

Foreign Accent Syndrome: Neurolinguistic Description of a New Case

Abolfazl Akhlaghi¹, Nader Jahangiri², Mahmoud Reza Azarpazhooh³, Mahmoud Elyasi⁴, Maryam Ghale⁵

¹ Department of Linguistics, Ferdowsi University of Mashhad, Iran

² Department of Linguistics, Ferdowsi University of Mashhad, Iran

³ Neurology Center, Mashhad University of Medical Sciences, Iran

⁴ Department of Linguistics, Ferdowsi University of Mashhad, Iran

⁵ Department of Communication Disorders, Canterbury University, New Zealand

Abstract. Foreign accent syndrome (FAS) is a rare motor speech language disorder that causes a change in patient's accent making it sound foreign or, in rare cases, altered. In the present paper the language disorder of a rare case of regionally-like-altered accent has been studied and a neurolinguistic description has been presented. To reach this purpose the lesion region of the patient's brain was analyzed, and then a pre-stroke and post-stroke speech sample was compared phonetically and prosodically. Finally, based on the neurolinguistic findings and a judging panel, the nature of the post-stroke accent was analyzed. The patient is a native Farsi speaker. There was an appearance of the Yazdi accent in his speech after the stroke and following a right temporo-occipital ischemic lesion. Worthy of mention, this case study presents the first reported case of a FAS patient in the Middle East. Both phonetic-prosodic and perceptive analyses of the patient's speech samples showed that the new accent was not a complete Yazdi accent but a combination of both his native accent and Yazdi. The patient used the Yazdi-like accent as a compensatory strategy to obviate the problems caused by his limited access to his native accent verbal repertoire after the stroke.

Keywords: foreign accent syndrome, neurolinguistic description, altered accent, calcarine region, Yazdi accent

1. Introduction

Foreign accent syndrome (FAS) is a rare neurologically- or psychotically-based speech production disorder in which a patient produces the phonetic features of his or her mother tongue with an accent regarded as foreign by speakers of the same speech community. Although Pick [1] reported the first case of FAS, Monard-Krohn [2] authored the first systematic case of FAS, and finally, the phenomenon was first termed by Whitaker [3]. Since 1919, only a limited number of FAS cases have been reported by the researchers. The studies about this motor speech disorder contain information about demographic characteristics, neuroradiological findings, neuropsychological and neurolinguistic symptoms, evolution of symptoms, characteristics of the altered speech (inventory of all phonetic changes and characteristics). Verhoeven and Mariën have created a database of FAS cases (n=85) which is not published yet, and they hope to make it available next spring (2012).

Literature review presents a background and displays FAS as a disorder characterized by some degree of variation in symptomatology, etiology, and speech characteristics as indicated by some case studies. FAS symptoms are usually detected after an ischemic or hemorrhagic stroke, or as a consequence of traumatic brain injuries, primary progressive aphasia, or multiple sclerosis [4]. Some cases of FAS with psychogenic origin have also been reported in the literature. These cases had no brain damages but they suffered from psychiatric diseases such as depression [5], conversion disorder [6, 7, 8], bipolar disorder [9, 10] and Schizophrenia [10]. In most of neurogenic cases, it has been reported that FAS appeared after damage to the

¹ Corresponding author: Abolfazl Akhlaghi. Tel.: + (98) 09151641656; fax: + (98-511) 8794144
E-mail address: abolfazlakhlaghi@gmail.com

language dominant hemisphere of the brain (left hemisphere) [11, 12], and subcortical areas [13, 14]; however, a few cases have reported the lesion in the right hemisphere [15, 16] as well.

