Experimental Analysis of Uyghur Vowel Umlauting

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Abstract--In this paper mainly discusses important topics "vowel umlauting" in Modern Uyghur, firstly description and characterization of the phenomena, and through experimental analysis make a new conclusion.

Keywords — Uyghur; Vowel; Umlauting; raising ;low; vowels

I. INTRODUCTION

"Uyghur umlauting" as two different phonological processes, namely (i) the raising of the low vowels /a/ and /ä/ due to the regressive assimilation of the following high vowels in closed syllable and (ii) the reduction of low vowels mainly due to the shift of the primary accent. The former is actually part of a General Vowel Raisin process that signals the separation of Uyghur from other closely related old and modern Central Asian Turkic languages. Diachronically, the raising is earlier that reduction; the latter did not develop into an automatic phonological process until the 1950s. The raising umlaut affected the phoneme inventory of modern Uyghur, altering the distribution of some phonemes, while the reduction gave rise to considerable composite suffixes. This paper rejects the claims considering the "Uyghur umlauting" a result of the merge of *i* and *ï* in modern Uyghur, and argues that the major motivation for development of the "Uyghur umlauting" as a post lexical phonological process was not the Iranian influence on Uyghur. It considers "the Uyghur umlauting" as an inner-Uyghur development of two autonomous phonological processes, i.e. the raising and reduction that might also be expected in any other language of the Turkic family of languages.

The so-called "Uyghur umlauting" is often considered one of the most striking linguistic features of Modern Uyghur in contrast to other languages in the Turkic family languages. The phonological process in question has been discussed by various scholars since the second half of the nineteenth century; however, many important aspects of this phonological process still remain unexplored. First of all,as Johanson (1993a: 100) pointed out, most analyses are in fact based upon materials from the written language, and therefore the characteristics of the phonological process in question were not appropriately discussed in much of the linguistic literature. Secondly, systematic research on the historical development of the process in question is missing. Moreover we also know very little about its recent development in the spoken language. Thirdly, the effect of the "Uyghur umlauting" on the entire phonological system of the modern Uyghur language was never carefully investigated. Fourthly, concerning the triggers of the Uyghur umlauting, scholars suggest "Uyghur umlauting" fairly contradictory explanations: some of them consider it a result of internal phonemic merging, while others ascribe it to the influence of certain contact languages. Fifthly, most scholars believe that the phonological process in question originally was a feature of the northern dialects; however they do not explain how this phonological process was introduced to the written language and regional dialects. Finally, divergent attitudes in the treatment of the phenomenon in morpho syntactic analyses have raised a set of crucial problems, but none of them has yet been seriously taken into consideration.

II. DESCRIPTION AND CHARACTERIZATION OF THE PHENOMENA

The so-called "Uyghur umlauting" actually refers to the following two distinct phonological processes: Raising of low vowels /a/ and /ä/ due to the regressive assimilation of the following high vowels, as seen below in (1), and Reduction of the two low vowels mainly because of the shift of the primary accent—a few instances due also to the shift of the secondary accent—to the following syllables, as exemplified in (2).1

/baš/ 'head' + {(X)m} '1sg POSS' → /bešim/ 'my head'
/bar-/ 'to go' + {(X)p} 'CONV' → /berip/ 'going'
/ät/ 'meat' + {(s)I} '3sg POSS' → /eti/ 'his/her/its meat'
/käl-/ 'to come' + {(X)ŋ} '2sg PERS' → /keliŋ/ '(you) come'
/yazɣan/ 'having written' + {(X)mIz} '1pl POSSS →/yazɣinimiz/

/orda/ 'palace' + {(s)I} '3sg POSS' → /ordisi/ 'her/his palace'
/bala/ 'child' + {lAr} 'Pl' → /balilar/ 'children'
/ätä/ 'tomorrow' + {(s)I} '3sg POSS' → /ätisi/ 'next day'
/hämmä/ 'all' + {GA} 'DIR' → /hämmigä/ 'to everything'

