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Description and Classification of Balti Consonant Stop Sounds

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ABSTRACT

The study aims to describe and classify consonant stop sounds of the Balti language, which is spoken in Gilgit-Baltistan, Pakistan. In order to describe and classify these sounds, 120 words were selected from literature written in the Balti language. A purposive sample of 20 Balti speakers from 16 to 35 years of age, who were studying in various degree programs at Government College for Boys, Model Town, Lahore and University of Management and Technology, Lahore, was selected to record possible Balti consonant stop sounds. The physical features of each consonant stop sound were carried through the software package for speech analysis in phonetics. The study reveals that there are 15 consonant stop sounds in the Balti language. The study helps document the Balti language, which follows mostly a verbal tradition like many other languages of the region.

Keywords: Balti language, Balti consonant sounds, description and classification of Balti language

Introduction

In the extreme north of Pakistan, Baltistan is firmly upright with the unparalleled magnitude of mountainous ranges. Lofty snow-falling glaciers surround the region. The beautiful ranges add to the glory and splendor of this place and the enriched history of distinguished language, and culture. A fair number of people from this region speak Balti as their first language. The Balti language is from the family of Sino-Bodic language spoken in the Himalish region and Tibeto- Burman of Sino-Tibetan. The richness of this language can be noticed from the fact that it is the second chief clan compared to other language families.

It is important to note that there is little research on the Balti language. The initial work in this regard is by Godwin-Austen (1866), who is considered the famous surveyor of the Karakoram Mountains. He is the first European to publish a book on the vocabulary of the Balti language. Bailey (1915) added a more detailed grammatical outline and vocabulary of Purki. As compare to these researchers, Read (1934) published the most extensive grammar of Balti to date, along with the words list of 2,000 words. Some forty years later, Rangan (1979) added a phonology and grammar of Purki (a dialect of Balti). Rangan's contribution is the most accurate work, as his predecessors were mostly unaware of the nature of certain sounds found in Balti and Purki, particularly the palatal nasal [n], which they recorded as [n], [K], [ny], or [Ky] (Backstrom,1992).

Jaschke (1983) established that many Balti words were initially being derived from the Hindi language. In the same vein, he found that many Balti sounds were comparable with the

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Hindi language. Moreover, he noted 30 Balti consonant letters and four diacritics symbols for Balti vowel sounds. Jaschke (1983) did not prove these sounds based on scientific evidence; however, he considered the letters as sounds. There is a disagreement among researchers over the exact number of sounds in the Balti language, as investigated by Yousuf (2009).

This study is an attempt to explore Balti consonant stop sounds. It is hoped that this study may serve to finalize the phonemic inventory of the Balti language. Last but not least, this study will help to formulate a syllabus of the Balti sound system in the foreseeable future for the formulation of proper curriculum or syllabus – a small step towards revitalizing the Balti language that is enlisted among the endangered languages of Pakistan.

Research Questions

- How many consonant stop sounds are in the Balti language?
- What are physical features (voicing, aspiration, manner, and place of articulations) of Balti consonant stop sounds?

Methodology

Participants

To conduct this particular study, the researcher selected 20 native Balti speakers between the age group of 16 to 35 studying in the Govt. College (boys) Model Town and University of Management and Technology, Lahore Pakistan.

Procedure

In order to classify Balti consonants, 120 different words were selected from different Balti books. Acoustic analysis of Balti consonants is carried out through PRAAT software. The minimal pairs were made to check the existence of different sounds. The sounds were analyzed with the help of spectrograms to find their manners of articulation.

Analysis

The Minimal Pair for /p/, /b/ and /p^h/ Sounds

The existence of /p/, /b/ and /p^h/ phonemes in the Balti language is checked through the following minimal pairs demonstrated in table 1.

