Nunggubuyu, Tajio affricates are represented phonetically with a raised smaller symbol denoting the fricative part: [tᶠ] and [dᶾ] respectively.

Place of Articulation of [tʃ] and [dʒ]

With regard to the place of articulation, Ladefoged (1996 and 2001) illustrates the difference between palatal plosives and palato-alveolar affricates with the pictures given in Figure 8.
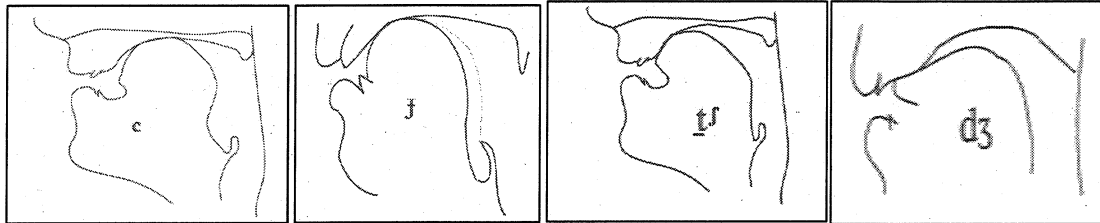

Figure 8. Place of Articulation of Palatal Plosives and Palato-alveolar Affricates (Ladefoged, 1996, p.32; 2001, p.144,147)

Ladefoged (1996, 32) defines palatal sounds as being made with the front of the tongue approaching or touching the hard palate. Palato-alveolars involve the hard palate as well as the back part of the alveolar ridge (Ladefoged 2001, 147).

The distinction discussed above can best be diagnosed with the help of palatography and linguagraphy (cf. Ladefoged 2001, 144).

For the analysis of the Tajio affricates, the speaker's tongue was painted with a mixture of coconut oil and cacao powder. After the tongue had been prepared in this way, the speaker was asked to say *aja*. The result is shown in Figure 9.
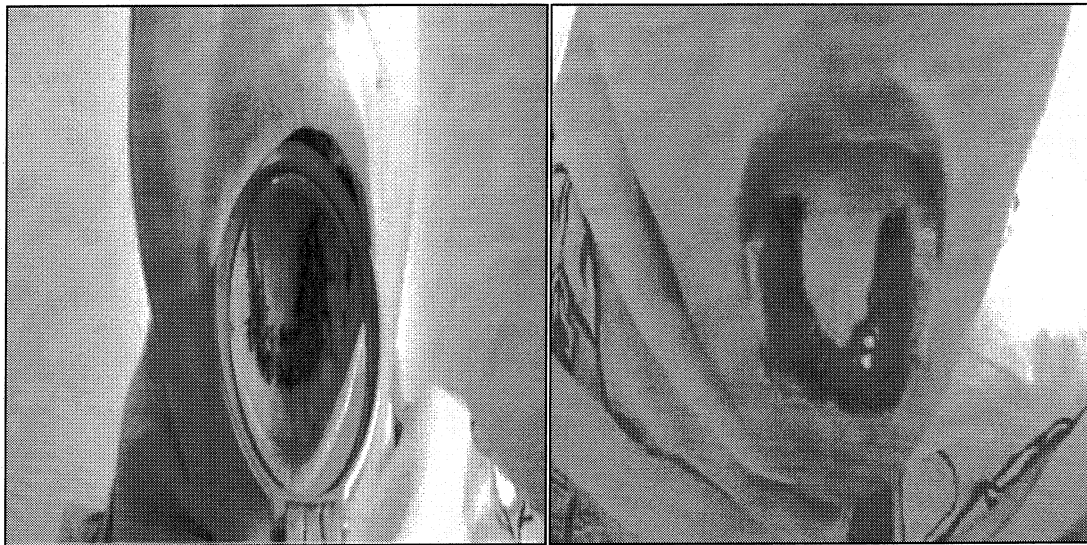

Figure 9. A palatogram (on the left) showing the roof of the speaker's mouth and a linguagram (on the right) showing the tongue after producing [dʒ] between two [a] (i.e., *aja*) in Tajio.