Both phonological processes illustrated above were described by Radloff (1882: 63-65, 289) as "Rückwirkung des engen Vocales *i*" or "die palatalisierende Rückwirkung", having been considered a phenomenon that completely

corresponds to the German *Umlaut*. G. Raquette points out some facts that exhibit umlaut, but does not describe them with any specific term (Raquette 1912-1914: 126, 157). It was theeminent Swedish Turcologist Gunnar Jarring who systematically investigated the phonological process; he characterized it as "*i*-Umlaut" (Jarring 1933: 90-94). Since then most scholars use "umlaut" as a standard term to describe the phonological process in discussion; see Talipov 1987: 18-19, Hahn 1991: 51-52. Indeed, some Russian scholars prefer other terms; see Kajdarov 1969: 34; Sadvakasov 1988: 63-65. The Chinese and native Uyghur scholars basically describe the two processes using the terms 弱化 *ruohua* and *ajizlišiš*（weakening/reduction）, both denoting 'weakening, reduction'; see Zhao & Zhu 1985: 22-25, Yi 1985, Polat 1995 and ITL 22-23. What should be paid attention to is the term "Uyghur umlauting" suggested by Lars Johanson (1993a:100-101), which especially emphasizes the difference between the German umlauting and the "Uyghur umlauting". Yakup Abdurishid (Turkic Languages 2009 1)also carried out systematic research on important topics concerning the "Uyghur umlauting": its characteristics, historical development, effect and triggers, but experimental analysis on this topic has not been done yet.

III.   EXPERIMENT

A.   *Experimental Subjects*

This experiment choose two Uygur Students, including a male student and a female student whose mother languages are Uygur language, and speak standard Uygur Language.

B.   *Experimental Materials*

This experiment choose special two vowel umlauting Phoneme of Uygur , they are /a/ and /ä/.

C.   *Experimental Methods*

This experiment records in the Standard recording studio of Institute of information technology, North-West University for Nationalities. There are many hardware devices and audition1.5 recording software. Sampling rate: 16khz，accuracy:16, single channel audio.We analyze the recording materials through Praat speech software.

IV.   EXPERIMENTAL RESULTS AND ANALYSIS

In this part we mainly used praat software carrying out acoustic analysis on Uyhur umlauting, especially with praat can get 3-d spectrogram 、pitch、intensity、Formant and other acoustic feature, through this data further investigate into this phenomena in Modern Uyghur.
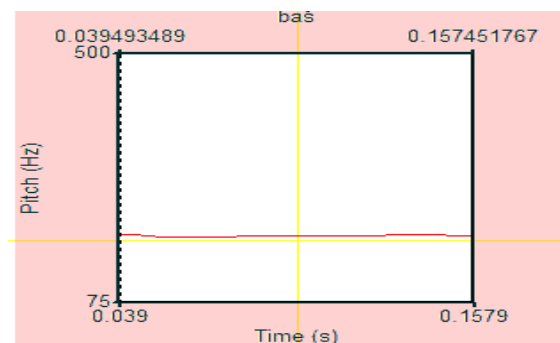
A.   *Pitch Features*

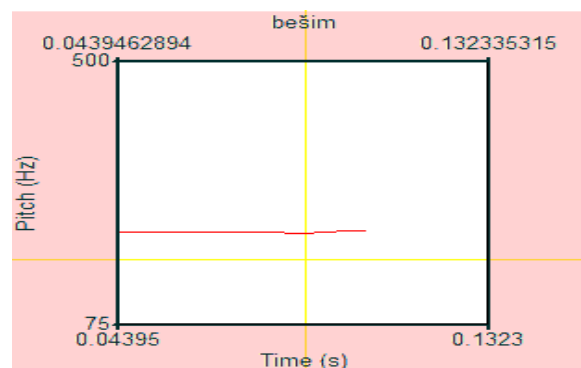

Figure 1.   /a / phoneme in 'Baš(Head)   pitch (HZ)

