

Acoustic Analysis Of English Labio-Dental Sounds /F/ And /V/ Produced By Balti Esl Learners

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Abstract

The present study investigates how Balti ESL learners pronounce the English labio-dental /f/ and /v/ at the onset and coda positions of monosyllabic words. For the present study, fifteen out of fifty Balti students were taken randomly from different departments of the University of AJK Muzaffarabad. Monosyllabic word lists having English labio-dental sounds /f/ and /v/ at initial and final positions were made. The participants were asked to read the identified English words having the targeted sounds by using Praat software. The scientific tool, spectrogram was used to analyze the recorded data. The acoustic cues (closure, burst, VOT, frication, voicing, frequency and vowel transition) of the English consonant sounds /f/ and /v/, pronounced by Balti ESL learners, were explored. The study reveals that the English labio-dental phonemes /f/ and /v/ are problematic for Balti ESL learners, /f/ is pronounced / as /ph/ at monosyllabic words initial, and final positions, while /v/ is pronounced as /w/ at words initial, and final positions by Balti ESL learners. The study implies that Balti ESL learners are needed to be trained properly to pronounce the English labio-dental /f/ and /v/ sounds. The study will be helpful for Balti speakers in teaching and learning English pronunciation. It also contributes to investigating the cross-linguistic features of Balti and English.

Key Words Acoustics, Labio-dental, Balti, Pronounced, Analysis, ESL Learners

Introduction

Balti language is spoken by the people who reside in Baltistan; the northern region of Pakistan and in Ladakh, the region of India (Backstrom, 1992). This is one of the major languages of Gilgit Baltistan, where about half-dozen languages are spoken namely Balti, Sheena, Burushaski, Khowar, Wakhi, and Pashto. Interestingly, these languages are polls apart from each other, although the speakers of these languages reside closely to each other there are huge differences among the languages. It is noteworthy that out of these languages, only Balti is Tibeto-Burman language that belongs to the Western Tibetan sub-family, which also includes Ladakhi, Puriki , and Zangskari(Sprigg, 2002).The other mentioned languages belong to Indo-Aryan except Burushaski which does not belong to any of the known families. All of these languages have two or three dialects (Hussain, 2010). So, Gilgit Baltistan is rich of languages and aptly called it one of the most multilingual places of the world (Backstrom, 1992).

Balti has a dominating status of being spoken in all areas of one of the two divisions of Gilgit Baltistan. The Baltistan division consists of four districts; Skardu, Ghanche, Kharmang, and Shigar. Each district has its own peculiar dialect. Among these dialects there are more phonological differences than lexical and morphological (Backstrom,1992).The researchers will not go into the detail of the origin, history and nature of Balti language because the researchers' main concern in the present study is one of the phonological aspects of Balti language. The present study deals with phonological aspect, which has not been properly explored yet, of the language. Therefore, in the present study phonemic inventory of Puriki. It has 39 consonants lacking English labio-dental sounds (Sharma, 2004). The present study is restricted to English labio-dental consonant sounds /f/ and /v/. Other English consonants are not included which might cause problem for Balti ESL learners.

Objectives

1. To analyze the ways of pronouncing English labio-dental consonant sounds /f/ and /v/ by Balti ESL learners?
2. To find out the first language interference in pronouncing English labio-dental consonants by Balti ESL learners.

Research questions

1. How do the Balti ESL learners pronounce English Labio-dental sounds /f/ and /v/ at the initial, middle and final positions of words?
2. What are the first language interferences in producing English labio-dental sounds?

Significance

This study is very fruitful and beneficial for Balti ESL teachers and students especially for the development of Speaking Skills. This study is much important for future researchers as it successfully investigates the cross linguistic features of English and Balti at phonological level

Literature review

Balti is a unique and different language, but has been the least subject of linguists. There are only few scholarships available. In the literature review the origin, script, and dialects of the language will be discussed briefly. These components are necessary to understand the nature of the language. The main focus here will be on the phonology of Balti language. Due to unavailability of Balti phonemic inventory, the Puriki inventor has been employed as evidence, because there are 90% similarities between the two varieties (Sharma,2004).

