PhD Proposal: Voice Onset Time in Jizan Arabic Dialect

The aim of this research is to study Voice Onset Time in the Jizan dialect of Saudi Arabic. The study will investigate the impact of level of education and gender on Voice Onset Time in Jizan Arabic with focus on aspiration and pre-voicing as the distinctive features that specify the voicing contrast in Jizan. Voice Onset Time (VOT) discovered by Lisker and Abramson (1964) and was defined as the period of time between the burst of a stop sound and the onset of periodicity that reflects the vibration of the laryngeal. The researchers identified three conditions for stop sounds: lead voicing, short-lag and long-lag. The first condition is voicing lead where the VOT has a negative value which means the voicing starts before the initial burst of the stop. The second condition is short lag where the voicing starts with the burst of the plosive or immediately after it. The short lag range is from zero to 25ms. The third condition is long lag where the stop is aspirated, and ranges from 60 to 100ms.

According to cross-linguistic studies, the effects of gender and age on VOTs seem to produce various outcomes depending on the language. In regard to gender, the majority of research on the articulation of English has shown that women produce significantly longer VOTs than men for voiced and voiceless plosives due to physiological differences between men and women (Swartz,1992). In addition, women produced longer VOTs for the voiceless plosives but shorter VOTs for the voiced plosives in English which can be caused by stylistic speech differences between men and women (Whiteside & Irving, 1998). However, in other languages, such as Korean (Oh, 2011) and Telugu (Madhu et al., 2014), women did not produce longer VOTs than men. Instead, men produced longer VOTs in Korean (Oh, 2011).

On the other hand, several studies have examined the effect of gender on VOTs in several Arabic dialects such as Jordanian Arabic (Abudalbuh, 2010; Khattab, Al-Tamimi, & Heselwood, 2006), Syrian Arabic (Almbark, 2008), and colloquial Egyptian Arabic (Rifaat, 2003). However, to date, no study has been conducted to determine the impact of gender on the Voice Onsite Time in the Arabic Jizan dialect with focus on aspiration and pre-voicing as the distinctive features that specify the voicing contrast in Jizan. Furthermore, there are several cultural constraints preventing such studies. One of the constraints is that in Saudi Arabia male researchers cannot obtain relevant data from female participants due to social and cultural norms. However, as this researcher is female, there will be no such barrier to data collection. The aims of this study are: (1) to identify the normative Voice Onset Times in the Jizan dialect, and (2) to investigate the impact of gender and level of education on Voice Onset Time in the Jizan dialect with focus on aspiration and pre-voicing as the distinctive features that specify the voicing contrast in Jizan dialect.

**The Jazan Region**

Jazan is one of the administrative provinces of the Kingdom of Saudi Arabia (KSA), located in the southwest of the Kingdom. It is bordered by the Asir region in the north and east, and the Red Sea on the west with a long coastline of about 330 km; the Republic of Yemen is to the south and southeast. The region includes a number of governorates that include several administrative centres distributed throughout its two divisions: the eastern highlands and the western coast.

Several local dialects are used in a number of southwestern regions of the Kingdom of Saudi Arabia: Al-Baha, Asir, Jazan, and Najran. The dialect used by people in the southern regions is closely related to the ancient Himyaritic Arabic dialect.



Figure 1. Map showing location of Jizan, Saudi Arabia (Image Credit: Saudi Aramco)

**Research Questions**

1. **What are the normative Voice Onset Times in Jizan dialect?**
2. **How do gender and level of education affect the voice onsite time in Jizan dialect?**

**Methodology**

**Study Design**

This study is an experimental study, which employs analysis of speech recordings and speech perception to determine the acoustic properties and perceptual thresholds of Jazani Arabic stops by Jazani speakers.

**Population and Sampling**

Using random sampling method, the participants recruited for this study will be 90 native speakers of Jazani Saudi dialect. They are students from different faculties of Jazan University. They are 45 males and 45 females with ages ranging between 20 and 25 and a mean of 23 years old. All the participants are required to be born, raised, and educated in Jazan.

**Instruments and Materials**

Three different experiments will be used in this study, namely demographic questionnaire, production task, and perception task. The same participants will perform the three experiments.

**Demographic questionnaire**

The participants will be asked to fill up the demographic questionnaire. It includes information relating to their gender, age, level of education, faculty, languages they speak, and place of residence.

**Production Task**

The goal of this task is to examine if there are differences between Jazani speakers in the VOT of stops. The speech production task is the first task used to conduct this research. The task requires pronouncing and recording disyllabic words containing the target sounds (Jazani Arabic stops). The target stops used in this study are /d/, /d?/, /t/, /t?/ /k/ /q/, and /b/. The recording will be carried out using the PRAAT software downloaded in the computer and connected with microphone headset.

**Procedure of production task**

The participants will be recorded individually in a quiet room at Jazan Unversity. They will be seated in front of the researcher’s computer. They will be given a list of Arabic words to go through and then recoded using PRAAT. Prior the task, they will be given a practice session before the actual task. The VOT measurements of the stops will be used as recommended by Lisker and Abramson (1964) and Lisker (1957), which is on the wideband spectrogram.