The palatogram shows that [dʒ] in Tajio is articulated by the blade of the tongue touching the hard palate and the back part of the alveolar ridge. The linguagram demonstrates that the part of the tongue involved is behind the tip and the blade. This points to the conclusion that [dʒ] in Tajio is a palato-alveolar affricate. Given that the only difference between [dʒ] and [tʃ] is the type of phonation (i.e., [dʒ] is voiced and [tʃ] is voiceless), it is safe to assume that [tʃ] is also palato-alveolar.

Nasal-obstruent Sequences

A study dealing with the phonological patterning of nasal-obstruent sequences and their phonetic realizations on four Austronesian languages—Tamambo and Erromangan of Vanuatu, and Pamona and Manado Malay of Indonesia has been done by Riehl (2008). Nasal-obstruent sequences found in Pamona and Manado Malay are /mp/, /mb/, /nt/, /nd/, /nc/, /ndʒ/, /ŋk/ and /ŋg/. She argues that nasal-obstruent sequences in both languages are clusters because they are heterosyllabic thus separable (Riehl 2008, 74-82). Further, based on the segmental duration analysis, Riehl (2008, 330) concludes that nasal-obstruent clusters in both Pamona and Manado Malay are substantially longer than plain nasals.

As with other languages in the area, the only sequence of consonants allowed in native Tajio words are sequences of nasals followed by a homorganic obstruent (see, for example, Himmelmann (1991, 56) on Lauje and Quick (2007, 33) on Pendau).

The homorganic nasal-obstruent sequences found in Tajio are /mp/, /mb/, nt/, /nd/, /nd³/, /ns/, /ŋk/ and /ŋg/. These sequences can occur word-initially and word-medially but never word-finally, as illustrated in Table 2.

Table 2. Nasal-obstruent Sequences

Nasal-obstruent	Word-initial	Word-medial	Word-final
/mp/	/mpojuŋ/ 'to whistle'	/sempo/ 'to be cheap'	-
/mb/	/mberek/ 'to remain, live, stay'	/teumbar/ 'spider'	-
/nt/	/ntameme/ 'to mumble'	/namanta/ 'to be ripe'	-
/nd/	/ndulago/ 'to sit with legs crossed'	/kinde/ 'to nod'	-
/nd³/	/njeru'/ 'be sleepy'	/lind³ɔk/ 'to run'	-
/ns/	-	/tensile/ 'to go home'	-
/ŋk/	/ŋkauŋ-kauŋ/ 'to crawl'	/teoŋkɔŋ/ 'arm'	-
/ŋg/	/ŋggeung/ 'to shake'	/beŋga/ 'buffalo'	-

Some of the initial nasal-obstruent sequences appear to be a shortened form of the prefix *noN-*, as seen in the following examples[4].

(1) *noN-* + *jilig* → *nonjilig*; *njilig* 'to flow'
(2) *noN-* + *gutu* → *nonggutu*; *nggutu* 'to make'
(3) *noN-* + *olong* → *nongolong*; *ngolong* 'to carry on the back'
(4) *noN-* + *ingking* → *nongingking*; *ngingking* 'to carry something hanging from hand'

But note that such sequences also occur in words other than dynamic verbs, such as with nouns like *ndaaŋ* 'branch', or with stative verbs, e.g. *ngkobor* 'to be weak (rope)' and *njou* 'to be wet'.

Initial nasal-obstruent sequences contradict the sonority sequencing generalization (SSG, see Hayes 2009, 76) and hence require further discussion. Based on the time needed to produce a sound (i.e., the segmental duration), the sequence of nasal+obstruent can be interpreted in two ways: as a prenasalized consonant or as a consonant cluster. As a prenasalized consonant, the nasal-obstruent sequence is treated as a single segment which needs a single timing unit. As a cluster, it is treated as two segments which need two timing units.

