

AVOIDING PHONOTACTICALLY INADMISSIBLE L2 SEQUENCES: THE CASE OF SWAHILI LEARNERS

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1. Introduction

Contrastive Analysis (CA) is a theory of second language learning that compares and contrasts two languages in order to establish areas of similarity or difference between them (Wardhaugh 1970: 123). The differences are seen as likely to cause learning difficulty while the similarities are hypothesized to constitute ease in language learning. The controversy surrounding this assumption is well documented (see, for example, James 1971 and 1980, Fisiak 1981, and Wardhaugh 1970). One bone of contention, among the many that are known, has to do with the extent to which CA can predict accurately the problems that a learner is likely to encounter as he or she learns a second language (L2). Most critics of CA point out that the theory lacks predictive accuracy, i.e., it predicts learning problems which do not occur, and that it may not predict problems which do occur. The proponents of CA, on the other hand, have argued that CA has never claimed to be able to predict all problems. They further add that CA claims no more than ability to predict behaviour that is likely to occur with greater than random frequency.

Drawing its data from the pronunciation of Standard Swahili consonant clusters by sixty adult learners from six different ethnic and linguistic backgrounds, this paper shows that in spite of the controversy surrounding the predictive accuracy of CA and indeed its theoretical assumptions, it still remains an important tool of language pedagogy.

2. The sample

In order to study how learners from different linguistic backgrounds respond to an aspect of second language phonology, sixty subjects were selected from six different ethnic and linguistic backgrounds of Kenya. There were ten subjects from each language group. There were thirty women and thirty men aged between twenty

one and twenty eight years. They were all primary school teacher-trainees mainly from three colleges in Kenya.

The subjects were in their second year of study. Swahili was one of the languages they were learning and which they were going to teach upon completion of their course. Besides Swahili, they had also learnt, and were still learning English at the time of the experiment.

Teacher trainees were chosen as subjects for this study because it was assumed that they were a relatively homogenous group of learners who were at the same level of education and relatively exposed to the same learning conditions. Moreover, teacher trainees were chosen, because they were all adults, and, therefore, it was assumed that cognitive factors, e.g., age were not going to be crucial variables in determining the outcome of the study.

In order to make the sample more homogeneous, the choice of the subjects was also based on the following additional criteria:

- that the subjects spoke their L1 in their childhood and still spoke it at the time of the experiment;
- that the subjects had learnt Swahili in both primary and secondary schools;
- that the subjects did not speak other languages besides the L1, Swahili and English.

The above information was collected by the use of a questionnaire (see Appendix A).

3. Data collection

The test material for this study consisted of Swahili words with consonant clusters. The material was chosen on the basis of a preliminary test that had earlier been conducted by the researcher. This is in keeping with Corder (1981: 61) who maintains that the range of choices or judgements and selection of contexts in an elicitation task should be based upon what is known of the learner's language.

Data were obtained in a series of interviews during which subjects were individually recorded by the investigator in a quiet room, using a neck-suspended microphone connected to a recorder, as they performed several tasks. Several tasks were used in order to make sure that the results were reliable and not an artefact of just one task. This is because it has been shown (Beebe 1987) that different elicitation styles (tasks) may influence the results differently.

The data were elicited from each subject for approximately forty minutes. Before the recording began, and in order to minimise anxiety, learners were told that the researcher was interested in making new text books and tapes and was, therefore, concerned with knowing which sound combinations are easy or difficult to pronounce for various groups of speakers. They were further told that the recording was not a test and that they would not receive any grades.

The first task of the study involved reading aloud a word list of Swahili words with consonant clusters; this task also included artificial words. The second task in-

involved the reading of short Swahili sentences. The sentences were specifically written to elicit the pronunciation of consonant clusters. Along with the word list and sentences, the subjects also read two Swahili passages of roughly three hundred words each. The passages were adapted from comprehension books that are used in the lower grades of secondary schools.

In all the tasks, there were two hundred clusters. Some examples of the test material are shown in Appendix B.