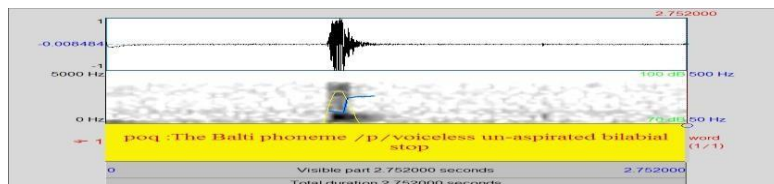
Table 1. The minimal pair for /p/, /b/ and /p^h/ sounds with their meanings

Minimal Pairs	Transcription	Meaning
poq	/poq/	A place which is a bit up
Boq	/boq/	very
p ^h oq	/p ^h oq/	fall

The above minimal pairs show that the phonemes /p/, /b/ and /p^h/ exist in the Balti language. The minimal pairs show that aspiration does not mark an allophonic contrast in English; instead, aspiration marks phonemic contrast in Balti.

Voiceless Bilabial Stop /p/

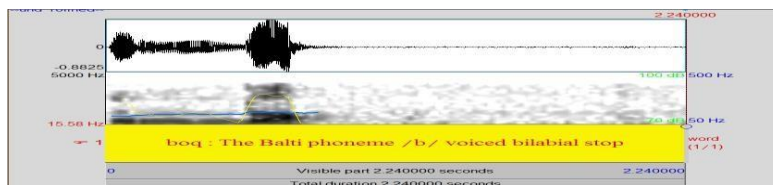
The phoneme /p/ is voiceless un-aspirated bilabial stop in the Balti language. In its articulation, both lips are closed to gather to obstruct the airflow, as shown in the spectrogram (a) followed by sudden releases of airstream without aspiration, as shown in the spectrogram (a). The minimal pairs show that /p/ and /p^h/ are two different sounds in the Balti language. One is aspirated, i.e., /p^hong/ (through) and other is un-aspirated, i.e., /pong/ (this word is used to show/ indicate any cast in Balti) just like the English phoneme /p/ and /p^h/. Nevertheless, English has allophonic contrast, while Balti has phonemic contrast. If the /p/ sound is replaced with aspirated phoneme /p^h/ in the Balti language, then the meaning of the word will be changed. The example is mentioned above. Moreover, no vibration has been observed in the production of /p/ sound during acoustic analysis. Therefore, /p/ is a voiceless bilabial stop.



The spectrogram (a) of phoneme /p/

Voiced Bilabial Stop /b/

The phoneme /b/ is voiced bilabial stop in the Balti language. To produce the phoneme /b/, both lips are closed together to obstruct the air, as shown in the diagram (b) followed by suddenly releases of airstream without aspiration shown in the spectrogram (b). It has been observed that /b/ is pronounced by the Balti native speaker, just like the English phoneme /b/. Therefore, the phoneme /b/ is bilabial. On the other hand, the manner of articulation is voiced, stop. During the acoustic analysis of this phoneme, a stable vibration is observed shown in the spectrogram (b).

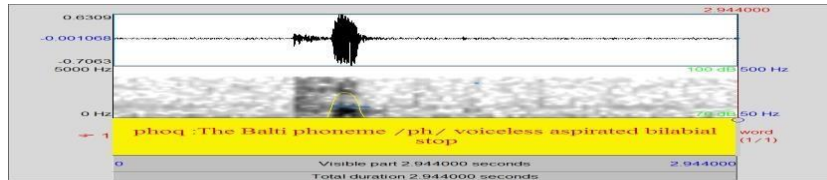


The spectrogram (b) of phoneme /b /

Voiceless Bilabial Stop /p^h/

The phoneme /p^h/ is a voiceless aspirated bilabial stop. To produce the phoneme /p^h /, both lips are closed to obstruct the airflow, as shown in the diagram (c) followed by sudden releases of the airstream with strong aspiration, as shown in the spectrogram (c). Moreover, the phoneme /p/

and phoneme /p^h/ are two different phonemes in the Balti language. The minimal pairs show that when the Balti native speakers produce the phoneme /p/ un-aspirated, it gives a different meaning as compared to when the phoneme is produced with aspirated /p^h/ sound, i.e., such as /pong/ un-aspirated phoneme /p / and /p^hong/ aspirated phoneme /p^h/. No vibration is observed by the researchers while producing the phoneme /p^h/ during acoustic analysis shown in the spectrogram (c). Therefore, /p^h/ is a voiceless, aspirated stop in Balti.