In the domain of linguistic investigations, phonetic and acoustic surveys of FAS revealed different characteristics of the patients' FAS speech. Phonetically, they showed a wide range of changes or errors from segmental to prosodic features. From the segmental point of view, some studies reported the reduction or simplification of consonant clusters [17, 18], consonant or vowel deletion [19, 5], consonantal changes of articulation [18], vowel changes of articulation [17, 12], and epenthesis or metathesis [3, 20]. In addition, vowel diphthongization was observed [21, 16]. From the prosodic point of view, case studies reported pitch changes [2, 18], intonation changes [22, 18], duration changes [16], stress changes [12], and lengthening [23]. Besides, slow speech was also observed [23, 18]. Although FAS is by definition excluded as a diagnosis when morphemes, grammatical adaptations, and semantics come in [8], two case studies reported the existence of words and expressions in the foreign accent in addition to the prosodic and phonetic changes [24, 25].

2. Case Report

The patient was a 40-year-old right-handed native speaker of Farsi whose accent was perceived as Yazdi¹ or Isfahani² following a prominent right temporo-occipital ischemic lesion affecting the calcarine region. Computerized tomographies (CT) scan of the brain revealed abnormality of the white matter as well (Fig. 1) (Unfortunately MRI was not performed because of a mechanical valve which was planted in his heart during a heart operation). It is worth mentioning that such a large stroke had a vascular cause. The patient had worked as a manager at a telecommunication company. His medical history is filled with several incidents which are exceptional among the reported cases of FAS patients. Kidney operations in 1988, heart operation in 1999, and tumor operation in 2003 were observed in his medical background. During 2009 to 2011 he lost his consciousness for three times with no realized reasons. At the beginning of 2011 he went into coma for 2 days because of a right hemisphere stroke. The patient woke with left sided hemiplegia and muteness. After regaining the ability to speak a Yazdi or Isfahani accent was distinguished by his family, friends, and investigators and later by the patient himself.

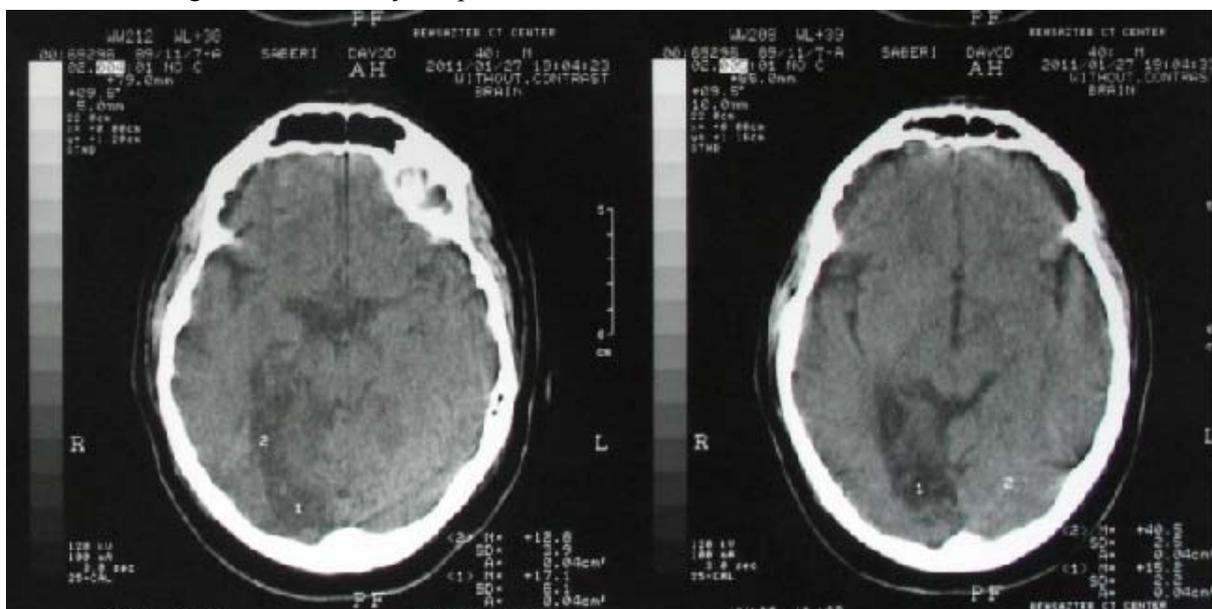


Fig. 1. Brain CT scan shows a right temporo-occipital ischemic lesion affecting the calcarine region. It seems that white matter is not OK as well. A vascular cause is the reason of such a large stroke.