One recognizes the limitations of using a formal reading style. Tarone (1979: 184), for example, suggests that the most systematic interlanguage data should be collected informally as the informants go about their normal duties. But while this may be true, the reading method has two main advantages. Firstly, learners are unable to use 'avoidance' as a strategy. It has been found out (Freeman et al. 1991 :26) that learners will often not reveal to researchers their entire linguistic repertoire; rather they will use only those aspects in which they have the most confidence. When the learners are constrained to the use of the reading method, they are unable to avoid difficult items in a test because the very method requires a focus on what is being tested. Thus, the test places some necessary constraints on the learners so that they are compelled to respond to the elicitation tasks. Secondly, the reading method appears to facilitate better quantification of the results and therefore fulfills one of the essential requirements of a good test, namely, scorability.

4. Data analysis

The data were tape recorded and subsequently transcribed. The transcription was done by two evaluators. One of the judges was the researcher himself while the other one was a Swahili native speaker. The native speaker-judge was a second year student at Kenyatta University in Kenya and was familiar with phonetics. This judge was used because it has been observed (Weinreich 1953: 13), that a linguist can be a victim of his own primary sound system when he or she listens to other peoples' pronunciation. Thus in order to take care of any possible shortcomings of the investigator, and in order to generally make the data analysis exercise more reliable, a second judge was used in the transcription of the data.

Each judge transcribed the data individually. Later the two transcriptions were compared. After the transcription, percentages of error were calculated. A group score method (Dulay and Burt 1974: 44-5) was used to compute the error rates per language group. Each language group was assigned one score.

Before we discuss the results, it appears in order to briefly explain some aspects of the L1 and the L2s that are the focus of this study with regard to consonant clusters.

5. The L1s

The language groups from which the subjects were chosen are linguistically divided into two main groups. These are, Bantu (comprising Kikuyu, Kamba and Bukusu) and the Nilotic group (comprising Luo, Nandi and Maasai). (For more in-

formation on the Kenyan languages see, for example, Whiteley 1974, and also Tucker and Bryan 1966; see also Der-Housikian (1972) on Bantu languages). These linguistic groups were chosen because they represent different linguistic classifications and are therefore representative of varied phonological systems from which general tendencies can be observed and generalizations made.

The two language groups discussed above differ in many respects (see, for instance, Whiteley 1974), but for our purpose here, we shall briefly consider how they differ with respect to consonant clusters.

The three Bantu languages (Kikuyu, Kamba and Bukusu) have an open syllable structure. Some of the syllable types found in these languages are: V, CV, CWV (W=semivowel). It is important to state that these languages do not allow consonant clusters (see, for example, Der-Housikian (1972: xvi). On the other hand, the Nilotic languages (Luo, Nandi and Maasai) permit consonant clusters or consonant sequences in their words (see Tucker and Bryan 1966). This latter group has both open and closed syllable structures.

6. The L2 (Standard Swahili)

Although Swahili which is a Bantu language has predominantly an open syllable structure, it has, nevertheless, many consonant clusters or succession of consonants in its words. The nucleus of a syllable in Swahili could, for example, be a syllabic pre-consonantal nasal as shown in (1). It is also important to add that Swahili does not allow monosyllabic nouns (Mpiranya 1995: 39), and stress in this language always falls on the penultimate syllable (see 1).

(1)	<i>m-vi</i>	“grey hair”
	<i>n-ta</i>	“wax”
	<i>n-ne</i>	“four”
	<i>m-mea</i>	“plant”
	<i>m-bwa</i>	“dog”
	<i>m-boga</i>	“edible gourd plant”
	<i>m-cwa</i>	“ant”
	<i>m-pwa</i>	“nephew”
	<i>m-to</i>	“river”
	<i>m-ba</i>	“scarf”
	<i>n-ci</i>	“country”
	<i>m-buni</i>	“coffee tree”
	<i>m-ji</i>	“town”
	<i>amka</i>	“wake up”
	<i>tamka</i>	“pronounce”

A number of other consonant clusters in Swahili are also possible thanks to borrowing from Arabic and English (see 2).

(2)	pl, pr
	bt, bd, bl, br
	tl, tr
	dl, dr
	kt, ks, kl, kr
	gl, gr
	ft
	sl, sr, sk, st
	mp, mt, md, mg, mf, ms, mz, mc, mn, ml, mr
	rt, rd, etc.

Taking into account the varied structures of the two language families as far as consonant clusters are concerned, CA would predict that the learners whose L1s have clusters similar to those that are found in Swahili would make fewer errors in the pronunciation of Swahili words that have consonant clusters. Conversely, those learners whose L1s do not have consonant clusters that are similar to those found in Swahili would have more errors in the pronunciation of Swahili clusters.

