

Phonetic Variations in Yousafzai Dialect: A Corpus-Driven Phonetic Analysis of Thanewal Accent

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Abstract

This research study aims to identify and understand the rules that govern the phonetic variation in the Thanewal accent of the Yousafzai dialect of the Pashto Language. This study is the pioneer study in observing the phonetic variation of the Thanewal accent. The Thanewal accent is spoken by thousands of people in Thana town of district Malakand. The researchers in the current study have collected data through the focus group technique of data collection with 7 participants belonging to Thana. A list of 50 words (nouns, pronouns, verbs, and adjectives) has been identified, showing potential deviation from the normal Yousafzai dialect. The data analysis shows that the people in Thana deviate from the normal Pashto accent when pronouncing certain verbs, nouns, adjectives, and pronouns. Therefore, this corpus-based research study considers the accent spoken in Thana separate and distinct from other accents spoken in the Pashtun belt of Southeast Asia.

Keywords: Phonetic Variation, Pashto, Thana, Yousafzai Dialect, Corpus, PRAAT.

Introduction

Phonetic variation is a broader term used to define the differences in the pronunciation of certain sounds, such as vowels and consonants. Crystal (2008) divides the phonetic variations into two

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macro-categories such as segmental and suprasegmental. The segmental variation comprises variations in consonants and vowels. While the suprasegmental variation occurs in intonation and stress. Furthermore, according to the study of Wang et al. (2015), the segmental level of phonetic analysis mainly focuses on the vowel-consonant and vowel sound variations in a language. Therefore, the current study in this regard is of great importance as it will look at the variation in vowel sounds of the Thanewal accent of the Pashto language especially focusing on word sounds ending with /ə/ /ə/ and / ʊ/ /ʊ/.

Ladefoged and Johnson, (2014) in their study describe the manner of segmental variation. They concluded that when it comes to variation in consonant sound researchers should look at the place of articulation focusing on the airflow through the vocal tract and the organs responsible for articulating the sounds such as /P/ and /T/ in the English language. The same is implied for the Pashto letters /پ/ and /ت/. The Pashto "پ" is a bilabial while the sound "ت" is alveolar. The vowel sounds on the other hand as described by the same research are pronounced through height, tenseness, and backness of tongue position in the mouth. Vowel sounds are universal sounds almost common to all the languages across the map. In English, there are 20 vowel sounds including short vowel sounds, long vowel sounds, and diphthongs. Pashto on the other hand is an Indo-Iranian language. The overall sounds of the Pashto language are divided into three categories: Khpalwak Ghagona (Vowels), Bewaak Ghagona (consonants), and Ghbarg Ghagona (Diphthongs). Furthermore, there are seven vowel sounds in the Pashto language (Rahman, 2011; 2009). The following table shows the comparison of Pashto and English vowel sounds:

Table 1: Vowel sounds in English and Pashto

SN	English Vowel Sound	Pashto Vowel Sound	Phonetic Transcription
1	/i:/ as in "sheep"	/a/ (ا) (as in منږه [maŋra] - "apple")	məŋrə
2	/ɪ/ as in "ship"	/ə/ (ه) (as in تره [Tra] "uncle")	/tra:/
3	/e/ as in "bed" (British English)	/a:/ - (ا) (as in لاس [Laas] - "Hand")	/la:s/
4	/æ/ as in "cat"	/e/ (ې) (as in کې [ke] - "in")	/keɪ/

5	/ɑ:/ as in "father" (British English)	/i/ - (ي) (as in بريد [brid] - "border")	/brɪd/
6	/ɒ/ as in "hot" (British English)	/o/ - (و) (as in بناړو [Kharo] - "Myna")	/kha:rou/
8	/ɔ:/ as in "thought" (British English)	/ʊ/ - (ؤ) (as in توت [thoth] - "Morus")	/toʊt/
9	/ʌ/ as in "cup"		/kʌp/
10	/u:/ as in "goose"		/gu:s/
11	/ʊ/ as in "foot"		/fʊt/
12	/eɪ/ as in "face"		/feɪs/

The dialects of the Pashto language are divided into two major categories of Northern and Southern dialects, for example, Yusufzai dialect (or Northeastern dialect), Central Ghilji dialect (or Northwestern dialect), Abdali dialect (or Southwestern dialect), and Kakar dialect (or Southeastern dialect). There are also plenty of sub-dialects in the Pashto language such as the southern variety is further categorized as the Shirani dialect, Marwat-Bettani dialect, Southern Karlani group, Khattak dialect, Banoswala dialect, Dawarwala dialect, Masidwala dialect, and Wazirwala dialect. The northern dialects are further divided into Taniwola dialect, Khosti dialect, Zadran dialect, Mangal dialect, Afridi dialect, Khogyani dialect, and Wardak dialect.