The spectrogram (c) of phoneme /p^h/

Minimal Pairs for the Phonemes /t/, /d/ and /t^h/

The existence of the phonemes /t/, /d/ and /t^h/ in the Balti language is checked through the following minimal pairs in table 2.

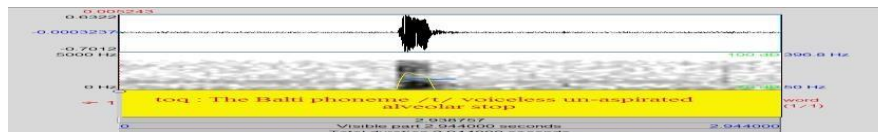
Table 2. Minimal pairs for the phonemes /t/, /d/, and /t^h/

Minimal Pairs	Transcription	Meaning
toq	/təuq/	hill
Doq	/dəuq/	pod
t ^h op	/t ^h op/	dark

The above minimal pairs show that the phonemes /t/, /d/ and /t^h/ exist in the Balti language. The minimal pairs show that aspiration does not mark an allophonic contrast as it does in English; instead, aspiration marks phonemic contrast in Balti.

Voiceless Alveolar Stop /t/

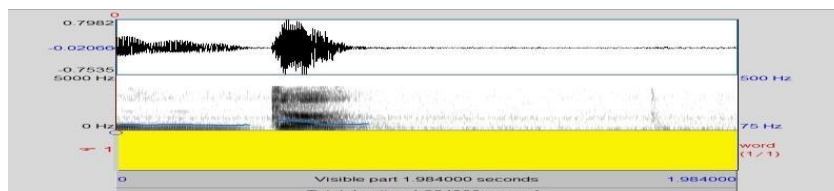
The phoneme /t/ is a voiceless un-aspirated alveolar stop in the Balti language. To articulate this phoneme, the tip of the tongue touches the alveolar ridge shown in the diagram (d), just like the English phoneme /t/ as in the word /ten/. When the tip of the tongue touches the alveolar ridge, the air stops first for a while and follows by a sudden release of airstream without aspiration, as shown in the spectrogram (d). The phoneme /t/ can be produced with aspirated and without aspirated by the Balti speakers. When the phoneme /t/ is produced by the native speakers of the Balti language without aspiration, it gives different meaning from producing it with aspiration, e.g., /top/ (break something with force) and /t^hop/ (dark). No vibration has been observed during the acoustic analysis of this sound. Therefore, this phoneme is a voiceless sound.



The spectrogram (d) of phoneme /t/

Voiced Alveolar Stop /d/

The phoneme /d/ is a voiced un-aspirated alveolar stop in the Balti language. In the articulation of this phoneme, the tip of the tongue touches the alveolar ridge, as shown in the diagram (e), just like the English phoneme /d/. When the tip of the tongue touches the alveolar ridge, the air stops first, followed by sudden releases of the airstream without aspiration to see in the spectrogram (e). Therefore, this phoneme is an alveolar stop in the Balti language. A stable vibration has been observed during the acoustic analysis. Therefore, the phoneme /d/ is voiced.



The spectrogram (e) of phoneme /d/

Voiceless Alveolar Stop /t^h/

The phoneme /t^h/ is a voiceless aspirated alveolar stop in the Balti language. In the articulation of this phoneme, the tip of the tongue touches the alveolar ridge, as shown in the diagram (f). When the tip of the tongue touches the alveolar ridge, the air stops first, followed by the airstream releases with a strong aspiration shown in the spectrogram (f). Moreover, it can also be produced with un-aspirated, just like in the English language. English has allophonic contrast, but Balti has phonemic contrast because, in the Balti language, both (aspirated and un-aspirated) sounds give different meanings. Therefore, the phoneme /t/ and /t^h/ are two different phonemes in Balti. Moreover, no vibration has been observed during acoustic analysis. Hence, this sound is voiceless.

