

SYLLABIFICATION IN BERBER: THE CASE OF TASHLHIYT

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ABSTRACT

It has been claimed that in the Tashlhiyt variety of Berber, spoken in the southern part of Morocco, all types of segments, including unvoiced stops, may function as syllabic. This interpretation is intrinsically dependent on how words are analyzed into syllables. The main goal of this paper is to investigate how native speakers regard these forms. An experiment in which Tashlhiyt speakers matched words with potentially syllabic consonants with words unambiguously composed of one or two syllables was conducted. The conditions for a consonant to function as the nucleus of a syllable implied by the results are then discussed.

1. INTRODUCTION

The domain where Berber languages (usually referred to as 'dialects') are spoken lies from the Mediterranean coast of Africa to the southern Sahara. It includes several varieties, each being composed of a cluster of (sub)dialects. The overall grammatical pattern is common to all vernaculars, notwithstanding significant lexical and phonological differences. The Tashlhiyt variety, spoken in the southern part of Morocco, has drawn particular attention from phonologists for its admittance of complex consonant sequences and of vowelless phonological words (see, for instance, Boukous [1]). The way words should be analyzed into syllable constituents in these cases is by no means trivial and depends on which segments are identified as nuclear. Dell & Elmedlaoui [3] raised the question at the heart of the problem: "Are there languages in which any segment can occur as a syllable nucleus? One such language is the variety of Tashlhiyt Berber spoken in Imdlawn (Morocco), where even a voiceless stop may act as a syllabic nucleus". On the other hand Coleman [2] interprets such segments in the framework of a model where "syllabic consonants in Tashlhiyt are the coproduced realization of phonological vowel and consonant".

The first aim of this paper is to present the results of an experiment in which native speakers (some illiterate) categorize a set of words as formed of one or two syllables. Consequently it is then possible to determine in which conditions a consonant qualifies for being syllabic.

2. DATA AND METHODS

A recording was made of a Tashlhiyt native speaker from Tafraout. A list of words and their French translation was first agreed upon. Naima Louali then pinpointed each written French item asking: 'magg ywa' (what is it?). The answer was given in Tashlhiyt. Two repetitions out of 6 were selected by the informant himself to be used in the tests. Seven Tashlhiyt speakers volunteered for an experiment which, they were said, had to do with the music (as opposed to the content) of Berber words. They passed a preliminary test involving only words whose syllable nuclei are vowels to confirm that they fully understood the task they were expected to perform. Table 1 shows the words used, which were presented in pairs. When the

expected answer, as shown in Figure 1, was given a smiling face appeared on the screen whereas a crying face appeared for a wrong answer. All subjects successfully performed the pretest. Five of them, who grew up in places dispersed over the Tashlhiyt area (Tafraout, Tanait, Massa, Tig^wrar, Anezi) performed both tests. Table 2 gives the 10 items contained in the first test while table 3 displays the 20 items forming the second test. For the first test the subjects were presented 45 pairs (each item being coupled with all others). Their task was to type on pre-marked keys representing Yes (Music is similar) or No (Music is different) answers. The task was similar for the 190 pairs presented in the second test.

	fad	tamart	ifka	tajuga	sin
fad		n	n	n	y
tamart			y	n	n
ifka				n	n
tajuga					n
sin					

Figure 1. Expected judgments of similarity in the pre-test

Table 1. Corpus for the pre-test

tamart	beard
fad	thirst
ifka	he has given
tajuga	pair
sin	two

Table 2. Corpus for test 1

mun	accompany!	mdi	take !
ldi	shoot !	sti	filter !
kti	think !	ildi	he has shot
inda	it m. has been churned	ikti	he has thought
isti	it has been filtered	afus	hand

Table 3. Corpus for test 2

gis	inside	rar	give back !
ls	put !	flt	leave it !
ns	spend a night !	ssnd	churn !
ks	pasture !	kst	pasture it !
fk	give !	ftk	give it
mnSk	how many	tkti	shehas thought
tsti	she has filtered	txznt	you sg. have stored
tsqsat	she asked her	irgl	he has locked
tnda	it f. has been churned	tidi	she has shot
tasa	liver	afud	knee

3. PERCEPTUAL RESULTS

Figure 2 adds up answers from the five subjects to test 1. Two clear patterns emerge. Items 'mdi', 'ldi', 'sti' and 'kti' were classified in the same category as 'mun' and judged as different from 'ildi', 'inda', 'ikti', 'isti' and 'afus'. That is, all words containing one vowel were grouped together regardless of their consonantal structure, and all words with two vowels were classed together.