The Pashto language has dialectal and accentual differentiation based on the variation in the consonant and vowel sounds. For example, there is a difference in pronouncing "خ" 'Kha' sound between the speakers of the Yousafzai dialect (pronouncing "خ" as "خ" while the people from the Bannu pronounce /خ/ sound as /ش/). Similarly, in the current study, the researchers are looking at the difference between the local Yousafzai dialect and the Thanawal accent of the Pashto language and what are the rules regulating the difference in the Thanawal accent.

Thana is a historic town located in the Malakand district of Khyber Pakhtunkhwa, Pakistan. Situated in a picturesque valley, Thana is surrounded by majestic mountains and lush green forests, making it a breathtakingly beautiful destination. With a rich cultural heritage, Thana has been a hub of knowledge and learning for the last five decades, boasting a high literacy rate and renowned educational institutions. Its strategic location has made it an important center of trade

and commerce, connecting the region to major cities like Mingora and Peshawar. Thana's unique blend of natural beauty, intellectual pursuits, and cultural significance makes it a fascinating place to explore.

Methodology

This study is a corpus-based analysis of the Thanawal spoken discourse. Corpus is defined as the collection of any form (spoken or written) of human discourse and saved on a computer for further analysis through software to see the pattern of a language under study (Baker, 2008; Hassan, 2019, 2023; Hassan et al., 2024). Similarly, this corpus-based study has been designed to observe the phonetic variation in the Thanawal accent spoken by people in the town of Thana, district Malakand. For this purpose, the researchers have conducted a series of fieldwork activities such as focus groups to create the desired corpus comprising spoken discourse.

Corpus Design

Creating a corpus of spoken discourse is not always an easy task, however, the researchers of the current study have to frequently visit Thana town to find participants for the study and compel them to be part of their focus group. A group of 7 participants from Thana was selected and they were provided with a list of 500 common Pashto words including verbs, nouns, adjectives, and pronouns which they had to pronounce. The participants were selected through purposive sampling from different fields and areas of Thana just to ensure the variety and radius of variation. The participants' consents were taken verbally and after their agreement, the fieldwork activities were conducted. All the interviews were recorded in audio with the participants' consent. The collected corpus was saved on a computer in a specific folder for further analysis.

Corpus Analysis

The data was analyzed using the PRAAT software (Boersma, 2001). According to Boersma and Weenink (2007), the corpus of collected audio sounds was uploaded to the software, and then through the spectrogram feature of the software the Pitch and Intensity of each sound were derived carefully. According to another study by Boersma and Heuven (2001, p. 341) "PRAAT is most often used with speech sounds, in which case the pitch contour is associated with the vibration of the vocal folds and the formant contours are associated with resonances in the vocal

tract.” Similarly, in the current study, the PRAAT has also helped the researchers to see the intensity and pitch of words on the segmental level for the word sounds ending with /o/ /ə/ and /u/. This way of analyzing the sound pattern of the desired words also provides a scientific explanation and proof of variations in languages as shown in figures 1, 2, 3, and so on.

Results and Discussion

As shown in Table 2 below, there is a high difference between the pitch and intensity of the words pronounced by the people of the Yousafzai dialect and those who speak Thanewal Accent. It is also clear from the spectrogram retrieved from the software that when the people from the Yousafzai dialect pronounce the words shown in Tables 2, 3, 4, and 5 they pronounce them with /o/ /ə/, which is common among the whole Pashtun community. However, the people in Thana pronouncing these words use /u/ /o/ which is quite interesting as it is a rare phenomenon in nearby Pashtun society. The following table shows a list of words analyzed through the Prat software for any deviation of Pitch and Intensity:

Table 2: Pitch and intensity of the sounds analyzed through PRAAT

SN	Words	Transcription	Pitch HZ	Intensity HZ
1	Za/Zu /خ/	/zə./, /zʊ/	3059/2880	1828/2717
2	Ta/Tu /ت/	/tə./, /tʊ/ /ت/	3278/3101	1828/2279
3	Oba/Obu	/ɔ:bə/, /ɔ:bʊ/	3224/3005	1444/2663
4	Orra/Orru /ر/	/ɔ:rə/, /ɔ:rʊ/ /ر/	3251/2964	1787/2963
5	Trawa/Trawu /ت/	/tra:wə/, /tra:wʊ/ /ت/	3265/2964	1390/2307
6	Khwaga/Khwagu /خ/	/kwa:gə/, /kwa:gʊ/ /خ/	3155/2923	1718/2498
7	Oda/Odu	/ɔ:də/, /u:dʊ/	3320/3005	1828/2598
8	Kata/Katu /ت/	ka:tə/, /ka:tʊ/ /ت/	3210/3183	1650/1869
9	Kenasta/Kenastu /ت/	/kena:stə/, /kena:stʊ/	3320/3018	1677/1841
10	Gadedu/Gadedu /گ/	/gɑdɪ.də/, /gɑdɪ.dʊ/ /گ/	3251/2950	2238/2402