Evidence from segmental duration suggests the analysis of nasal-obstruent sequences in Tajio as clusters of two phoneme segments. The duration to produce a nasal-obstruent sequence is significantly longer than the duration to produce a single consonant (compare Figure 10-11 and Figure 12-13).

Figure 10 and Figure 11 respectively show the sequence /nd/ occurring word-initially in *ndaang* 'branch' and medially in the word *nendiis* 'to take a bath'. The duration to articulate /nd/ in the first example is 129 ms, and in the second example it is 115 ms.
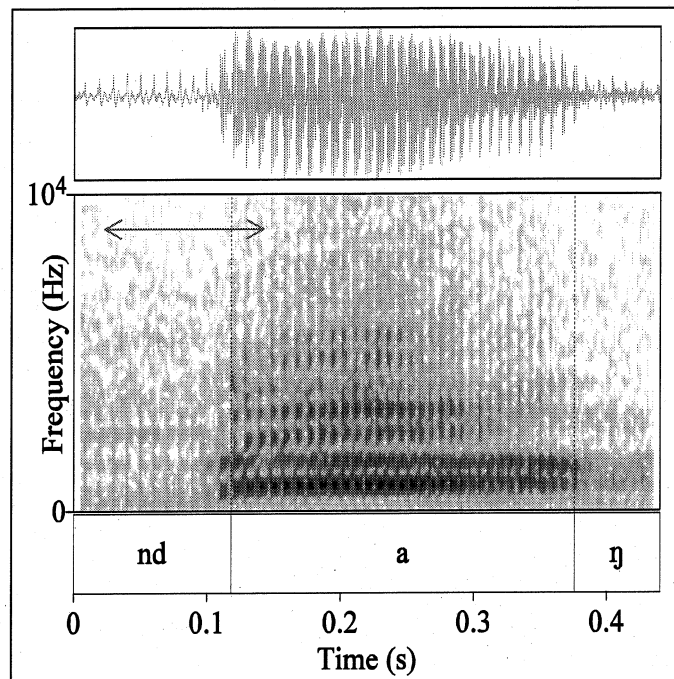

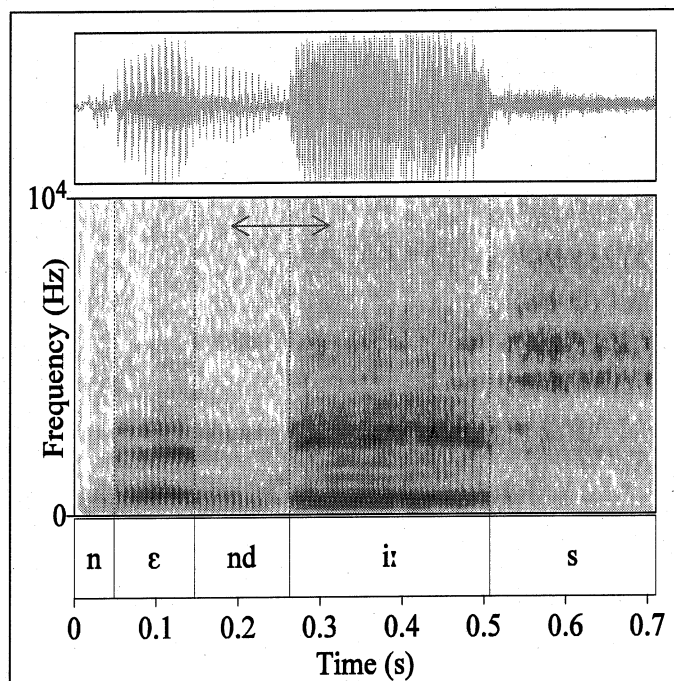**Figure 10. Timing Unit to Pronounce /nd/ in *ndaang* 'branch'**