7. Results and discussion

The results of the study showed that there were distinct trends in the way the learners from the two linguistic families pronounced Swahili consonant clusters. While the learners from the Nilotic group (Luo, Nandi, Maasai) had very few problems in the pronunciation of Swahili consonant clusters, the learners from the Bantu linguistic group (Kikuyu, Kamba and Bukusu) made many errors as shown in (3).

(3)	Bantu	
	L1	Modification
	Kikuyu	15.39%
	Kamba	13.57%
	Bukusu	21.96%
	Nilotic	
	L1	Modification
	Luo	1.46%
	Nandi	3.07%
	Maasai	3.39%

In order to achieve permissible sound patterns in the pronunciation of L2 words, the learners who speak the languages of the Bantu family used several syllable-restructuring strategies. These are vowels epenthesis, vowel prothesis, consonant deletion and metathesis. It is to these strategies that we shall now turn.

7.1. Vowel epenthesis

One of the methods that the learners (and the only one used by the Bukusu learners) used to circumvent unmatched L2 consonant clusters was vowel epenthesis. By the use of this method, learners inserted a vowel between two consonants in order to break the consonant clusters and thus to achieve a permissible segment order similar to their L1. A high front vowel /i/ was inserted directly before or after alveolars, dentals, palatals and velars. A back vowel /u/ was, on the other hand, epenthesized directly before or after labial segments. In some cases, however, the epenthetic vowel was duplicated from one of the vowels in a word. The insertion of an epenthetic vowel between two consonants had the effect of adjusting the syllable structure of the word in order to bring it into line with the learners' L1 syllable structure (see 4 below):

(4)	L2 Word	Modification	English equivalent
	<i>almasi</i> (VCCVVCV)	<i>alimasi/alumasi</i> (VCVCVCV)	"diamond"
	<i>amri</i> (VCCV)	<i>amuri/amiri</i> (VCVCV)	"order"
	<i>labda</i> (CVCCV)	<i>labuda</i> (CVCVCV)	"perhaps"
	<i>mdudu</i> (CCVCV)	<i>mududu</i> (CVCVCV)	"insect"
	<i>mto</i> (CCV)	<i>muto</i> (CVCV)	"river"
	<i>namna</i> (CVCCV)	<i>namuna</i> (CVCVCV)	"type"
	<i>jamvi</i> (CVCCV)	<i>jamuvi</i> (CVCVCV)	"mat"

7.2. Vowel prothesis

Besides the use of vowel epenthesis, the learners also used vowel prothesis to avoid L2 segment sequences which are inadmissible in their L1s. The prothetic vowel was used in the production of Swahili bisyllabic words beginning with a syllabic nasal. The introduction of the prothetic vowel had the effect of changing the syllable structure of a word as shown in (5):

(5)	L2 Word	Modification	English equivalent
	<i>n-ci</i> (CCV)	<i>i-nci</i> (VCCV)	"country"
	<i>m-bu</i> (CCV)	<i>u-mbu</i> (VCCV)	"mosquito"
	<i>n-zi</i> (CCV)	<i>i-nzi</i> (VCCV)	"fly"
	<i>m-mwa</i> (CCWV)	<i>u-mbwa</i> (V-CCWV)	"dog"

7.3. Consonant Deletion

The learners also resorted to segment deletion in order to cope with L2 consonant sequences. By the use of this method, the learners deleted one consonant in a cluster of two consonants in order to achieve a permissible L1 sequence. The consonants that were frequently deleted were liquids and nasals (see 6):

(6)	L2 Word	Modification	English equivalent
	<i>fursa</i> (CVCCV)	<i>fusa</i> (CVCV)	"chance"
	<i>korti</i> (CVCCV)	<i>koti</i> (CVCV)	"court"
	<i>hulka</i> (CVCCV)	<i>huka</i> (CVCV)	"personality"
	<i>karne</i> (CVCCV)	<i>kane</i> (CVCV)	"century"

It is not in every instance that a CV structure was achieved after the deletion of a consonant in a cluster. In some cases, the learners deleted a consonant and then replaced it with a vowel, or differently stated, they simply changed a consonant into a vowel. Often the lateral was replaced by (or changed into) a back vowel as indicated in (7):