Case Study of Pronouns

Pashtuns use a list of pronouns such as 'خه' (I), 'ته' (You), 'هغه' (He), 'هغو' (They), 'هغې' (She), 'ماتا' (me), 'مونگ' (we), 'دا' (it) etc. The following table shows the list of pronouns in which the variation of vowel has been recorded:

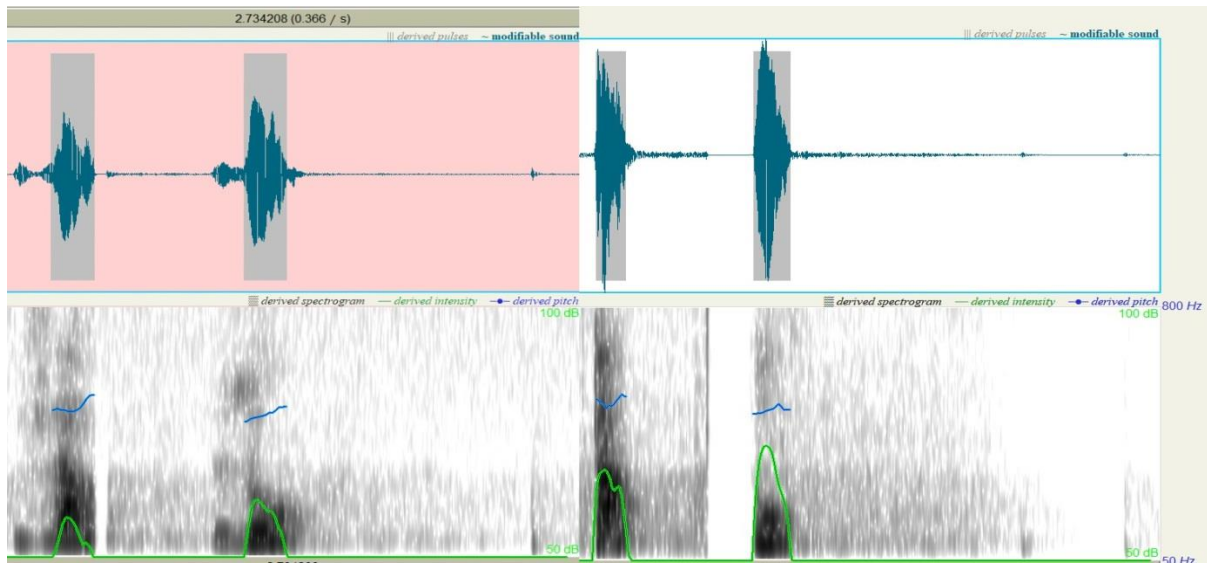
Table 3: List of modified pronouns

Phonetic Transcription	Pashto Pronouns Thana Dialect	Phonetic Transcription Yousafzai dialect	Pashto Pronouns of the Yousafzai dialect	SN
/tʊ/ /ت/	تو (و)	/tə/ /ت/	ته (ه)	1

/zʊ/ /خ/	خو(و)	/zə/ /خ/	خه(ه)	2
/hghʊ/ /غ/	هغو(و)	/hghə/ /غ/	هغه(ه)	3

When these sounds were studied under the PRAAT software the variation was confirmed with higher intensity and lower pitch. The Pashto vowel sound (ه) /ə/ when pronounced has a higher pitch and lower intensity in comparison to the Pashto vowel sound /ʊ/ /ʊ/ as shown in the figure below:

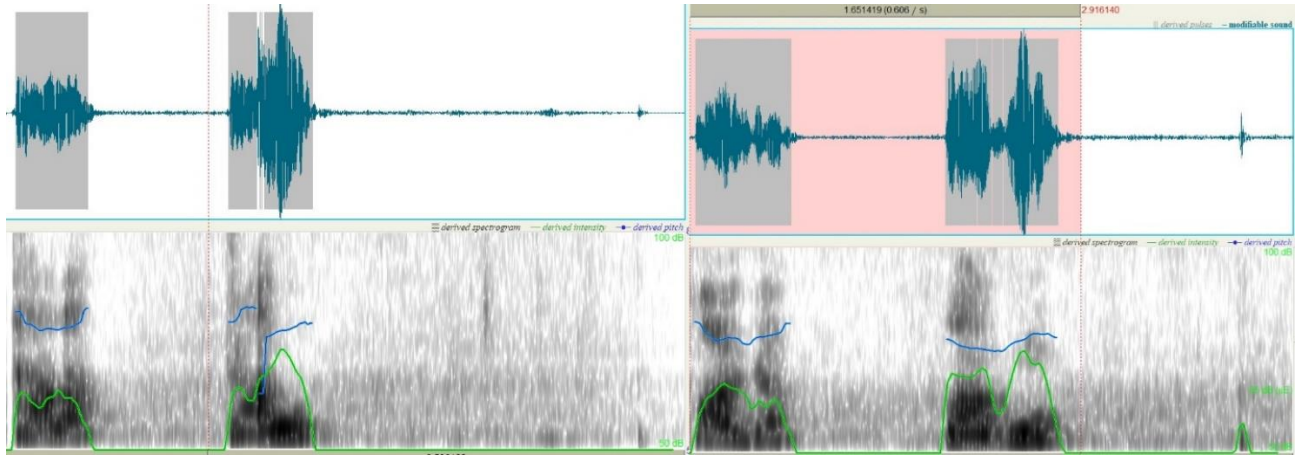
Figure 1: Spectrogram showing the Pitch and Intensity of Ta, Tu, Za, and Zu



Case study of adjectives

The analysis of the adjectives reveals that adjectives that finish with the /ə/ /ə/ sound are substituted with the /ʊ/ /ʊ/ sound. The adjectives ‘Khwaga’ /is pronounced as ‘Khwagu’ and ‘Trawa’ as ‘Trawu.’ A rise in the intensity can be seen when the words are pronounced with the /ʊ/ /ʊ/ sound as shown in the figure below:

Figure 2: Spectrogram showing the Pitch and Intensity of 'Khwaga', 'Khwagu', 'Trawa', and 'Trawu'



During the data analysis, it was also found that the participants pronounced most of the adjectives with the /ɔ/ /ʊ/ sound. A list of all the identified adjectives in the participants' conversations is given below in Table 4.

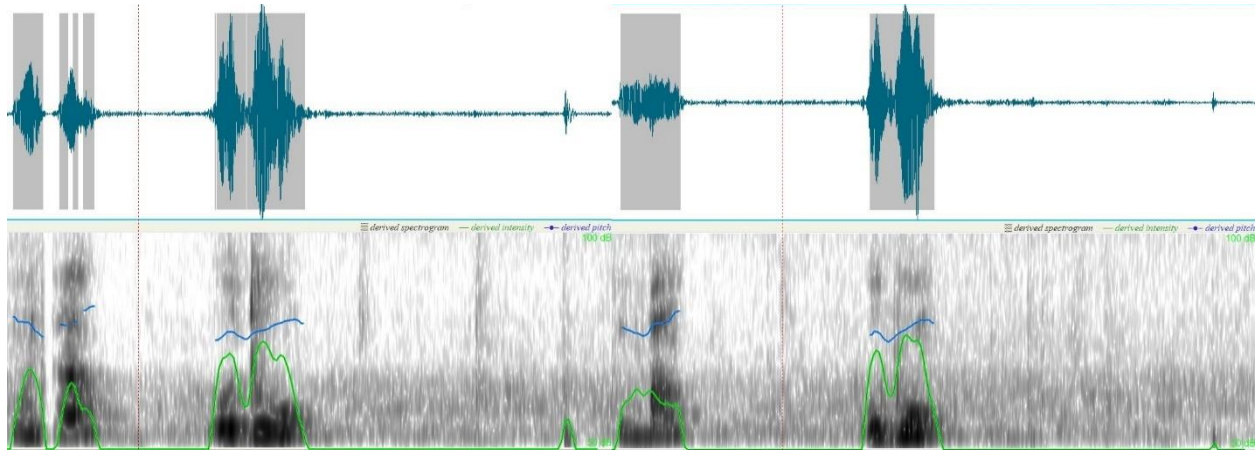
Phonetic Transcription	Pashto Adjectives Thana Accent	Phonetic Transcription	Pashto adjectives Yousafzai Accent	SN
/kwa:ɡʊ/ /ک/	بنواگو (و)	/kwa:ɡə/ /ک/ /خ/	بنواگه (ه)	1
/za:ɪʊ/ /ر/	زارو (و)	/za:ɪə/ /ر/	زاره (ه)	2
/ka:ɡʊ/ /ر/	کارو (و)	/ka:ɡə/ /ر/	کاره (ه)	3
/tra:wɔ:/ /ت/	تراوو (و)	/tra:wə/ /ت/	تراوه (ه)	4
/ta:rkʰʊ/ /ت/ /خ/	تارینو (و)	/ta:rkʰə/ /ت/ /خ/	تارینا (ه)	5
/sa:ɪʊ/ /ر/	سارو (و)	/sa:ɪə/ /ر/	ساره (ه)	6
/kʰaɪstʊ/ /ت/	بنایستو (و)	/kʰaɪstə/ /ت/	بنایسته (ه)	7