Figure 11. Timing Unit to Pronounce /nd/ in *nendiis* 'to take a bath'

A single consonant, however, needs a shorter duration. Figure 12 shows that the length of the single consonant /n/ in the word *veeni* 'to give' is 85 ms; the consonant /d/ in the word *pudei* 'to break' in Figure 13 is 65 ms long.
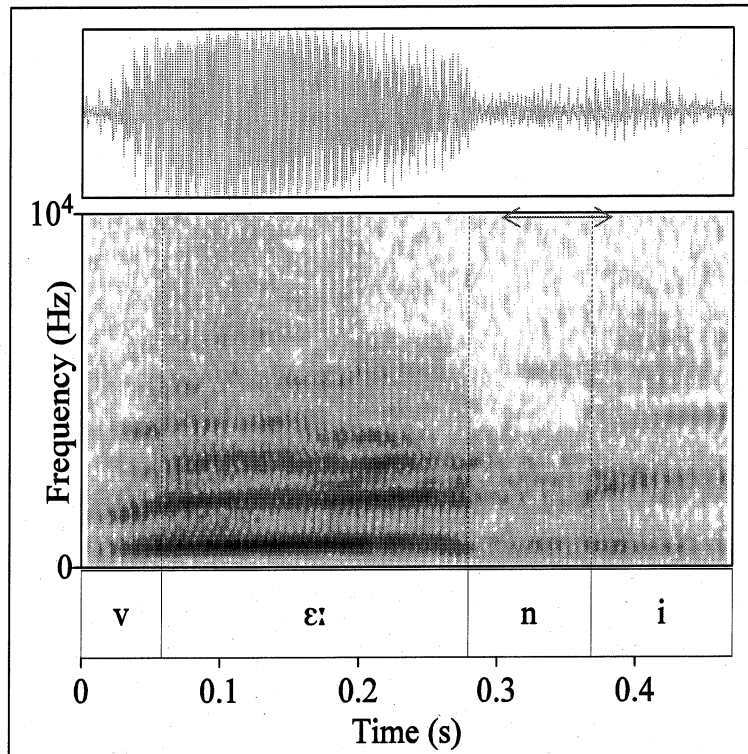

Figure 12. Timing Unit to Produce the Phoneme /n/ in the word *veeni* 'to give'
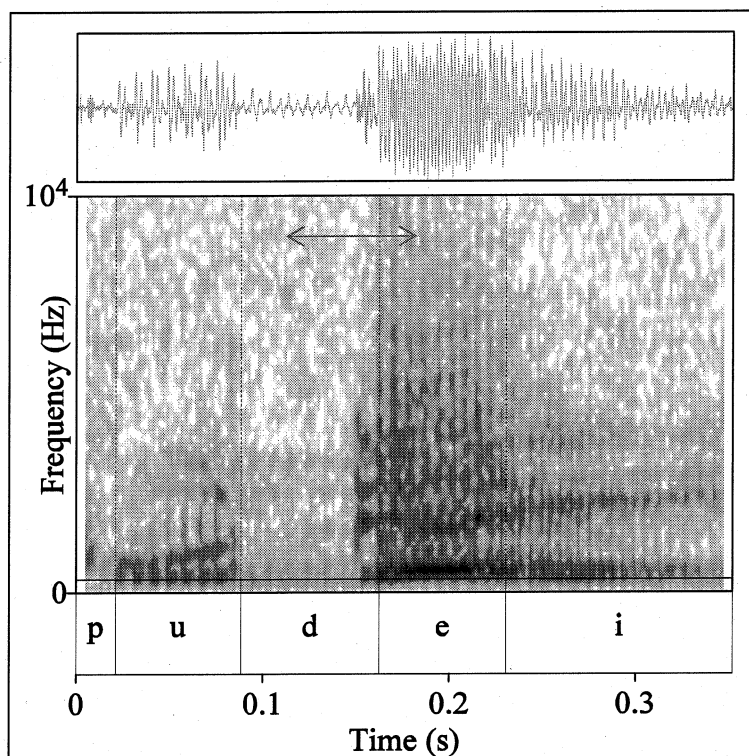