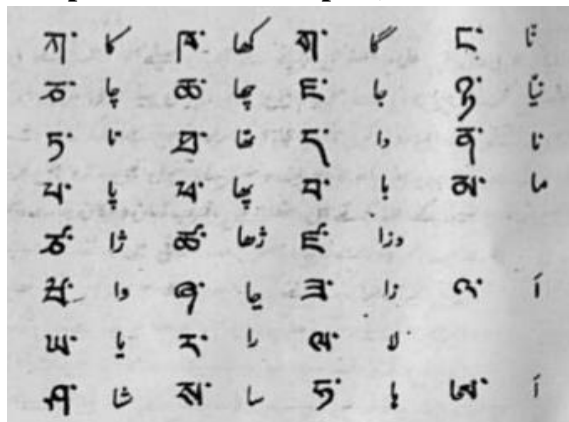
Origin of Balti language

Balti belongs to the Western Tibetan branch of the Tibeto Burman family (Backstrom, 1992).Balti refers to the language itself and its speakers. Ptolemy, the second century astronomer and geographer documented the name as Baltae means ‘water gorge’ in Greek (Afridi, 1988).

Scripts

Balti has two distinct scripts; Old-Tibetan and Perso-Arbic. Before the arrival of Islam, the Old-Tibetan script was in practice, but it was replaced by Perso-Arabic when people were converted to Islam by well-known Muslim preacher, Shah Syed Muhammad Noor Bakhsh(RH) (Backstrom, 1992). All the latest Balti literature including lyrics, elegies, Qasida (eulogy), dramas, poems etc are written in Perso-Arabic script. Now, the Old-Tibetan script is not in practice at all. Only a few people know that script. There are only a handful of Balti educated people who know how to read and write the Old- Tibetan script(Backstrom, 1992)

Sample of both the scripts (Hussainabadi, 1990)



Dialect Variation

Compared to other regional languages, Balti shows uniformity in its vocabulary across Baltistan. There is more a phonological difference than the lexical one though they are not much considerable in communication generally. Balti has six varieties; Chorbat, Khaplu, Kharmang, Shigar, Skardu and Rundu. Among these six, there is a little lexical difference as the varieties share more than 90% similarities but these varieties have surprising phonological differences

(Backstrom,1992).

On the other hand, there are differences of opinion that whether Balti and Puriki are two different languages or simply two varieties of the same language. The two varieties share a large percentage of similarity but there are some differences in lexical items and usage (Backstrom, 1992). Puriki is a variety between Ladakhi and Balti and considered it a form of Balti(Rangan, 1975). Puriki and Balti share 90% similarities (Sharma, 2004).

Consonant chart

Phonology of Balti is the most ignored aspect due to which there is no phonemic inventory of Balti consonant available. Fortunately, the researchers could find the phonemic inventory of Puriki which is the most similar to Balti. So, the consonantal chart of Puriki is given below because it serves the purpose having all the consonant sounds of Balti.

Chart of Balti consonant phonemes adapted from(Sharm, 2004)

		Place of Articulation						
		Bilabials	Dentals	Palato-Alveolar Affricates	Palatal Affricates	Retroflex	Velars	Glottals
Manner of Articulation	Plosive (vl.) (vd.)	p, ph b	t, th d		c, ch j	t, th d (r)	k, kh g	q, x g
	Affricates (vl.) (vd.)			č, čh j				
	Nasals	m	n		ɲ		ŋ	
	Vibrants					r		
	Laterals(unasp.) (Asp.)		l (lh)			ɭ		
	Fricatives (vl.) (vd.)		s z	š ž	ś z	(s)	h	
	Semi-Vowels	w			y			

Balti Bilabial

Balti has five bilabial consonant phonemes/p/, /ph/, /b/, /m/, and /w/. The /p/, /ph/, and /b/ consonant phonemes are bilabial plosive. While /m/ is nasal and /w/ is glide. Unlike English in Balti /ph/ is a distinct phoneme.

Balti Dental

The language has seven dental consonant phonemes /t/, /th/, /d/, /n/, /l/, /s/,/z/. There are three dental plosives /t/, /th/, /d/, one dental nasal /n/ and two dental fricatives /s/, /z/.

Balti Post alveolar

Balti has five post-alveolar consonant phonemes /č/, /čh/, /j/, /š/, / ž/. The post-alveolar /č/, /čh/, /j/, are affricates and /š/, / ž/ are fricatives.