Figure 2.   /e / phoneme in bešim(My head)   pitch (HZ)
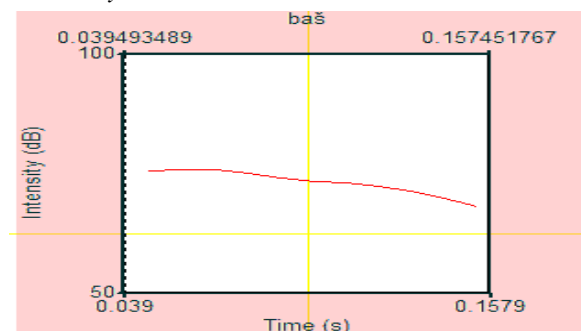
B.   *Intensity Features*

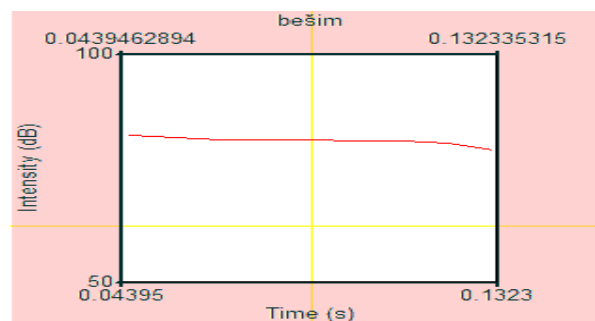Figure 3.   /a / phoneme in 'Baš(Head) Inttensiy (dB)

Figure 4.   Chart 4 /e / phoneme in bešim(My head) Inttensiy (dB)
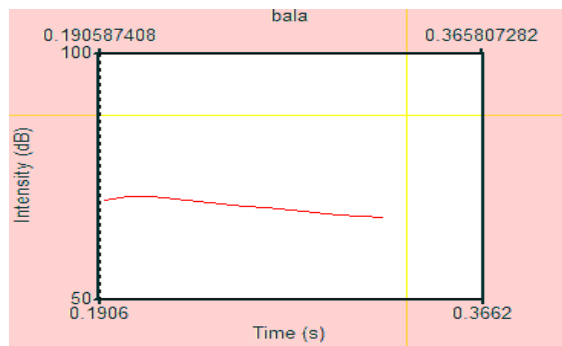
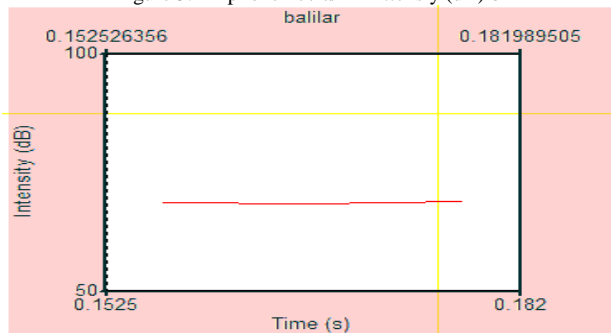Figure 5.   phoneme / a/ in Inttensiy (dB) b

Figure 6.   plural phoneme / a/ in bala Inttensiy (dB)
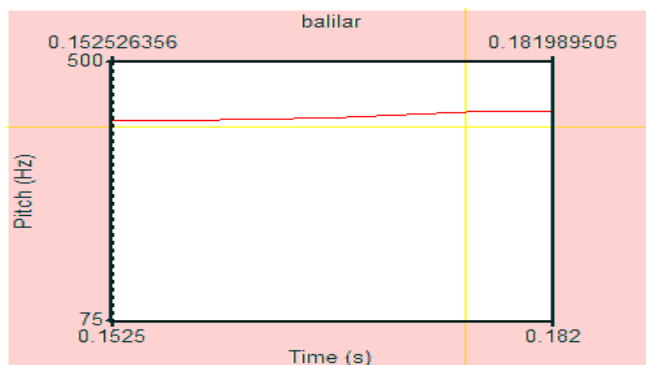