Figure 13. Timing Unit to Produce the Phoneme /n/ in the Word *pudei* 'to break'

Further evidence for a cluster analysis is provided by reduplication. If a nasal-obstruent sequence is analyzed as a single segment (i.e., a prenasalized consonant), it would be expected to behave like other consonants in reduplication (filling only the C position of the CV- and the CV.CV-reduplication templates). In such a case, /**mp**/ in *mpi.dak* 'to wink' would be predicted to fill only one C slot in the template. Thus, in bisyllabic reduplication, the expected form would be **mpi.da-mpi.dak* 'to wink', which is not attested in Tajio. The accepted form is *pi.da-mpi.dak* 'to wink', which in turn pinpoints the cluster analysis.

Adopting a cluster analysis for the nasal-obstruent sequences in Tajio leads to the following question with regard to the phonotactic status of the nasal: Is it to be analyzed as a "simple" nasal (non-syllabic) or a syllabic nasal? This is particularly relevant for word-initial nasal-obstruent sequences.

One way to decide between these options is a test based on syllabification. In the case of word-medial clusters, evidence from syllabification clearly suggests the simple nasal analysis. A word like /se**m-p**o/ is syllabified as (CVN-CV) where /m/ becomes the coda of the first syllable /sem/ while /p/ becomes the onset of the second syllable /po/. Initial nasal-obstruent clusters, however, are syllabified in a way that supports the assumption of a syllabic nasal. Compare the word /mberek/ 'to remain, live, stay' which is syllabified as /**m-be**-rek/ (**N-CV-CV**), not /**mbe**-rek/ (**CCV-CVC**). Although this matter requires further research, for the following discussion of syllable structure it will be assumed that word-initial nasal obstruent clusters involve syllabic nasals.

Phrasal Accent

Zanten et al. (2010) who examined word-stress level in Austronesian languages observe that in 15 out of 27 languages from Sulawesi, main stress is claimed to always the penultimate syllable (ibid, 94). The exact position of word-level stress, however, may shift due to, for example, paragogic vowels (ibid, 95) or suffixation (ibid, 99). In Betawi Malay, the vernacular of Jakarta, penultimate stress is observed only in phrase-final words as cited in Zanten et al. (2010, 100). Also as cited in Zanten et al. (ibid, 100) report on Lampung, a language of Sumatra, that "the word stress is very slight and it is often skewed by the position of the word in the intonation contour". Zanten et al. (ibid, 100) also mention difficulties in determining stress position in the Central Malayo-Polynesian languages Manggarai and Wetan. Stress in Manggarai is reported to be weak and in some contexts difficult to identify. The main characteristics of accentuation in Wetan are claimed to be its weakness and its relative instability.

Based on these observations, Zanten et al. (2010) suspect that some descriptions of stress do not actually pertain to word-based stress, but rather a phrase-based accent. They propose that it is important to distinguish between (word) stress and (phrasal) accent. They define word stress as a word-based linguistic property: "Stressed syllables, as opposed to unstressed syllables, have certain phonetic characteristics, of which a longer duration is the most robust one. In all positions in the phrase a stressed syllable of a word is longer than an unstressed syllable" (ibid, 101). In contrast, "accent is typically realized as an abrupt change in pitch, which has to occur in a specific position in the stressed syllable" (ibid, 101).

The following data suggests that Tajio does not have lexical (word) stress; rather, it has a phrasal accent. Without lexical stress, the presence of the pitch accent depends on the location of the syllable within the intonational phrase. In words uttered in isolation, the penultimate syllable is regularly prominent. But, this does not mean that all words are stressed on the

penultimate syllable. Rather, a phrasal accent regularly occurs on this syllable, because it is the penultimate syllable of an intonational phrase (i.e., it is auditorily prominent because a pitch rise associated with intonational phrases occurs on it).