Before the stroke, the patient had a standard Farsi accent and could speak Turkish, Arabic, English and Mashhadi dialect as well. After the stroke, he developed another accents of Farsi (Yazdi accent) spoken in

Yazd² or (Isfahani) spoken in Isfahan . It should be noted that these accents are noticeably different from standard Farsi accent. After the stroke, the patient could not speak with any previously learned dialect or language accent, but the prosodic features of his speech seemed to be similar to Yazdi or Isfahani speakers. The patient used all the criteria determined by Whitaker [3] to specify his accent as a neurogenic FAS. First, the patient's new accent was considered as foreign by his family, friends and the investigators. It is worth mentioning that some considered his accent as Yazdi and some considered it as Isfahani. Second, the accent was different from the patient's native accent, and third, the speech disorder of the patient was due to the damage of the focal neural system. Finally, although the FAS patient was indeed familiar with Yazdi, he only used this accent at rare occasions (e.g. when he visited his wife's relatives in Yazd).

3. Linguistics Description of the Patient's Speech

Sensory examination was done. The hearing sense was at a higher rate than its normal rate. Also some visuo-perceptual problems such as hemianopia and left visual neglect were observed, no evidence of apraxia or dysarthria was found. The patient's perception was normal. Four months after the stroke, a linguistic test based on Farsi aphasia test was taken from the patient under investigation. The results showed no aphasic symptoms in the patient's speech and no agrammatism, either. Both Boston naming test [26] and the token test [27] were carried out. A mild naming problem was found. For removing this problem, the patient used a descriptive strategy. For example when he was unable to name a few objects and pictures shown to him he described the features or definitions of that objects and pictures. The patient exhibited a mild word finding problem, labored speech, and repetition deficit; however, during the first few days after the stroke his speech was meaningless and unrelated. Reading was mildly abnormal because of the visuo-perceptual problems; moreover, the patient's writing was loose.

Four months after the stroke, the patient's speech was recorded and its characteristics were determined and studied. To have a more objective description, a pre-stroke and a post-stroke speech samples with the same duration (5 minutes) were prepared. The post-stroke speech sample was recorded during an informal conversation of the investigators with the patient. A judging panel was held. In the judging panel, 50 native Farsi speakers were participated and 65 percent voted that the patient accent is similar to Yazdi and 35 percent of the participants voted the accent was Isfahani. The fact that people almost did not agree about a specific dialect (Yazdi or Isfahani accent) is again a strong argument for FAS. Perceptual experiments of FAS patients lead as a rule to a variety of different accents. Atypicality of the accent is the reason why some researchers consider accents within FAS as a generic one.

The assessment of his post-speech and its comparison with the pre-stroke speech sample demonstrated that FAS accent was fluent, containing no syntactic mistakes. The semantic and pragmatic aspects of the patient's accent showed no changes. He could use all prepositions, derivational and inflectional morphemes correctly, but some Yazid words and expressions were observed. These characteristics made the patient exceptional, because most of the FAS case studies never reported the appearance of words or expressions in the altered accent. Moreover, the prosodic features of the pre-stroke accent have been investigated. A perceptive analysis was done by one of the authors. The results showed that his speech tempo and intensity were normal and he made no improper pauses between or within phrases and clauses. What made his accent sound altered were primarily his speech intonation and the stress patterns. Timing and pitch of his speech had changed after the stroke too. His post-stroke speech sample exhibited an additional lengthening and stressing of word initial syllables and was very similar to the accent spoken in Yazdi. Elongation of vowel /I/ was seen, as well.