	mun	mdi	ldi	sti	kti	ildi	inda	ikti	isti	afus
mun	5y	5y	5y	5y	5y	5n	5n	5n	5n	5n
mdi		5y	5y	5y	5y	5n	5n	5n	5n	5n
ldi			5y	5y	5y	5n	5n	5n	5n	5n
sti				5y	5y	5n	5n	5n	5n	5n
kti					5y	5n	5n	5n	5n	5n
ildi						4y	5y	5y	5y	5y
inda							5y	5y	5y	5y
ikti								5y	5y	5y
isti									5y	5y
afus										5y

Figure 2. Answers from the five subjects to test 1

The first pattern turns out to cover items categorized as monosyllabic. This categorization tends to prove that branching onsets are permitted in Tashlhiyt Berber (contra Jebbour [4]). Furthermore complex onsets may be formed by a sequence of a (non syllabic) nasal or liquid followed by a stop.

Figure 3 adds up answers from the five subjects to test 2. Two main groups emerge. The leftwards one groups items which are unambiguously monosyllabic. Insofar as 'tkti' is included in this pattern a complex 3-consonant onset turns out to be admissible in Tashlhiyt. The rightwards pattern contains items which are categorized as bisyllabic by at least four subjects. This rightward group contains words with liquids, nasals or 's' in a potentially syllabic position, suggesting that just these consonants can serve as syllable nuclei.

	gis	rar	ls	flt	ns	ssnd	ks	kst	fk	fkf	mfjk	ikti	tsti	txznt	tnda	ldi	tsqsat	irgl	tasa	afud	
gis	5y	5y	5y	5y	5y	5y	5y	5y	5y	5y	5y	5y	4y	3y	5n	5n	5n	5n	5n	5n	
rar		5y	5y	5y	5y	5y	5y	5y	5y	5y	5y	5y	5y	3y	5n	5n	5n	5n	5n	5n	
ls			5y	5y	5y	5y	5y	5y	5y	5y	5y	5y	3y	2y	5n	5n	5n	4n	5n	5n	
flt				5y	5y	5y	5y	5y	5y	5y	5y	5y	2y	3n	5n	4n	5n	5n	5n	5n	
ns					5y	5y	5y	5y	5y	5y	5y	5y	3y	1y	5n	5n	5n	5n	5n	5n	
ssnd						5y	5y	5y	5y	5y	5y	5y	2y	1y	5n	5n	5n	4n	5n	5n	
ks							5y	5y	5y	5y	5y	4y	5y	3y	5n	5n	5n	5n	5n	5n	
kst								5y	5y	5y	5y	5y	5y	3y	4n	5n	5n	5n	5n	5n	
fk									5y	5y	5y	5y	5y	1y	2y	5n	5n	4n	5n	5n	
fkf										5y	5y	5y	5y	2y	2y	5n	5n	5n	5n	5n	
mfjk											5y	5y	5y	2y	3y	4n	5n	5n	5n	5n	
ikti												4y	2y	5n	5n	4n	5n	5n	5n	5n	
tsti													5y	1n	5n	1n	4n	5n	5n	5n	
txznt															3n	3y	3n	3n	3n	3n	
tnda																5y	5y	4y	5y	5y	
ldi																	5y	5y	5y	5y	
tsqsat																		5y	5y	5y	
irgl																			5y	5y	
tasa																				5y	
afud																					5y

Figure 3. Answers from the five subjects to test 2

Items 'tsti' and 'txznt' require a closer look. Figure 4 plots Yes/No answers for comparison of 'tsti' with all other items. This form is invariably classified with monosyllables for subjects 1, 2 and 4. Subjects 3 and 5 hesitate between the two patterns.

	gis	rar	ls	flt	ns	ssnd	ks	kst	fk	fkf	mfjk	ikti	txznt	tnda	ldi	tsqsat	irgl	tasa	afud	
Subject 1	y	y	y	y	y	n	y	y	y	y	y	y	y	y	n	n	n	n	n	n
Subject 2	y	y	y	y	y	y	y	n	y	y	y	y	y	n	n	y	n	n	n	n
Subject 3	n	y	n	y	n	n	y	y	n	n	n	n	n	n	y	y	y	y	n	n
Subject 4	y	y	y	y	y	n	y	y	n	n	n	n	y	y	y	y	y	y	n	n
Subject 5	y	y	n	y	n	y	y	y	n	n	n	n	y	y	y	y	y	y	y	n