(7)	L2 Word	Modification	English equivalent
	<i>elfu</i> (VCCV)	<i>eofu</i> (VVCV)	"thousand"
	<i>mfalme</i> (CCVCCV)	<i>mufaume</i> (CVCVVCV)	"king"
	<i>almasi</i> (VCCVVCV)	<i>aomasi</i> (VVCVCV)	"diamond"

In other cases, a consonant was deleted and the vowel next to the deleted one was lengthened in compensation (see 8):

(8)	L2 Word	Modification	English equivalent
	<i>elfu</i>	<i>e:fu</i>	"thousand"
	(VCCV)	(V:CV)	
	<i>malkia</i>	<i>ma:kia</i>	"queen"
	(CVCCVV)	(CV:CVV)	

7.4. Metathesis

Another method that the learners used in order to come to terms with the L2 sequences was metathesis. With this strategy, the learners interchanged phonological /AB/ to phonetic [BA] in a word (see 9). This phenomenon was not rule governed and appeared sporadic. It, however, tended to involve words with consonant clusters. Theoretically speaking, there are several motivating factors for the occurrence of metathesis (see Ultan 1988: 96). In this study, however, the motivation seemed to come from the uncertainties of phonotactically inadmissible L2 sequences. Although the rearrangement of segments in some instances did not always result in more familiar sequences for the learners, it was nevertheless an attempt to grapple with an unfamiliar segment sequence.

(9)	L2 word	Modification	English equivalent
	<i>kasri</i>	<i>karsi</i>	"palace"
	(CVCCV)	(CVCCV)	
	<i>silka</i>	<i>sikla</i>	"heredity"
	(CVCCV)	(CVCCV)	
	<i>makisio</i>	<i>masikio</i>	"estimates"
	(CVCVCVV)	(CVCVCVV)	
	<i>skati</i>	<i>staki</i>	"skirt"
	(CCVCV)	(CCVCV)	

A comparison of all the methods used to avoid the pronunciation of Swahili consonant clusters by the Bantu groups is shown in (10) below:

(10)	Kikuyu	Kamba	Bukusu	Total
Epenthesis	8.2%	6.1%	21.96%	36.26%
Deletion	4.6%	5.3%	0	9.9%
Prothesis	1.7%	1.2%	0	2.9%
Metathesis	0.88%	0.97%	0	1.85%
Total	15.38%	13.57%	21.96%	

The most popular method of avoiding consonant clusters was vowel epenthesis followed by consonant deletion which was followed by vowel prothesis. In the first two instances, the learners often achieved a CV syllable structure which is assumed (Hyman 1976: 16) to be basic or unmarked in world languages. The occurrence of vowel prothesis was limited to bisyllabic words beginning with syllabic nasals, in this case a stress carrying vowel was introduced word-initially and the rest of the word was produced as one syllable. Only a few cases of metathesis were noted and the occurrence of this phenomenon was not rule governed.

8. Conclusion

In this paper, we have examined how learners from different linguistic groups respond to an aspect of second language phonology. True to CA predictions, learners whose L1s are phonotactically different from L2 had problems producing the L2 consonant clusters. They resorted to various strategies to circumvent the production of such clusters. This resulted in the creation of preferred syllable structures. On the other hand, learners whose L1s are phonotactically similar to L2 made fewer errors in the production of the consonant clusters. This seems to be attributable to transfer from L1s.

Although the Bantu group of learners resyllatified Swahili words with consonant clusters at higher rates, they did not all resort to the same strategies. While the Kamba and Kikuyu learners used a variety of methods the Bukusu ones exclusively preferred vowel epenthesis. It, thus, appears that different language groups, regardless of how closely related they are, may have different ways of coping with unmatched L2 segments. The principal conclusion that can be drawn from this study is that CA with all its shortcomings is still an important tool in the second language learning situation. CA appears to be still one of the tools that an L2 phonology teacher and a curriculum developer can put into use in the organization of teaching.

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APPENDICES

APPENDIX A

Date of birth.....

Place of birth.....

Years of Swahili learning.....

Languages spoken in childhood.....

Other languages spoken.....

Sex.....

Places lived for more than six months.....

APPENDIX B

Examples of some of the words used in the tests:

namna	maktaba	nargisi
jadhba	fremu	samli
brashi	sharti	afriti
plasta	kabla	shtaka
talkini	elfu	nci
karne	nta	kisamvu
mtu	mto	mti