AN OBSERVATION TOWARDS SOME PHONOLOGICAL RULES AND PROCESSES IN MADURESE

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Abstrak: Aturan fonologis merupakan fenomena alami yang biasa ditemukan di setiap bahasa dunia. Terdapat sejumlah aturan fonologis, di antaranya adalah insersi, asimilasi, pelesapan, pelemahan, penguatan, dan lain-lain. Dalam penerapannya, aturan-aturan tersebut harus diurutkan untuk menghasilkan output fonetis yang gramatikal, yaitu output yang sesuai dengan aturan fonologis bahasa bersangkutan. Artikel ini menyajikan sejumlah aturan fonologis yang berlaku dalam bahasa Madura.

Kata Kunci: phonological rule, rule ordering, underlying representation, surface representation, deletion, gemination, velarization

Introduction

Phonological rules are natural phenomena which are commonly found in any of the world's languages. By the application of a phonological rule, a segment may need to be inserted, deleted, lengthened or weakened in order that the segment can adapt to the environment where it occurs. A number of rules may require an interaction in order to produce a legitimate surface representation. Under certain circumstances, rule interaction also requires rule ordering to produce a grammatical output of a phonetic representation. In such a case, rule ordering is considered to be obligatory.

Like any other languages, Madurese possesses its own unique phonological rules as well. Madurese is an Austronesian language mainly spoken on Madura, East Java Province, Indonesia and a number of small adjacent islands such as Bawean, Sapudi, and Kangean. Madurese is also spoken in some other regencies of East Java, most of which are located along the northern coast of the eastern part of the province, i.e., Pasuruan, Probolinggo, Situbondo, Bondowoso, and Jember. Some of the people in those regencies, in fact, used to be Madurese migrants and still maintain contact with their mother land.

The main objective of the current paper is to present and discuss some phonological rules in Madurese. In order to accomplish this, a number of data were collected, presented, and analyzed employing relevant phonological theories.

Vowels and Consonants in Madurese

Stevens (1968, 1992) classifies Madurese vowels into four underlying vowels—a front unrounded vowel which ranges in pronunciation from [i] to [ɛ]; a back rounded vowel which ranges in pronunciation from [u] to [ɔ]; a lower back unrounded vowel which ranges in pronunciation from [ɤ] to [a];

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and a higher back unrounded vowel which ranges in pronunciation from [ɨ] to [ə]. He suggests that the surface form, which consists of eight vowels and is the actual pronunciation of each of the vowels, is phonologically conditioned by the preceding consonants. He argues that the lower set which consists of /e/, /ə/, /o/, and /a/ constitutes the underlying vowels due to their occurrences in neutral word-initial position.

Table 1 The Madurese vowel inventory (Cohn & Ham, 1998).

	Front		back	Environment
High	I	ɤ	a	[+high] and aspirated stops
		ɨ		
Mid	ɛ	ə	ɔ	[-high] after voiceless stops
Low		a		

Madurese shows a relatively rich feature in terms of the number of its stops. In comparison with the closest neighboring languages such as Balinese, Javanese, and Sundanese, Madurese is distinctively unique, i.e., while those other languages have a two-way phonation contrast: voiced and voiceless, it has three: voiced, voiceless and voiceless aspirated (Stevens, 1968). However, despite the rich consonant inventory, Madurese has quite restricted word-final position of occurrence for the consonants; only the consonants enclosed in boxes may occur word-finally. The only consonant which does not occur word-initially is /ʔ/ and in word medial-position it only occupies a syllable-coda position.

Table 2 The Madurese consonant inventory (Cohn & Ham, 1998).

		labial	dental	retroflex/ alveolar	Palatal	Velar	glottal
Stops	Voiced	b	d	ɖ	ɟ	g	
	Voiceless	p	t	ʈ	c	k	
	Aspirated	pʰ	tʰ	ʈʰ	cʰ	kʰ	
Fricative				s		ŋ	
Nasals		m	n		ɲ		
approximants		(w)		l, r	j		ʔ (h)

Phonological Rules in Madurese

A. Glottal stop deletion

The glottal stop deletion rule may apply under certain environments. To know whether a segment has been deleted under a specific phonological context, let's observe the following data.

(1) saŋaʔ+ lɛkɔr → saŋalɛkɔr 'twenty-nine'

bɤlluʔ+ lɛkɔr → bɤllulɛkɔr 'twenty-eight'

pɛttɔʔ+ lɛkɔr → pettɔlɛkɔr 'twenty-seven'

The data show that the glottal stop /ʔ/ is deleted when it is followed by the dental liquid /l/. However, this rule is seemingly inapplicable to such a construction as bɤlluʔ+ lɛmaʔ because it will result in an ungrammatical surface structure [bɤllulɛmaʔ]* in Madurese. In that case, the glottal stop cannot be deleted and in order to make it grammatical it should be realized as [bɤlluʔlɛmaʔ]. What does phonological condition contribute to this phenomenon? The following data provide a number of examples in which the phonological phenomenon may appear to occur.