Figure 4. Answers from the five subjects for item *tsti*

For item 'txznt' the classification of subject 5 is opposite to subject 1. Subject 3 rejects assimilation of this item to either pattern, as evidenced in Figure 5.

	gis	rar	ls	flt	ns	ssnd	ks	kst	fk	fkf	mfjk	ikti	tsti	tnda	ldi	tsqsat	irgl	tasa	afud	
Subject 1	y	y	y	y	y	n	y	y	y	y	y	y	y	n	n	n	n	n	n	n
Subject 2	y	y	y	n	n	n	y	y	n	n	y	y	y	n	n	n	n	n	n	n
Subject 3	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	y	y	n	n
Subject 4	y	y	n	y	n	y	y	y	y	y	n	y	n	y	n	y	n	n	n	n
Subject 5	n	n	n	n	n	n	n	n	n	n	n	n	n	y	y	y	y	y	y	y

Figure 5. Answers from the five subjects for item *txznt*

4. ACOUSTIC ANALYSIS

We looked into the acoustic realization of the two items for which the subjects differ in their judgment. Sonagrams in Figures 6 and 7 allow a comparison for the fricative 's' in 'tsti' and 'isti'.

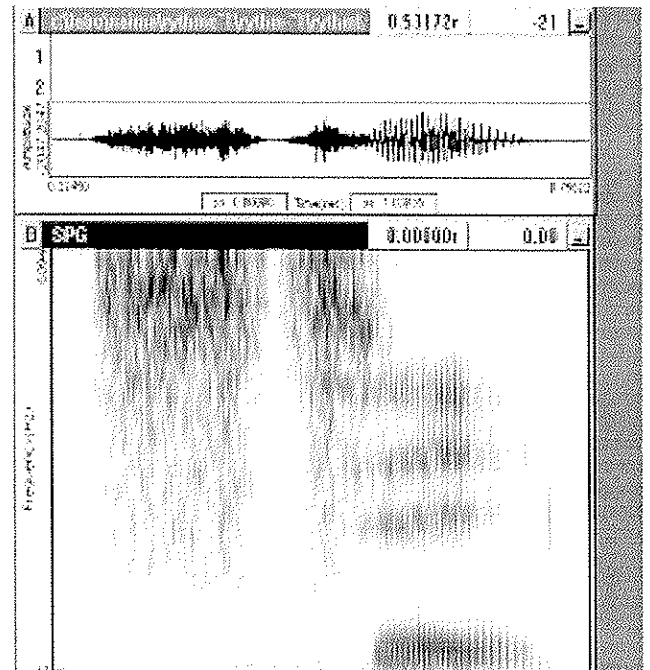


Figure 6. Sonagram of one pronunciation of *tsti* used in the experiment

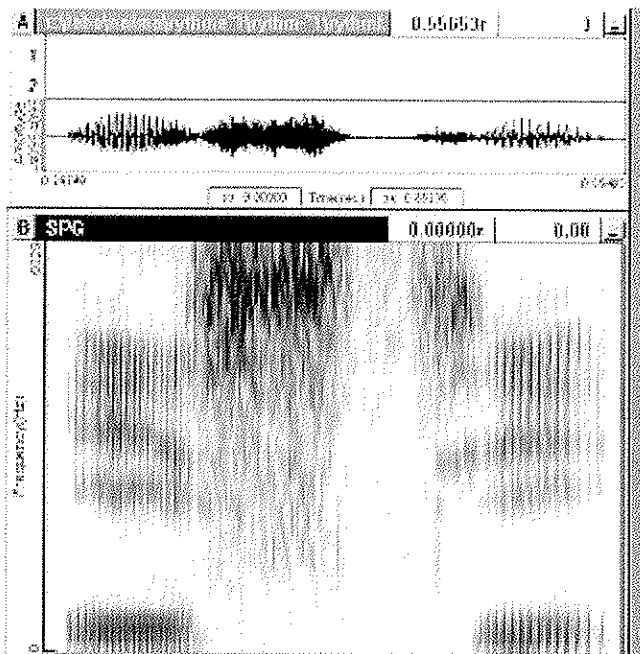


Figure 7. Sonagram of one pronunciation of *isti* used in the experiment

The duration of the fricative after the explosion of the stop in Figure 6 (*tsti*) is 141 ms whereas it is 137 ms in Figure 7 (*isti*) before the closure of the stop.