**Stimuli used in the production task**

The stimuli used in this study will be Arabic disyllabic words containing stops in the initial position as it was reported in previous studies that VOT of stops in initial position is easier and more accurate. The participants will be asked to read in Jazani dialect not in Standard Arabic. Stimuli were recorded using a microphone and PRAAT computer software. Each stimulus from is accompanied by a carrier phrase (قل ... مرة ثانية Say…again). The use of carrier phrase helped to determine the VOT of the target sound and the voicing of the vowel preceding consonants vibration. Without using the carrier phrase, important acoustic cues of the initial sound might be left out.

They will read the whole carrier sentence in order for the target words to be pronounced clearly and in the normal speech speed, as well as to be easily identified in the analysis. The stimuli used in the production task in present in Table 1.

**Table 1 Stimuli of the production task**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Stops | IPA symbol | Arabic Carrier sentence | Transcription | Gloss |
| د | /d/ | قول "دخل" مرة ثانية | Qol “dakla ” marra thanyah. | Say “came in” again. |
| ض | /d?/ | قول "ضحك" مرة ثانية | Qol “d?aħak” marra thanyah. | Say “laughed” again. |
| ت | /t/ | قول "تمر" مرة ثانية | Qol “tamr” marra thanyah. | Say “date” again. |
| ط | /t?/ | قول "طلب" مرة ثانية | Qol “t?alab” marra thanyah. | Say “requested” again. |
| ك | /k/ | قول "كسر" مرة ثانية | Qol “kasara” marra thanyah. | Say “broke” again. |
| ق | /q/ | قول "قمر" مرة ثانية | Qol “qamar” marra thanyah. | Say “moon” again. |
| ب | /b/ | قول "برد" مرة ثانية | Qol “bard” marra thanyah. | Say “cold” again. |

Each participant will read each sentence three times and the best production of the sentences that is clear and free of noise will be used in the analysis. Hence, there will be 7 sentences x 3 repetitions x 90 participants =1890 tokens.

**Perception Task**

The goal of this task is to examine if there are differences between Jazani speakers in the perception of stops. In this task, there will be audio recordings of Arabic stops. The stimuli will be Arabic words that differ in the phonological element and have a different meaning (minimal pairs). The stops will be at the initial position of each pair of the word. The stimuli will be recorded by one male and one female Jazani speakers in order to ensure the accurate pronunciation of the stops in Jazani.

The perception task employed in this study is a discrimination task. Discrimination is “the act of differentiating two or more stimuli which presented in some predefined format” (Logan & Pruitt, 1995, p. 22). Discrimination task can be divided into three distinct categories. They are category change task, ABX tasks, and finally AX discrimination task (same-different task). This study will use AX discrimination task (as shown in Figure 1).



**Figure 1 screenshot of the AX discrimination task**

**Procedure of the perception task**

The participants will sit comfortably in front of laptop, wearing a microphone headset. They will listen to two different words through their headphone sets at a time. They will be presented with different words consisting of the target sounds and will be asked to identify the consonantal phoneme they heard from the series of tokens generated. Two pairs of words were played at a time, then the participants judged by clicking on the relevant sound whether they are the *same* or *different*. As soon as the participants make their choices, the next words will be produced. The task will take about 10 to 15 minutes for each participant to complete, depending on the participant’s response pace. the correct response will be given (1) mark while the false response will be given (0). The scores of the participants will be calculated automatically by R.

**Stimuli in the Perception Task**

As mentioned earlier, the stimuli used in this task will be minimal pairs containing one of the Arabic stop in the initial position. The minimal pairs will include /d?/ -/d/, /t?/-/t/, /q/ -/k/, while /b/ will be excluded as there is no a counterpart of this stop. The stimuli are presented in table 2 below (as an example, not the complete list of the minimal pairs).

**Table 2 Stimuli of the AX task**

|  |  |  |  |
| --- | --- | --- | --- |
| Stops | IPA symbol | Minimal pairs | Gloss |
| د ض- | /d?/ -/d/ | ضار- دار | Dangerous- room |
| ت- ط | /t?/-/t/ | تين -طين | Fig- clay |
| ك- ق | /q/ -/k/ | كاد - قاد | Almost-directed |

The participants will listen to many minimal pairs produced two Jazani speakers (a male and a female). There will be more than 100 different sequences of the minimal pairs.

**Data Analysis Method**

I will use a combination of descriptive and inferential methods to analyze the data from the production and perception experiments. The precise methods to be employed will be confirmed once data has been collected. For example, VOT measurements may require normalization before they can be analyzed using mixed-effects regression modeling in R. Alternative methods may also be required for analyzing correct/incorrect responses in the perception experiments. I may also take the opportunity to analyze Reaction Times (RTs) to gain additional insights into the perception of voicing/aspiration contrasts in the dialect.

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