Table 4: List of modified adjectives

Case Study of Nouns

Two of the studied nouns are displayed in the figure below. Most of the nouns ending with /ə/ /ə/ in the other dialects of the Pashto language are pronounced with /ʊ/ /ʊ/ in the Thanawal accent. The following spectrogram shows the pitch and intensity for the words 'Oba' /ʊ/bə/ pronounced as 'Obo' /u: bu/ while the word 'Wada' /wadə/ is pronounced as Wado /wədu/ /ʊ/ /ʊ/. Both /b/ and /d/ sounds are plosive and voiced sounds which is why a high rise in the intensity of sounds can be seen in the figure below:

Figure 3: Spectrogram showing the Pitch and Intensity of 'Oba', 'Obo', 'Wada', and 'Wadu'



The researchers found that nouns finishing with /ə/ / ɐ/ sound are pronounced with /ʊ/ /ʊ/. Especially almost all the uncountable nouns from the list were pronounced with /ʊ/ such as ماستو 'Yogurt', 'اوبو' 'water', 'شودو' 'milk', 'وينتو' 'hair', 'واينو' 'grass', 'وارگو' a type of milk, etc. The nouns that are pronounced with /ʊ/ from the list given to the participants are listed in table 5 below:

Table 5: List of nouns pronounced in the normal Pashto accent and Thanewal accent with Phonetic Transcription

Phonetic Transcription	Pashto Nouns Thana accent	Phonetic Transcription	Pashto Nouns Yousafzai accent	SN
/tro/	ترو (و)	/trə/	تره (ه)	1
/ma:stʊ/ /ت/	ماستو (و)	/'ma:stə/ /ت/	ماسته (ه)	2
/ɔ:bʊ/	اوبو (و)	/ɔ:bə/	اوبه (ه)	3
/ʃəudʊ/	شودو (و)	/ʃəudə/	شوده (ه)	4
/zɪʊ/	زرو (و)	/zɪə/	زره (ه)	5
/wekhtʊ/ /ت/	وينتو (و)	/wekhtə/ /ت/	وينته (ه)	6
/ətʊ. / /ت/	اتو (و)	/ʌtə/ (ta)	اته (ه)	7
/nekʊ:/	نيكو (و)	/ nekə /	نيکه (ه)	8
/ka:rgʊ/ /غ/	کارغو (و)	/'ka:rgə/, /ghə/	کارغه (ه)	9

/wa:khɔ/ /ين/	وابنو (و)	/'wa:khə/, /ين/	وابنه (ه)	10
/wa:rgɔ/ /گ/	وارگو (و)	/war:gə/ /گ/	وارگه (ه)	11
/za: dɔ/	زادو (و)	/za:də/	زاده (ه)	12
/wa:ɪɔ/ /ر/	واړو (و)	/wa:ɪ ə/ /ر/	واړه (ه)	13
/srɔ/	سرو (و)	/sra:/	سره (ه)	14
/Wa: dɔ:/	وادو (و)	/wa:d ə/	واده (ه)	15
/ɔ:ɪɔ/ /ر/	اوره (و)	/ɔ:ɪə/ /ر/	اوره (ه)	16

However, the data analysis reveals that the rules of pronouncing /ə/ / ə/ as /ɪ/ / ɪ/ cannot be applied to every noun in the Pashto language. This is why this study is important: it clarifies the confusion about why some nouns are pronounced with /ɪ/ / ɪ/ and some are not in the Thanewal accent.

Case Study of Exceptional Nouns

This section overviews those nouns that have not been modified by the participants and are not affected by the rule under discussion. This study after a thorough analysis of the data defines the rule for such words and it was found that those nouns whose plurals end with (ي) /i:/ sound are not affected by the rule of /ə/ / ə/ to /ɪ/ / ɪ/. These words are pronounced the same as by the speakers of the Yousafzai dialect. Table 6 shows a list of words that are not affected by the rule of modification:

Table 3: List of Non-Modified Nouns

Phonetic transcription of plural form	Plural form	Phonetic transcription of exceptional nouns	Exceptional nouns	SN
/pɔzi/	پوڅي (ي)	/pɔzə/	پوڅه (ه)	1
/khəzi:/	خځي (ي)	/khəzə/	خځه (ه)	2
/stərgi:/	سترگي (ي)	/stərgə/	سترگه (ه)	3
/ɔgi./	اوگي (ي)	/ɔgə/	اوگه (ه)	4
/əɳdi:/	شونډي (ي)	/əɳdə/	شونډه (ه)	5
/pəkhi:/	پښي (ي)	/pəkə/	پښه (ه)	6
/ma:lti:/	مالتي (ي)	/ma:ltə/	مالته (ه)	7

Case Study of Verbs

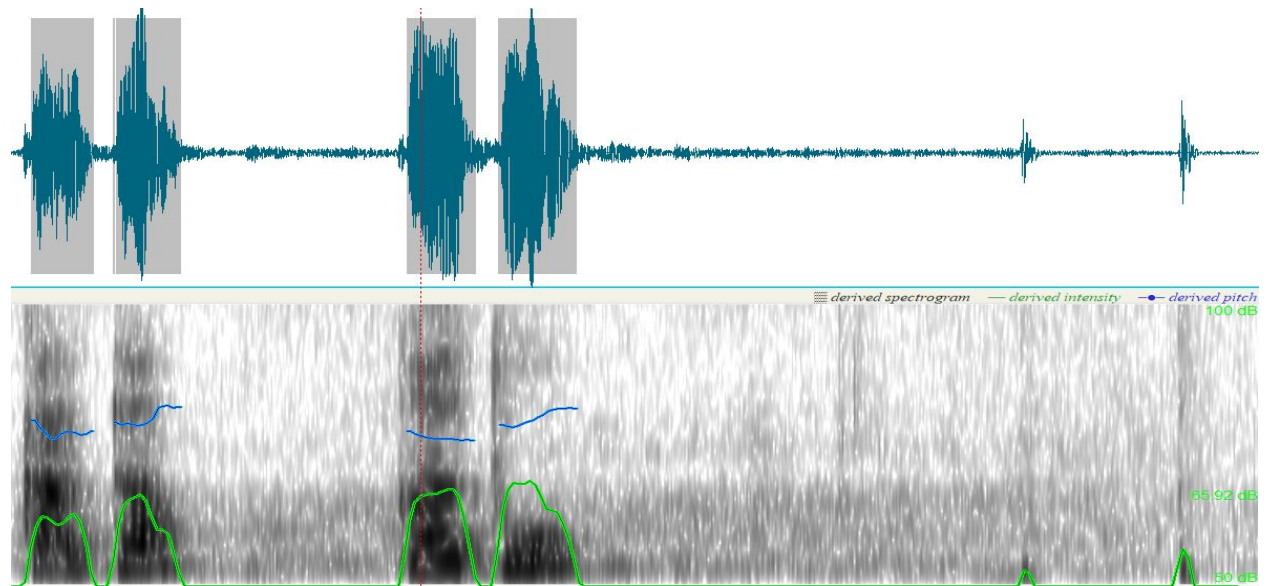
In this research study, the researchers have examined that some verbs of the Yousafzai dialect that end with the /s/ sound are modified with /o/ / ə/, /u/ /ʊ/ sounds in the Thana dialect of the Pashto language. As mentioned in the following table the words ‘اوبنوار، پاخه، کاته’ in the Yousafzai dialect have been changed to ‘اوبنوارو، پاخو، کاتو’ in the Thana dialect.

Table 7: List of Verbs modified in Thanewal Accent

Phonetic transcription of Thana accent	Pashto verbs of Thana accent	Phonetic transcription of Yousafzai dialect	Pashto verbs of the Yousafzai dialect	SN
/ka: tʊ/	کاتو (و)	/ka:tə/	کاته (ه)	1
/pa: khʊ/	پاخو (و)	/pa:kh.ə/	پاخه (ه)	2
/u: khwa: ʊʊ/	اوبنوارو (و)	/u:kh.wa: ʊə/	اوبنواره (ه)	3
/'kɛna:stʊ/	کیناستو (و)	/'kɛna:stə/	کیناسته (ه)	4
/'gɒdɪ.dʊ/	گډیدو (و)	/gɒdɪ.də/	گډیده (ه)	5
/waʊrɪdʊ/	واورېدو (و)	/waʊrɪdə/	واورېده (ه)	6
/u: dʊ/	اودو (و)	/'u:də/	اوده (ه)	7

The analysis of some of the verbs through PRAAT software reveals the difference in the pitch and intensity of the words pronounced in Thanewal and Yousafzai accents as shown in the figure (showing the pitch and intensity for the word Kata/seeing) below:

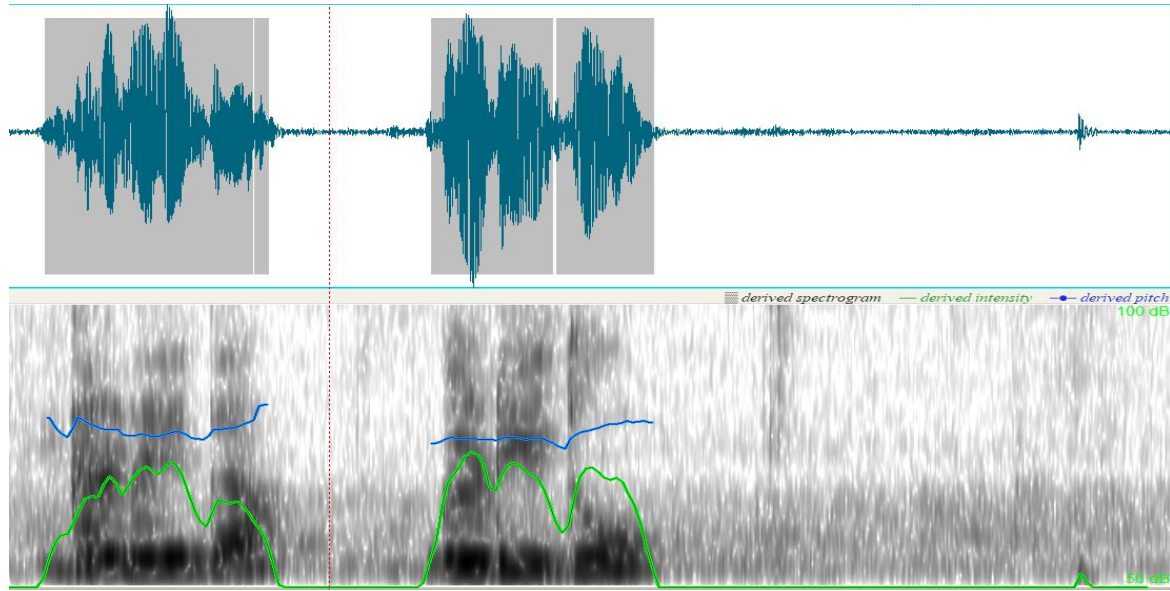
Figure 4: Spectrogram showing the Pitch and Intensity of ‘Kata’, ‘Katu’, ‘Gadeda’, and ‘Gadedu’



As shown in the figure above the derived pitch for the word ‘Kata’ is higher than the word ‘Kato’ however, the derived intensity for the word Kata is lower than the word ‘Kato’. This shows that the modified word ‘Kato’ needs higher intensity to be pronounced.

Similarly, the same has been identified for the words ‘Gadeda’ and ‘Gadedu’. In the figure 5 below it has been shown:

Figure 5: Spectrogram showing the Pitch and Intensity of Gadeda, and Gadedu



The figure shows that the derived pitch for the word Gadeda is higher than the word ‘Gadedo’ but the derived intensity for the word ‘Gadedo’ is higher than the word Gadeda.

Discussion

This study was designed to understand the phonetic variations in the Thanewal accent of the Yousafzai Dialect. The researcher for the purpose went through a fieldwork data collection process where they met and conducted focus group surveys where the participants were all originally from the Thana town of District Malakand, Khyber Pakhtunkhwa. The analysis of the data reveals some striking variations in pronouncing certain words. People in Thana pronounced mostly nouns and adjectives ending with /ə/ /o/ /u/ with /o/ /u/ sound, for example, /ə/ واده Wada/N/ to /o/ وادو Wadu/N and بنواگه ‘Khwaga’ /Adj. to بنواگو Khwagu/Adj. Similarly, the same rule /o/ rule has also been applied to some pronouns such as /ə/ ته Ta/pr. to /o/ تو Tu. Moreover, the same rule /o/ can also be seen interfering with some of the verbs ending with /ə/ such as /ə/ پاخه Pakha/V to /o/ پاخو Pakhu.

However, the rule /o/ does not affect all nouns, pronouns, verbs, and adjectives. Certain words are not pronounced in the same manner as the other affected are spoken. The researchers

identified the reason for this interesting phenomenon and after studying the morphological structure of all those words that are not pronounced as the other affected the researchers reached the conclusion that a word especially a noun ending with /ə/ but its plural ends with (ی) sound will never be affected by the /ɔ/ rule.