We measured the length of the fricative 's' after a vowel and between two consonants in minimally contrasting words for 10 repetitions with the informant who recorded the data used for the perceptual experiment. Figure 8 confirms that there is no significant difference in length for a 's' in these words for this speaker.

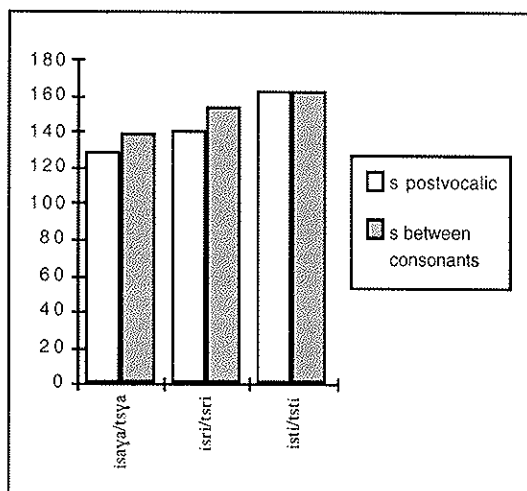


Figure 8. Mean duration for 's' after vowel and between consonants for the speaker used in listening tests.

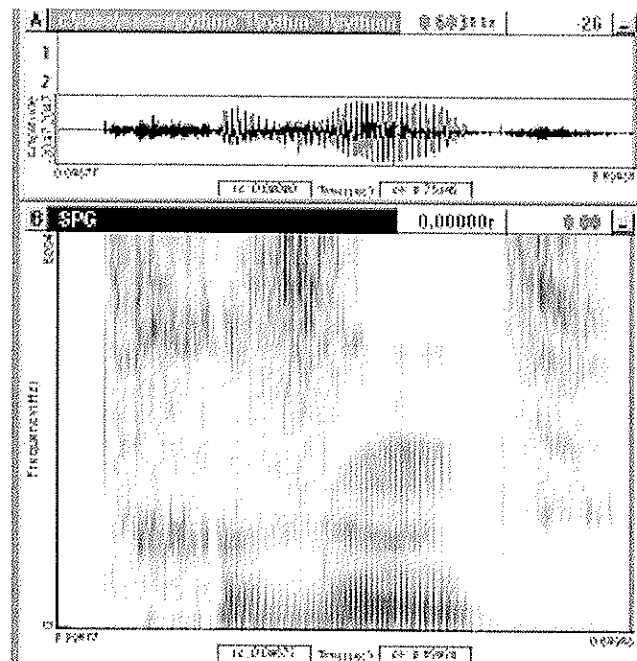


Figure 9. Sonagram for one pronunciation of *txznt*

A vocoid 'schwa' is clearly visible between the two fricatives 'x' and 'z' in 'txznt'. Its duration is 32 ms on the sonagram in figure 9 and of 35 ms for the other repetition. It thus qualifies to occupy the nucleus position of a syllable. However it appears to be perceived as a mere transition between the unvoiced velar fricative and the voiced coronal one by subjects categorizing 'txznt' as monosyllabic, assuming that the nasal is syllabic in both interpretations.

5. DISCUSSION

Some phonology oriented observations may be induced from the data which have been presented so far.

Tashlhiyt Berber admits branching onsets in a syllable, as in:

- 'kti' (stop + stop)
- 'sti' (fricative + stop)
- 'mdi' (nasal + stop)
- 'ldi' (liquid + stop)

A 3-consonant onset is certain insofar as 'tkti' is categorized as monosyllabic by all subjects and possible for 'tsti' and 'txznt' which are also categorized as monosyllabic by some subjects.

On the basis of more general investigations we have observed that a vocoid is always present in the realization of a Tashlhiyt phonological word; if no full vowel (*i*, *u* or *a*) is included then a schwa vocoid shows up. This is also true for words composed only of unvoiced obstruents, as in 'tqssf' (it fem. shrunk), contrary to Dell & Elmedlaoui [3].

As in many other languages Tashlhiyt Berber allows liquids and nasals to occupy the nuclear position of a syllable; the fricative 's' may be part of a complex onset (like in 'sti') or be syllabic (like in 'tsqsat'). On the other hand our data do not support the view that unvoiced stops may occupy the nuclear position or that a voiced vocoid cannot be inserted when the phonological sequence consists of unvoiced obstruents only.

ACKNOWLEDGMENTS

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