Vowel and consonant articulatory analysis revealed both consonant and vowel changes (especially for vowels). In the domain of vowels, the changes of /e/ to /a/: /nemitunam/ (I can't) to /namitunam/, /i/ to /e/: /mixâm/ (I want) to /mexem/, /â/ to /e/: /mixâm/ to /mexem/, /a/ to /â/: /arus/ (bride) to /ârus/, /o/ to /u/: /mohkam/ (tight) to /muhkam/, /o/ to /e/: /boro/ (you go) to /bero/ were observed. A more limited number of consonant changes were seen in comparison with vowel changes. For example /y/ was changed into /g/:

² Yazdi is a dialect spoken in Yazd, a city located in central part of Iran. ² Isfahani is a dialect spoken in Isfahan, a city located in central part of Iran.

/dIge/ (other) and /dIye/, /d/ was changed into /y/: /pedar/ and /pIyar/. A careful attention to the consonant changes would show that although a consonant shift has happened, these changes can be regarded as diphthongization too. Consonant deletion: /man/ versus /ma/ and consonant and vowel changes of articulation (for example velarization of palatal /k/, and fronting of middle /e/) were also seen. Furthermore, no reduction or simplifications of consonant clusters were found.

4. Discussion

FAS is a language disorder which causes some changes in patient's accent making it sound foreign or, in very rare cases, altered. Most FAS cases reported so far have been due to a stroke involving lesions in different cortical and subcortical areas of the language dominant hemisphere (mainly left hemisphere). This syndrome has been reported in cases with different ages and different native languages. What make this case report important are three characteristics: the altered accent, the brain lesion region, and reporting the first case of FAS in the Middle East. The native language of most reported cases was American English.

Our case had a change of accent due to a right temporo-occipital ischemic lesion affecting the calcarine region. The patient's change of accent was mainly due to the alternation of his speech intonation. Although his accent did not seem to be impaired or foreign, it was considered by the listeners to be another accent of Farsi spoken in another region of Iran (Yazdi or Isfahani accent). The linguistic description of the patient's accent justified the investigators to relate the linguistic characteristics (especially prosodic ones) of the altered accent to Yazdi and not to Isfahani. Altered intonation, stress patterns, vowel and consonants changes, presence of a very few Yazdi expressions and words, diphthongization, and syllable lengthening are the characteristics similar to Yazdi but not to Isfahani accent. In the other reported case of regionally-changed accent [24], the patient had fluent aphasia and his accent change was mainly due to the change of prosody.

The investigated patient was not able to use his pre-stroke accent and even languages. After the stroke he only had the ability to speak with an accent similar to Yazdi. According to the native speakers of the Yazdi accent, the patient accent was not a complete Yazdi but a combination of both Yazdi and standard Farsi. Therefore, it is suggested that in this patient, the cerebral lesion had caused him to have a limited access to his native accent verbal repertoire, and, as a compensatory process his unconscious knowledge of Yazdi accent was activated.

The brain lesion region in this patient makes this case study an exceptional one. Literature review testified that no reported case of neurogenic FAS had showed accent changing following a lesion in calcarine region. According to Verheoven et al [8], FAS originates in focal brain damage in the precentral gyrus of the language hemisphere. In this case, the damage caused right temporo-occipital ischemic lesion affecting the calcarine region which is far from the language centers of the brain. This finding can challenge some the neurologic findings relating to FAS.

5. Conclusion

The aim of this paper has been to report the neurolinguistic description of a Farsi-speaking man suffering from FAS. This patient's accent had change into another accent of Farsi following a right temporo-occipital ischemic lesion. It was concluded that the patient's change of accent was mainly due to the alteration of his speech intonation and prosody. To the best of our knowledge, only one similar case of regionally-altered accent had previously been reported; therefore, it is suggested that change of dialect after damage to the central neural system must be considered as a variant of FAS which is a very rare phenomenon. Both Segmental-prosodic and judging panel analyses demonstrated the patient's accent is not a complete Yazdi accent but a combination of both Yazdi and his previous dominant accent (standard Farsi). It is suggested that in this patient, the cerebral lesion had caused him to have a limited access to his native accent verbal repertoire, and as a compensatory process his unconscious knowledge of Yazdi accent was activated.

6. References

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