(2) saŋaʔ+ pɛttɔʔ→ saŋaʔpɛttɔʔ 'nine seven'

pɛttɔʔ+ saŋaʔ→ pɛttɔʔsaŋaʔ 'seven nine'

saŋaʔ+ lɛmaʔ→ saŋaʔlɛmaʔ 'nine five'

The data above seemingly demonstrates that the glottal stop deletion cannot occur or is not allowed when the following word also ends in the glottal stop. So, this constraint appears to be able to explain the ungrammaticality of [bɤllulemaʔ]* previously mentioned.

The data in (1) and (2) give a more clear description of the phenomenon of glottal stop deletion rule constraint. Indeed, if the data in (1) are examined more closely, it will be clear that [saŋalɛkɔr] 'twenty-nine', for example, is in fact a word consisting of two morphemes, that is, a free morpheme {saŋaʔ} and a bound morpheme {lɛkɔr}. The morpheme {lɛkɔr}, however, is an unproductive bound morpheme in Madurese because it exclusively attaches to numerals beginning from 21 to 29.

On the other hand, the data in (2) show a different case in the sense that [saŋaʔpɛttɔʔ] 'nine seven', for instance, is obviously comprised of two free morphemes, namely {saŋaʔ} and {pɛttɔʔ}. This condition clearly explains the constraint and inapplicability of the glottal stop deletion. In a nutshell, the rule is limited to numerals in Madurese beginning from 21 to 29. For example, it does not apply to constructions like [tadhaʔkadhaʔ] 'it finished early', and [bɤɲaʔŋalaʔ] 'many people took them', which by definition are not numeral constructions.

B. Glottal stop velarization

The following data show another phonological phenomenon in Madurese.

(3) saŋaʔ+ polo → saŋaŋpolo 'ninety'

bɤlluʔ+ polo → bɤlluŋpolo 'eighty'

pɛttɔʔ+ polo → pɛttɔŋpolo 'seventy'

The data in (3) show that the glottal stop /ʔ/ is realized as a velar nasal /ŋ/ when it is followed by a voiceless bilabial stop. However, the application of

the rule is very limited due to the fact that it only applies to expressions of ordinal numbers. In terms of assimilation, this phenomenon is quite natural, that is, compared with the glottal stop, the velar nasal is relatively close to a bilabial stop in terms of place of articulation. In this respect, it seems that a kind of spirantization or lenition occurs to make the articulation of the glottal stop smooth when it is followed by another stop, which is in this case, a voiceless bilabial stop.

However, it cannot be taken for granted that the rule can apply to other phonological constructions. Of particular importance to note here is that it is very likely that the glottal velarization rule can only be applied to phonological phrases expressing ordinal numbers from seventy to ninety-nine. So, the rule is considerably limited and cannot be extended to other phonological constructions. For example, based on this rule, bɤɲaʔ+ padɤ 'to have many things in common' should be realized as [bɤɲaŋpadɤ] due to the fact that the expression has the same phonological environment as the expressions of ordinal numbers previously presented. However, this is not yet really the case. In fact, the surface realization [bɤɲaŋpadɤ]* is illegitimate or ungrammatical from the perspective of Madurese phonology. Therefore, to make it acceptable, it should be realized as [bɤɲaʔpadɤ].

The idiosyncratic nature of the rule sometimes confuses not only non-native speakers of Madurese but also Madurese children alike, in which case they tend to overgeneralize it. For example, both non-native speakers and children will tend to realize *bɤɲaʔ+ padɤ* as [bɤɲaŋpadɤ]*, or the other way round, *bɤlluʔ+ polo* as [belluʔpolo]*.

C. Glottal stop velarization and voiceless alveolar fricative deletion

It is generally acknowledged in the current literature of phonology that due to the application of phonological rules, a certain segment may be added, deleted, weakened, geminated or even strengthened (Spenser, 1996; Gussenhoven & Jacobs, 1998; Roca & Johnson, 1999). In this case, phonological rules may interact with one another to produce a grammatical surface representation.

(4) saɲaʔ+ satɔs → saɲaɲatɔs 'nine hundred'

pɛttɔʔ+ satɔs → pɛttɔɲatɔs 'seven hundred'

ənnɨm + satos → ənnɨmatos 'six hundred'

The data in (4) exhibit a quite complex phonological process. Two types of processes are being involved here, i.e. (1) deletion of voiceless alveolar fricative /s/ and (2) glottal stop velarization. However, it is rather difficult to determine which rule applies first, that is, either the velarization of the glottal stop /ʔ/ precedes the deletion of the voiceless alveolar fricative /s/ or the other way round, the deletion of the voiceless alveolar fricative /s/ precedes the velarization of the glottal stop /ʔ/. To make it simpler, it is better to try the application of each rule order, which can be formulated as follows:

(5) Underlying representation   saŋaʔ + satɔs

Voiceless alveolar fricative deletion   N/A   atɔs

Glottal stop velarization   saŋaŋ   N/A

Surface representation   [saŋaŋatɔs]

Does rule ordering matter in this case? To find out whether the ordering is important, let's check it by changing the order of the rules as follows:

(6) Underlying representation   saŋaʔ+ satɔs

Glottal stop velarization   saŋaŋ   N/A

Voiceless alveolar fricative deletion   N/A   atɔs

Surface representation   [saŋaŋatɔs]

It seems obvious from (5) and (6) that rule order does not matter in this case; that is, the application of glottal stop velarization and voiceless alveolar fricative deletion can be freely ordered since each ordering procedure ends up with the right surface representations. In other words, each output produced by the different rule order is equally grammatical.