Balti palatal

There are seven palatal sounds in Balti. Out of these seven, there are three plosives /c/, /ch/ and /j/, one nasal /ñ/, two fricatives /š/, /z/ and one glide /y/.

Balti retroflex

Balti has seven retroflex consonant phonemes. Among these, three are plosives /ɖ/, /ɗ/, /ʈh/, one vibrant /ɾ/, one lateral /ɭ/ and one fricative /ʂ/.

Balti Velar consonants

Balti has five velar consonants. There are three velar plosives /k/, /kh/ and /g/. There is only one nasal /ŋ/ and one fricative /h/.

Balti Glottal

Balti has three glottal plosives /q/, /x/ and /g/.

Balti has 39 consonant phonemes lacking English labio-dental /f/ and /v/.

Research methodology

The research design is quantitative as the findings have been quantified to get the results and conclusion. In the study, percentage has been used to calculate the results. The given below sections give the details of the methodology.

Total population

All the Balti native speakers are the total population of the present study.

Target Population

The target population is made up of Balti-native students pursuing different academic courses at BS level in different departments at UAJK.

Participants

Data was collected from a sample of participants who were studying at the UAJK. Random sampling technique was used for selection of participants; fifteen out of 50 students were selected for recordings. A list of the students was prepared, wrote each name on a piece of paper and selected 15 out of 50 randomly.

Data Collection Procedure

Lists of English Monosyllabic words (having English Labio-dental sounds at onset and coda positions) were prepared. Each list consisted of twenty words and the participants were asked to produce each word of the list three times and recorded them. The total token for each sound has become 300.

Research Tools

The recordings were analyzed through computer software (PRAAT). Acoustic cues of different sounds were obtained. The findings and results were displayed on spectrogram, pie chart and tables.

Findings

The collected data was analyzed by using Computer Software Praat and gathered the results. In the first section the English Labiodental sound /f/ at syllable onset and coda positions pronounced by Balti ESL learners was investigated and in the second section English Labiodental /v/ sound at syllable onset and coda positions was investigated. The results of the investigation are the following:

Section 01.

Pronunciation of /f/ at syllable initial and final position

/f/ was pronounced as /p^h/ at syllable's onset position

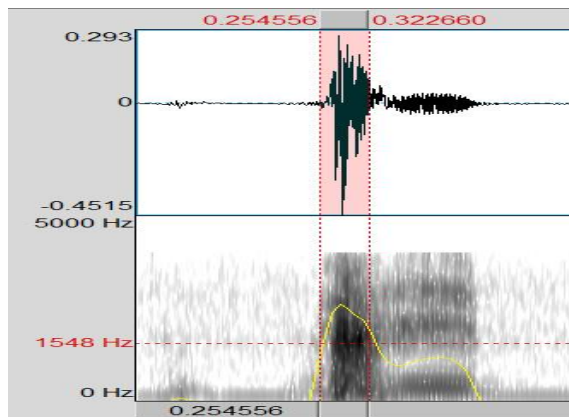


Figure no 1: /f/ pronounced as /p^h/

The above spectrogram shows that the English labio-dental /f/ was pronounced as /p^h/ in the word 'fit' by Balti speakers. It shows that the air was completely blocked as the burst is clear at the spectrogram. After the burst there is a vivid puff of air. The darkest area in the spectrogram shows extra puff of air. In the realization of normal English labio-dental sound /f/ there is no complete closure but the spectrogram reveal that there is complete closure as the burst is evident. This makes it confirm that instead of leaving a narrow gap between the two articulators Balti speakers bring the two articulators in firm contact and makes the sound stop instead of fricative.

/f/ was pronounced as /f/ at syllable's onset position

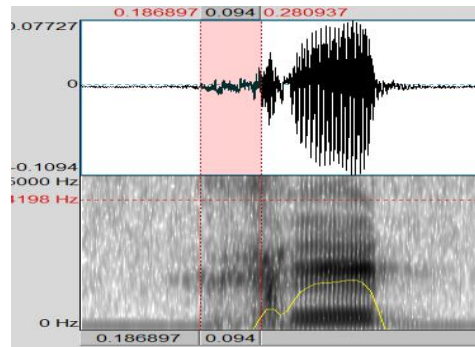


Figure no 02 t /f/ was pronounced as /f/

The above spectrogram shows that /f/ was pronounced as /f/ by Balti speakers in the word ‘fit’. The acoustic cues of /f/, frication and lower and upper frequencies are clearly visible. The duration of frication is shaded in the above spectrogram. It shows that the lower frequency is 4193Hz, while the upper frequency is more than 5000Hz