Figure 14 shows that the location of the phrasal accent of the word *jilo'* 'to lick' spoken in isolation is on the penultimate syllable (the accented syllable is given in bold).
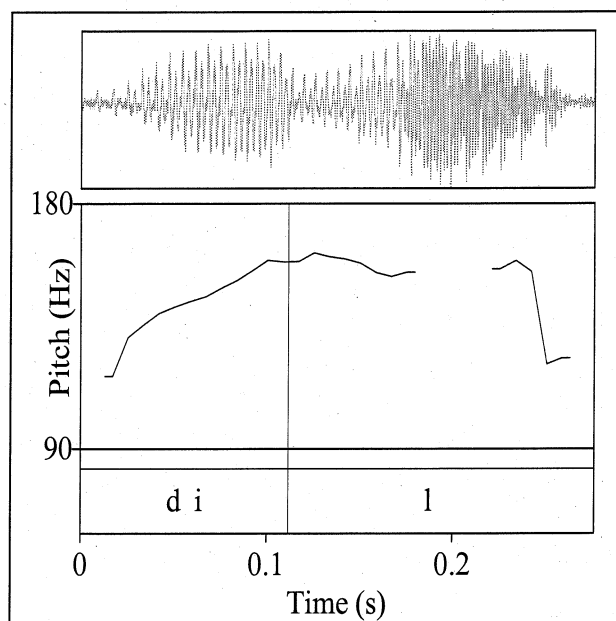

Figure 14. F_0 Extraction of the Word *jilo'* [jilɔʔ] 'to lick'

Being determined by location means that the position of the pitch accent changes if the position of a word in an intonational phrase changes. Accordingly, the pitch accent on *jilo'* 'to lick' shifts when a suffix *-i* is attached to become *jilo'i*, as illustrated in Figure 15. The accented syllable of the newly derived word is *lo* which is now the penultimate syllable.
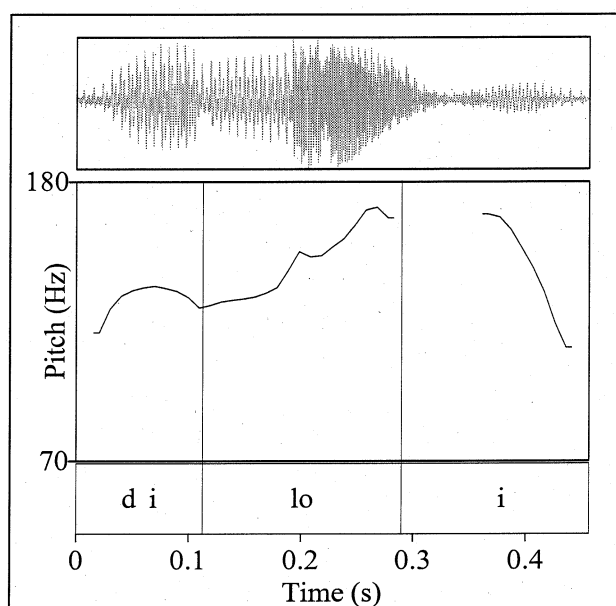

Figure 15. F_0 Extraction of the Word *jilo'i* [jilɔʔi] 'to lick'

As can be seen in both preceding figures, the pitch does not drop immediately at the beginning of the last syllable but rather falls continously over the last syllable. This can be analyzed as a final falling boundary tone following the high phrasal accent on the penultimate syllable.