The analysis above seems to satisfy our expectations about the optionality of the rule ordering in that case. However, there is something peculiar with the analysis if rule interaction is to be taken into account. In either (5) or (6) no rule interaction is found; they seem to 'work' individually and independently. In this case, I prefer to resort to ordering the rules to show that rule interaction indeed occurs here. In my perspective, voiceless alveolar fricative deletion provides an environment for the velarization of the glottal stop to occur. This type of rule interaction and rule ordering is known as feeding order (Spenser, 1996; Gussenhoven & Jacobs, 1998; Roca & Johnson, 1999). To put it differently, although (5) and (6) are both grammatical, (5) is more natural in terms of rule ordering and interaction.

C. Glottal stop insertion

(7) ɛpapadɤ + ɤ → ɛpapadɤʔɤ 'will be made the same'

ɛpatadɤ + ɤ → ɛpatadɤʔɤ 'will be finished'

ɛparaʔɤ + ɤ → ɛparaʔɤʔɤ 'will be made big'

ɛpatowwa+ a → ɛpatowwaʔa 'will be made ripe'

The data in (7) demonstrates another different phonological phenomenon, namely a glottal stop insertion. It can be seen that a glottal stop is inserted when a verb ending in a vowel is followed by suffixes such

as /ɣ/ and /a/, which are also vowels. This phenomenon is quite similar to /ɹ/ intrusive in English where /ɹ/ is inserted in such constructions as media event [mediəɹ əvɛnt], law and order [lɔɹ ən ɔ:də], etc. The reason behind this insertion can be motivated phonetically, that is, for the sake of ease of articulation.

C.1. Glide insertion and gemination

(8) ɛpapotɛ + a → ɛpapotejja 'will be made white'

ɛterrosakʰi + a → ɛtərrosakʰijjɣ 'will be made continued'

ɛpabɣndhɣrrakʰi + a → ɛpabɣndhɣrrakʰijjɣ 'will be made corrected'

ɛpatao + a → ɛpataowwa 'will be made shown'

ɛpatobu + a → ɛpatobuwwa 'will be made satisfied'

The data in (8) show that when an unrounded vowel and a rounded vowel followed by /a/, two processes may occur simultaneously, i.e. glide insertion and gemination of /j/ and /w/ respectively. This glide gemination has also influenced the prosody of the word, that is, the geminated glide becomes stressed. This phenomenon is quite different from that which takes place in English, for instance. The difference lies in the fact that there is no glide gemination in English; what occurs in the language is only glide insertion. For example, flowing will be phonetically realized as [fləʊwiŋ] rather than [fləʊwwiŋ], whereas seeing will be realized as [si:jiŋ] rather than [si:jjiŋ].

C.2. Consonant gemination

(9) ɛpabɣndhɣr + a → ɛpabɣndhɣrrɣ 'will be corrected'

ɛpacʰəlləŋ + a → ɛpacʰəlləŋŋa 'will be blackened'

ɛpatɨrros + a → ɛpatɨrrossa 'will be continued'

Consonant gemination or lengthening is also quite prevalent in Madurese. As shown by the data in (9) a consonant tends to be lengthened when it is followed by an unstressed vowel and in such a case, it is also given a primary stress.

Conclusion

All the data provided and discussed above show that there are a number of phonological rules which are applicable to Madurese. The rules which have been discussed in this paper include glottal stop deletion, glottal stop velarization, glottal stop velarization and voiceless alveolar fricative deletion, glottal stop insertion, glide insertion and gemination, and consonant gemination. Like any other rules, some constraints are prevalent. These constraints delimit their domains of application.

As has been elaborated in Section 3.1, glottal stop deletion only applies to Madurese numerals starting from 21 to 29 and their domain of application is restricted to a morpheme boundary, not a word boundary. The same constraint occurs to the phonological phenomenon shown in Section 3.2, in which the glottal stop is velarized when it occurs before /p/ in Madurese numerals beginning from seventy to ninety-nine.

A couple of quite unique and interesting phenomena in Madurese phonology are those which concern glottal stop velarization and voiceless alveolar fricative deletion as discussed in Section 3.3 as well as glottal stop insertion presented in Section 3.4. Glottal stop velarization and voiceless alveolar fricative deletion are unique because the processes look entirely unnatural. At a first glance, it is hard to provide a sound phonological explanation or a rational reason of why the fricative /s/ is deleted when it is preceded by the glottal stop /ʔ/. However, this phenomenon becomes logical, understandable, and clearer as such a deletion is done to set up a friendly conducive environment for the occurrence of the glottal stop velarization. On the other hand, glottal stop insertion is also unique in comparison with other related languages such as Javanese, Sundanese, and Indonesian.

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