/f/ was pronounced as /p^h/ at syllable’s coda position

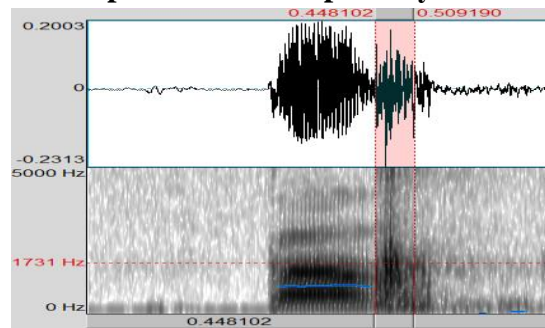


Figure no 03 showing the pronunciation of /f/ as /p^h/

The above spectrogram shows that /f/ was pronounced as /p^h/ in the word ‘puff’. Extra puff of air reflects aspiration due to which VOT is not clear.

/f/ was pronounced as /f/ at syllable’s coda position

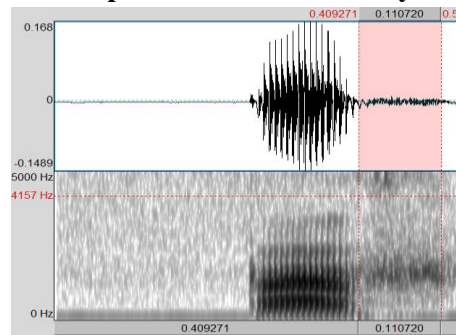


Figure no 8: /f/ pronounced as /f/

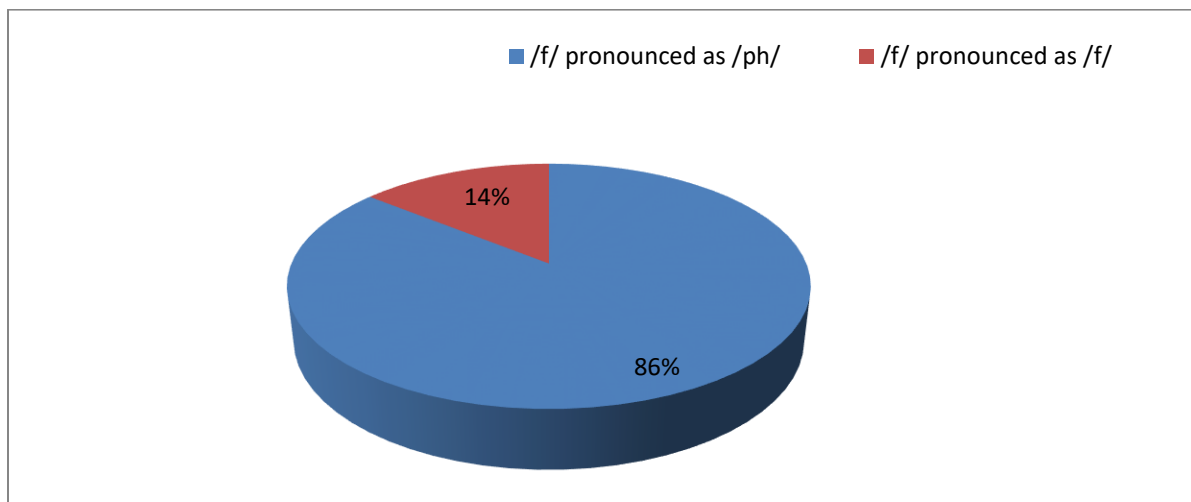
The above spectrogram shows that there is frication which duration is 0.1107. The lower frequency is 4157Hz and upper frequency is more than 5000Hz. There is no voicing bar during the shaded friction duration.