The spectrogram (f) of phoneme /t^h/



Minimal Pairs for /k/, /g / and /k^h/ Sounds

The phonemes /k/, /g/ and /k^h/ is checked through the following minimal pairs enlisted in table 3.

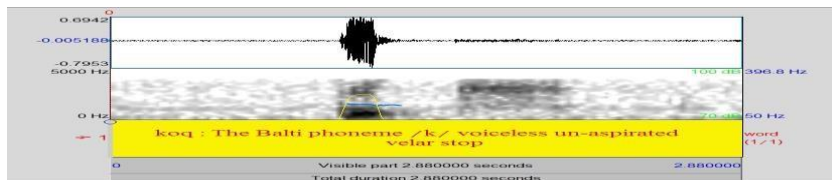
Table 3. Minimal pairs for /k/, /g / and /k^h/ sounds

Minimal Pairs	Transcription	Meaning
Koq	/kəʊq/	snatch
goq	/gəʊq/	apart
k ^h oqs	/k ^h oqs/	cuff

The above minimal pairs show that the phonemes /k/, /g/ and /k^h/ exist in the Balti language. The minimal pairs show that aspiration does not mark an allophonic contrast as it does in English; instead, aspiration marks phonemic contrast in Balti.

Voiceless Velar Stop /k/

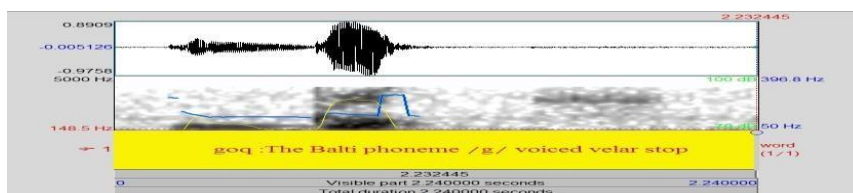
The phoneme /k/ is a voiceless un-aspirated velar stop in the Balti language. It can be produced with aspiration and without aspiration, just like the English un-aspirated /k/ and aspirated /k^h/. English has an allophonic contrast, but Balti has phonemic contrast. In the articulation of this phoneme, the back of the tongue produces this sound with the soft palate, as shown in the diagram (g). When the back of the tongue touches with the soft palate, the air stops for a short while, followed by a sudden release of the airstream without any aspiration. Moreover, no vibration has been observed while producing this sound during acoustic analysis. Therefore, this is a voiceless sound. This sound can occur at the word-initial, middle, and final position of the Balti language.



The spectrogram (g) of phoneme /k/

Voiced Velar Stop /g/

The phoneme /g/ is a voiced velar stop sound in the Balti language. In the articulation of this phoneme, the back of the tongue touches the soft palate shown in the diagram (h). When the back of the tongue touches the soft palate, the air completely stops first, followed by a sudden release of the airstream without any aspiration, as shown in the spectrogram (h). A stable vibration has been observed during acoustic analysis. Therefore, this is a voiced sound.



The spectrogram (h) of phoneme /g/

Voiceless Velar Stop /k^h/

The phoneme /k^h/ is a voiceless aspirated velar stop in the Balti language. In order to produce this sound, the back of the tongue touches the soft palate, as shown in the diagram (i). It can be produced with aspiration and without aspiration. /k/ un-aspirated and /k^h/ aspirated just like the English phoneme /k, k^h/. However, English has an allophonic contrast. In English, whether the phoneme /k/ is pronounced aspirated or without aspiration, the meaning will not be changed. On

the other hand, Balti has phonemic contrast. If we produce this phoneme without aspiration, e.g. /koqs/ (snatched) meaning will be different from the phoneme /k^h/ with aspiration, e.g. /k^hoqs/ (cuff). Moreover, no vibration has been observed during the acoustic analysis of this phoneme shown in the spectrogram (i). Therefore, this phoneme is a voiceless sound.