Figure 7.   Intensity of phoneme / a/ in balilar Inttensiy(dB)

V. ANALYSIS AND DISCUSSION

We can get Pitch、Intensity and Formants by acoustic analysis ,above 3-d spectrograms illustrated that one important topic 'Umlauting' in modern Uyghur , namely Chinese and native Uyghur scholars basically describe the two processes using the terms 弱化 *ruohua* and *ajizlišiš（weakening/*reduction）*is not correct*, actually the raising umlaut affected the phoneme inventory of modern Uyghur, altering the distribution of some phonemes, while the reduction gave rise to considerable composite suffixes. as Yakup Abdurishid mentioned (Turkic Languages 2009 1), Through acoustic analysis this paper also rejects the claims considering the "Uyghur umlauting" a result of the merge of $*i$ and $*ï$ in modern Uyghur, and argues that the major motivation for development of the "Uyghur umlauting" as a postlexical phonological process was not the Iranian

influence on Uyghur. It considers "the Uyghur umlauting" as an inner-Uyghur development of two autonomous phonological processes, i.e. the raising and reduction that might also be expected in any other language of the Turkic family of languages.

VI. CONCLUSION

As we have seen in acoustic Analysis , so-called "Uyghur umlauting" actually refers to two different phonological processes, namely (i) the raising of the low vowels /a/ and /a/ due to the regressive assimilation of the following high vowels in closed syllable and (ii) the reduction of low vowels mainly due to the shift of the primary accent—in a few instances due also to the shift of the secondary accent—to the following syllables in open syllabic words or units. Chinese and native Uyghur scholars the 'umlauting' this terms describe弱化*ruohua* and *ajizlišiš（weakening/reduction）is not proper actually* .it is not adequate to claim that the "Uyghur umlauting" (= "front-raising") results from the merge of *i and *i in modern Uyghur. First of all, both front i and back i still exist in modern Uyghur though they are different realizations of the same phoneme, and represented with the same letter. Secondly, the umlauting is also triggered when the closed mono-syllabic lexemes take suffixes with the initial back high vowel i. The major motivation for the development of the "Uyghur umlauting" as a postlexical phonological process was not the Iranian influence on Uyghur. The phonological process in question has taken place so recently that we have rather detailed data indicating its staging. It is an inner-Uyghur development of two autonomous phonological processes, i.e. the assimilation of low vowels to high vowels in closed syllables, and the reduction of low vowels in open unstressed syllables, which might also be expected in other Turkic languages. It was the special linguistic situation of the Ili valley around the eighteenth and nineteenth century that made the development of this phonological process possible.

REFERENCES

[1] Adamović, Milan 1993. Der uigurische Umlaut und seine Hintergründe. In: Laut, Jens Peter& Röhrborn, Klaus (eds.) 1993.

[2] *Sprach- und Kulturkontakte der türkischen Völker, Materialien der zweiten Deutschen Turkologen-Konferenz Rauischholzhausen*, 13.-16. Juli1990. Wiesbaden: Harrassowitz. 1-4.

[3] Comrie, Bernard 1997. Uyghur phonology. In: Kaye, Alan S. (ed.) 1997. *Phonologies of Asiaand Africa (including the Caucasus)*. Winona Lake, Ind.: Eisenbrauns. 913-925.

[4] Hahn, Reinhard F. 1986. Modern Uyghur language research in China:

Four contributions examined. *Central Asiatic Journal* 30, 35-54.

[5]   Hahn, Reinhard F. 1991. *Spoken Uyghur*. Seattle: University of Washington Press.

[6]   Hahn, Reinhard F. 1998. Uyghur. In: Johanson, Lars & Csató, Éva Á. (eds.) 1998. *The Turkic Languages*. London, New York: Routledge. 379-396.

[7]   Yakup Abdurishid (*Turkic Languages* 2009 1).