Table no.01

VARIANTS	ONSET	CODA
Pronounced as /ph/	260	255
Pronounced as /f/	40	45
Total Tokens	300	300

The above table no.01 reveals that /f/ was pronounced as /ph/ 260 times at syllable onset position, and the it was pronounced as /f/ 40 times.. It was pronounced as /ph/ 255 times and /f/ 45 times at syllable coda position respectively.The result is clearly evident that the sound is problematic for Balti ESL learners at syllable onset and coda positions. The results can be illustrated in the form of pie char with percentage in the given below chart no.01

Chart no.01



The above pie chart shows that only 14% of the participant correctly pronounced the English Labio-dental sound at /f/ at syllable onset and coda position while 86% of the participants pronounced it as /ph/. The result shows that the sound is problematic for Balti ESL learners.

Section 2: Pronunciation of /v/ at syllable onset and coda positions /v/ at words syllable onset position

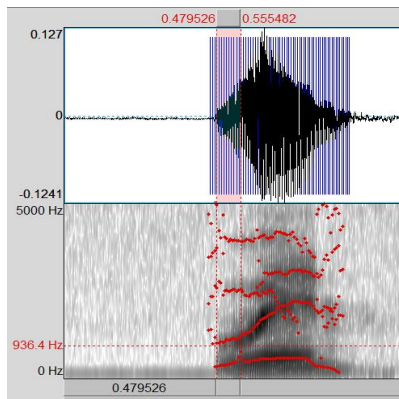


Figure no 05 : /v/ was pronounced as /w/

The above spectrogram reveals the acoustic cues of the glide /w/. It shows that F2 and F3 are rising in the vowel transition at off-set position. Here there are vowel-like formants. There is a big gap between F1 and F2 after vowel transition. F1 is 414 and F2 is 1060. All the acoustic cues suggest that the sound was pronounced as /w/

The pronunciation of /v/ at words final positions

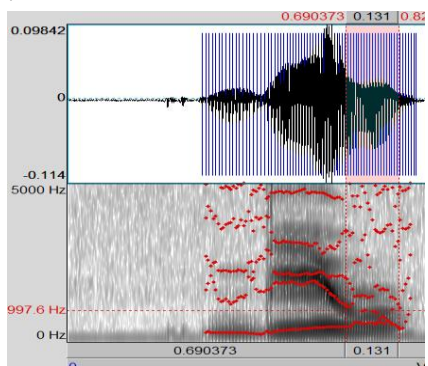


Figure no 06 The pronunciation of /v/ as /w/

The above spectrogram reveals the acoustic cues of /w/ as F2 sharply falls at onset, F3 also falls at onset and F1 rises. During the realization of /w/ F2 and F1 come close to each other. F1 is 490 Hz and F2 is 1072 Hz.

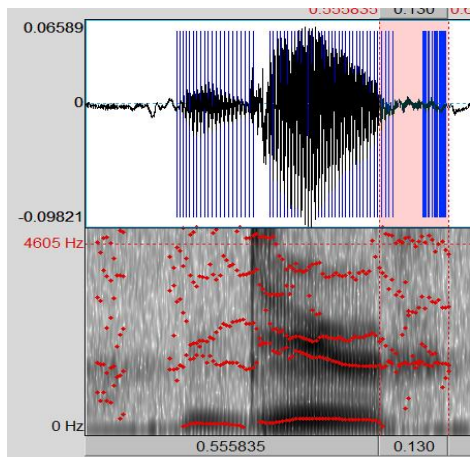


Figure no 07 the pronunciation of /v/ as/v/.

The above spectrogram shows that there is duration of friction where the vowel transitions are smooth. During the friction there is vivid voicing bar.

VARIANTS	ONSET	CODA
Pronounced as /w/	238	257
Pronounced as /v/	52	43
Total Tokens	300	300

The table shows that /v/ was pronounced as /w/ 238 times and 52 times as /v/ at syllable onset position while the same sound was pronounced 257 times /w/ and 43 times as /v/ syllable coda position respectively. The result can be illustrated in the form of percentage in the given below pie chart.