Conclusion

Based on the shreds of evidence provided by the analysis phase, this study concludes that people in Thana do phonetic variation when pronouncing certain nouns, verbs, pronouns, and adjectives ending with the sound /ə/ (ə) in the normal Yousafzai dialect with /ɔ/ /ʊ/, for example, 'Khwaga' as 'Khwagu', 'Za' as 'Zu', 'Khwarra' as 'Khwarru', and Wada as Wadu. The surveys also observed that there is no other area in the nearby districts where people do these variations except with pronouns only. The current study is leaving a gap for future research where researchers can work on creating a diglossia for this accent based on this current study.

Contribution of the Study

After an in-depth analysis of the corpus collected from the field survey, this study has come up with some interesting findings. It identified certain rules that describe when the people in Thana do variations of certain words. **R1:** Thanewal people change the sound of any noun word sound finishing with /ə/ /ə/ to /ɔ/ /ʊ/ unless the plural of any noun finishes with ی /i:/sound. Furthermore, it is evident from the analysis of the data that the plural of all the modified nouns did not end with ی sound. **R2:** Those nouns whose plurals end with ی sound are not changed or modified with the /ɔ/ /ʊ/ sound. **R3:** All the countable nouns are modified and pronounced with /ɔ/ /ʊ/. **R4:** Adjectives ending with /ə/ /ə/ will be pronounced with /ɔ/ /ʊ/. **R5:** similarly, pronouns ending with /ə/ /ə/ are pronounced with /ɔ/ /ʊ/. **R6:** In a similar way, verbs ending with /ə/ /ə/ sound are all pronounced with /ɔ/ /ʊ/ sound. **R6:** The study also identified through the PRAAT software that there is a high difference in the derived intensity of the modified sound /ɔ/ /ʊ/ in comparison to /ə/ /ə/.

References

- Baker, P. (2008). A Useful Methodological Synergy? Combining Critical Discourse Analysis and Corpus Linguistics to Examine Discourses of Refugees and Asylum Seekers in the UK Press. *Discourse and Society*, 19, 273-306.
<https://doi.org/10.1177/0957926508088962>
- Boersma, P. and Weenink, D. (2007) PRAAT: Doing Phonetics by Computer (Version 5.2.34)
<http://www.fon.hum.uva.nl/praat/>
- Boersma, P. and van Heuven, V. (2001) Praat, a System for Doing Phonetics by Computer. *GLOT International*, 5, 341-345. <https://www.fon.hum.uva.nl/paul/papers/speakUnspeak>

- Crystal, D. (2008). *A Dictionary of Linguistics and Phonetics* (6th ed.). Oxford: Blackwell.
<http://dx.doi.org/10.1002/9781444302776>
- Hassan S. (2022). The Behaviour of Public and Press towards Burqa: A Corpus-Assisted Discourse Analysis. *Corporum: Journal of Corpus Linguistics* 5(1), 24-39.
https://www.researchgate.net/publication/358857259_The_Behaviour_of_Public_and_Press_towards_Burqa_A_Corpus-Assisted_Discourse_Analysis
- Hassan, S. (2019). Populism and popularity in Imran Khan's 2018 election speeches. In R. Breeze and Ana M. Fernández Vallejo (eds.), *Politics and populism across modes and media* (pp.181-204). Peter Lang. Bern. Berlin. Bruxelles. New York. Oxford
- Hassan, S., Ali, S., Anjum, J., Bari, H., Bhatti, F. G., & Sayyed, M. (2024). Psychological Implications of Linguistics Choices Used to Portray Crimes in Print Media: A Corpus-Assisted Discourse Analysis of Crime Reports from Islamabad and Rawalpindi Published in The Dawn and The Express Tribune. *Migration Letters*, 21(S8), 1119–1132.
<https://migrationletters.com/index.php/ml/article/view/9543>
- Ladefoged, P., & Johnson, K. (2011). *A course in phonetics* (6th ed.). Boston, MA: Wadsworth
- Rahman, G. & Uddin, R. (2011). The acoustic analysis of Pashto vowels. *Language in India Strength for Today and Bright Hope for Tomorrow*, 11(11), 790-794.
https://www.researchgate.net/publication/305724995_The_Acoustic_Analysis_of_Pashto_Vowels
- Rahman, G. (2009). *A Comparative Study of Pashto and English Phonology for English Language Teaching and Learning*, MS Thesis, UMT, Lahore, Pakistan, Unpublished.
https://thesis.asianindexing.com/thesis.php?ari_id=1676712918491&title=Comparative%20Study%20of%20Pashto%20and%20English%20Phonology
- Wang, M. Li, C., & Lin, C. Y. (2015). The Contributions of Segmental and Suprasegmental Information in Reading Chinese Characters Aloud. *PLoS One*, 10(11).
<https://doi.org/10.1371/journal.pone.0142060>