The spectrogram (i) of phoneme/k^h/

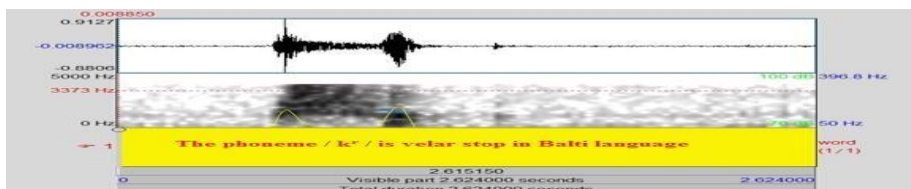
Minimal Pairs for /k^r/ and /g^r/ Sound

The phoneme /k^r/ and /g^r/ have been checked through the following minimal pairs.

Minimal Pairs	Transcription	Meaning
K ^h raq	/k ^r əq/	blood
g ^{hr} əqs	/g ^r əqs/	agreed

Voiceless Velar Stop /k^r/

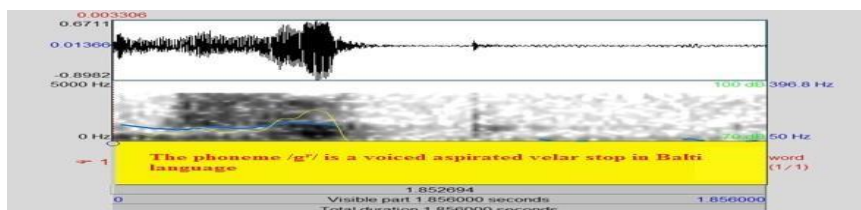
The above minimal pairs show that the phonemes /k^r/ and /g^r/ exist in the Balti language. The phoneme /k^r/ is velar stop in Balti language. In the articulation of this phoneme, the back of the tongue touches the soft palate, as shown in the diagram (j). When the back of the tongue touches the soft palate, the air is stopped, followed by a sudden release of the airstream with a strong aspiration. In the production of this sound, no vibration has been observed during acoustic analysis. Therefore, this phoneme is a voiceless.



The spectrogram (j) of phoneme /k^r/

Voiced Velar Stop /g^r/

The phoneme /g^r/ is a voiced aspirated velar stop in the Balti language. In the articulation of this phoneme, the back of the tongue touches the soft palate, as shown in the diagram (k). When the back of the tongue touches the soft palate, the air is stopped first, followed by a sudden release of the airstream without aspiration. In the production of this sound, stable vibration has been observed during acoustic analysis. Therefore, this is a voiced sound.



The spectrogram (k) of phoneme /gʳ /

Conclusion

The study finds that there are 15 stop phonemes in the Balti language. These are /p/, /b/, /p^h/, /t/, /d/, /t^h/, /t/, /d/, /t^h/, /k/, /g/, /k^h/, /k^{hr}/, /gʳ /, and /q/. During the production of these sounds, the air stops at different places of the vocal tract and then is suddenly released with or without aspiration. Moreover, the phoneme /p, t, k/ and /q/ are the voiceless un-aspirated. No voicing and aspiration are realized in these sounds. On the other hand, /p^h/, /t^h/, /k^h/, and /k^{hr}/ are voiceless aspirated sound. During the analysis of these sounds, no voicing and vibration is observed. Only aspirations are realized. In addition to this, during the articulation of phoneme /b/, /d/, /d/, /g/, and /gʳ/, a strong vibration is observed.

Limitation of the Study

The study limits to the description and classification of consonant stop sounds of the Balti language. The researchers suggest investigating vowel sounds, phonological reconstruction and syllable structure of the Balti language as a direction for future researchers.

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