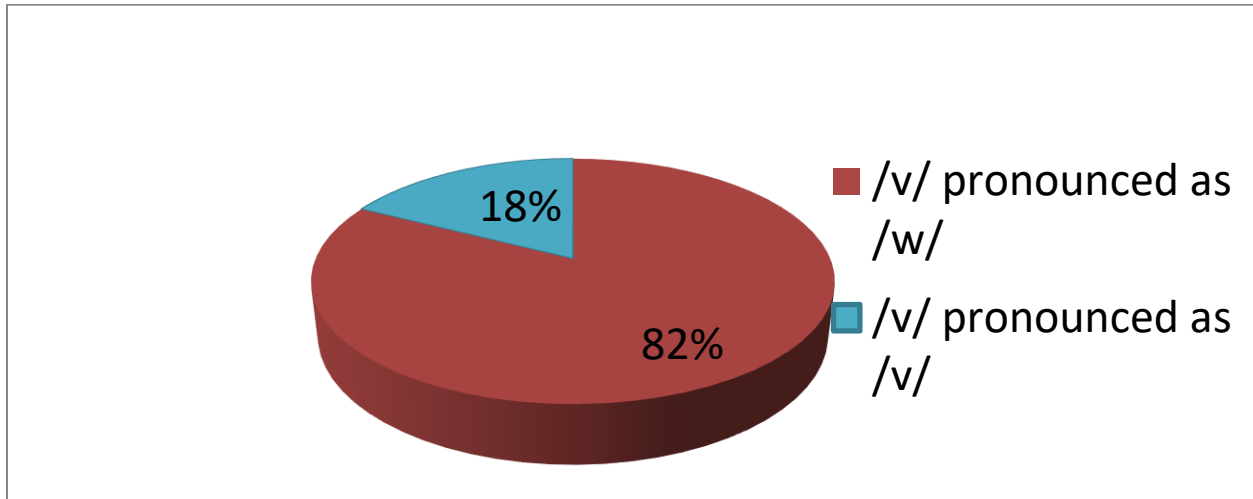


Chart No.02

The above pie chart illustrates that English Labio-dental sound /v/ is problematic for Balti ESL learners as 82% of the participants mispronounced the sound at syllable onset and coda positions while only 18% of them correctly pronounced the sound.

Discussion

The English labio-dental /f/ and /v/ are problematic for Balti ESL learners, because of the phonological differences of the two languages. The problematic English consonants /f/ and /v/ are labio-dental which are missing in Balti language as shown in the phonemic inventory given in the literature review and as a result, the Balti speakers replace the English voiceless labio-dental /f/ with Balti aspirated bilabial plosive phoneme /ph/. As for as, English voiced labio-dental /v/ is concerned, it is replaced with Balti bilabial glide /w/.Balti language has 39 consonant phonemes lacking English labio-dental /f/ and /v/.In Balti language there is no /f/ and v/ at all, so, Balti speakers pronounce the English labio-dental sounds with different place of articulation and manner of articulation. Balti has dental /t/, /d/, /s/, /z/, /n/ and /l/ in the place of English alveolar sounds. In the present study only English labio-dental /f/ and /v/ have been discussed, the alveolar phonemes also might create problems for Balti ESL learners. In Balti language fifteen consonants are more than that of English. So, the fifteen consonant sounds might create problem for English speakers in learning Balti. Although the two sounds are problematic for Balti native speakers, they can be correctly pronounced with much practice and exercise as 14% of the participants correctly pronounced the /f/ sound and /18/% correctly pronounced the /v/ sounds at syllable onset and coda positions. But it is unknown that why the small portion correctly pronounced the sounds. It is one of the limitations of the study that the researchers could not go into the background education of the participants.

Conclusion

From the analysis of data, it is deduced that Balti ESL learners have problems in pronouncing the English labio-dental consonant phonemes /f/ and /v/. The Balti ESL learners replace the problematic English labio-dental consonant /f/ with the aspirated Balti bilabial plosive phoneme /ph/ and voiceless bilabial plosive /p/. As far as the voiced labio-dental /v/ is concerned, it is replaced with /w/ at words initial, middle and final positions by Balti ESL learners.

The study concludes that Balti ESL learners' performance is affected by the phonological gap between the two languages. The present study has proved that the phonological gap between the two languages must be kept in view while teaching and learning English as a second language. The study suggests that particular attention should be given to English labio-dental sounds /f/ and /v/ while teaching English as a second language to Balti speakers. It suggests that special practice should be given to Balti ESL learners to pronounce English labio-dental sounds like native speakers. This study is limited to English labio-dental /f/ and /v/ sounds. It suggests that other phonological differences are to be investigated. It is the limitation of the study that due to time and resource constraints the researchers could not go to Baltistan to take participants.

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