Figure 16 provides another example. When *vu'u* 'bone' is pronounced in isolation, there is again a clear rise on the penultimate syllable.
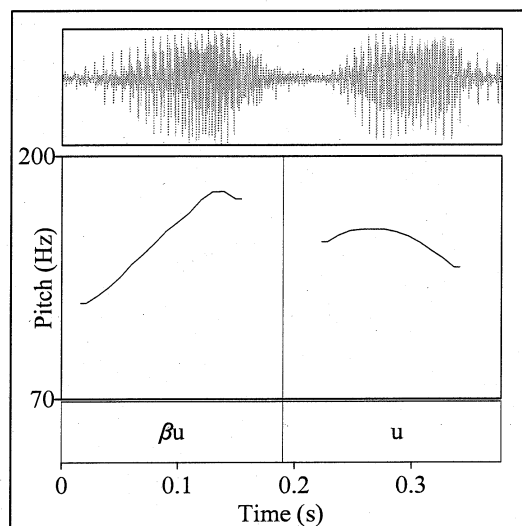

Figure 16. F₀ Extraction of the Word *vu'u* [βuʔu] 'bone'

This rise does not reflect word stress but rather a phrasal accent, as can be seen in Figure 17. Here *vu'u* 'bone' occurs as part of the noun phrase *vu'u nuusu'* 'rib bone'. If Tajio had lexical stress, each word in the noun phrase would be expected to have its own stress on the penultimate syllable. The F₀ extraction in Figure 17, however, shows that it is only the last word of the NP which gets highlighted by pitch. Neither syllable of *vu'u* 'bone' is highlighted by pitch, because now it occurs in phrase-initial position. The phrase accent has moved to the penultimate syllable of *nuusu'*. Note also that the two syllables of *vu'u* have the same duration and intensity, which could also be indications of lexical stress.
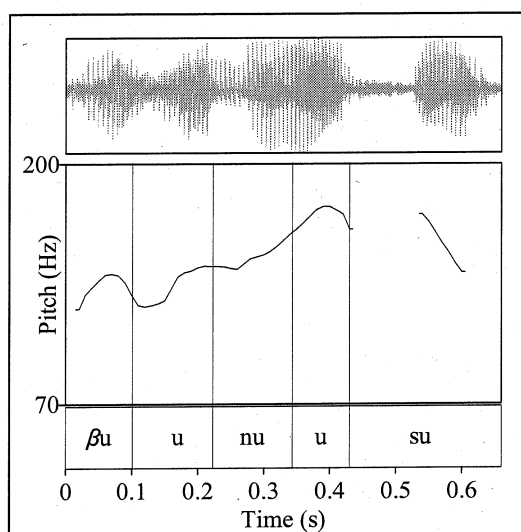

Figure 17. F₀ Extraction of the Noun Phrase *vu'u nuusu'* 'rib'

It is not possible to provide a detailed analysis of intonation in Tajio within the scope of this paper. As the above examples show, one very common (and possibly the default declarative) contour is characterized by a rising pitch on the penultimate syllable and a final fall, which could be analyzed as a H phrase accent followed by a low boundary tone (i.e., H-L% in autosegmental notation).

CONCLUSION

A close examination of manner of articulation, i.e. spectrographic analysis supports the claim that [tˢ] and [dʒ] are affricates rather than plosives. Further, the palatogram shows that these sounds are articulated by the blade of the tongue touching the hard palate and the back part of the alveolar ridge. The linguagram demonstrates that the part of the tongue involved is behind the tip and the blade. This points to the conclusion that [tˢ] and [dʒ] are palato-alveolar affricate.

Adopting a cluster analysis for the nasal-obstruent sequences in Tajio, one way to decide the sequences is a test based on syllabification. In the case of word-medial clusters, evidence from syllabification clearly suggests the simple nasal analysis. Initial nasal-obstruent clusters, however, are syllabified in a way that supports the assumption of a syllabic nasal.

Tajio does not have lexical (word) stress; rather, it has a phrasal accent. Without lexical stress, the presence of the pitch accent depends on the location of the syllable within the intonational phrase. A phrasal accent regularly occurs on penultimate syllable, because it is the syllable of an intonational phrase (i.e., it is auditorily prominent because a pitch rise associated with intonational phrases occurs on it).

NOTES

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