ASPECTS OF JAZANI ARABIC

By

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ABSTRACT

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The dissertation investigates two phonological features that are socially salient in Jazani Arabic: Word-initial consonant sequences (Hamdi, 2015), and /r/ (Ruthan, 2017). It addresses three main questions: (i) What is the syllabic organization of word-initial consonant sequences, i.e. are they simplex or complex onsets? (ii) What are the salient socio-phonetic features in Jazani Arabic? (iii) What are Saudis' attitudes toward Jazani Arabic? The dissertation provides novel descriptions and analyses of the two features, examining the social meanings associated with them, thereby expanding on current theories and approaches like syllable structure theory (Fudge, 1969; Kahn, 1976), the temporal coordination approach in phonology (Browman & Goldstein, 1988), and folk linguistics and attitudes research in sociolinguistics (Labov, 1966; Preston, 1986).

Unlike Classical Arabic and Modern Standard Arabic, Jazani Arabic allows word-initial consonant sequences. Their status as simplex or complex onsets has not been previously determined. The dissertation teases apart these two possibilities. 14 native Jazani speakers were recorded producing target words in two experiments. I measured the midpoint of the leftmost consonant to the end of the vowel (*left* edge), the midpoint of the rightmost consonant to the end of the vowel (*right* edge), and midpoint of the consonant sequences to the end of the vowel (*c-center*). In both experiments, the results show the *right edge* to anchor interval (end of the vowel) to have more stability in Jazani Arabic, indicating that Jazani Arabic has a simplex onset organization for word-initial consonant sequences. That is, the consonants in a word-initial consonant sequence are not all in the same onset but rather are parsed as C.CVX; e.g., [smaʕ]

"listen" is parsed as [s.maʕ]. This is a novel contribution to the literature on Arabic syllables and in line of a growing body of research in phonology. It also supports the effectiveness of acoustic methods of examining temporal interval durations to understand syllabic organization.

Jazani Arabic is socially stigmatized among speakers of other Saudi regional dialects, and, like other southern Saudi dialects, is judged as "bad," "unbearable," and "it sounds like Yemeni Arabic" (Alrumaih, 2002). Yet whereas word-initial sequences clearly set Jazani Arabic apart from other Saudi varieties, the other socio-phonetic features of Jazani Arabic that make it socially distinctive have not been identified. Qualitative responses to recordings of three Jazani speakers by 183 native Saudis shows that variably non-emphatic /r/ was identified as a salient feature of Jazani Arabic, and it merits future research.

Respondents also rated the speakers on a 6-point Likert scale for characteristics like *slow-fast*, *educated-uneducated.* Najdis (speakers of the central region dialect of Saudi Arabia) held more negative attitudes to Jazani speakers than respondents from other dialect areas on the *educated*, *smart*, and *friendly* scales. Such negative attitudes by Najdis toward Jazani Arabic speakers reflects the social stratification in Saudi Arabia. The results also show that older respondents perceived Jazani speakers to have fast speech slightly more often than younger respondents did. Qualitative data confirm beliefs, stereotypical views, and social status representations of Jazani speakers, such as "sounds like Yemeni," and low-income jobs such as "security guard," and "handcrafter." The dissertation is the first of its kind to document and reveal Saudis' beliefs and attitudes toward Jazani Arabic. The significance of the dissertation relies in presenting and analyzing new data of Jazani Arabic, shedding light on an understudied dialect of Saudi Arabic, which lends itself into phonology and sociolinguistics with its unexplored features.

To my great parents,
my lovely wife,
and my precious daughter

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CHAPTER 1. INTRODUCTION

1.1 Introduction

Arabic is spoken by 200-300 million people across North Africa and the Middle East (Albirini, 2016; Bale, 2010), with many varieties spoken in different countries and regions (Theodoropoulou & Tyler, 2014). Previous dialectology research has compared Classical Arabic, the language of the Holy Quran and old Arabic literature, Modern Standard Arabic (MSA), a combination of a modernized version of Classical Arabic with modern Arabic varieties, and colloquial dialects, informal Arabic dialects that do not have official status (Albirini, 2016; Versteegh, 2013). Although dialectological description of Arabic has encompassed all levels of the grammar, this dissertation will be principally concerned with the literature on Arabic phonology, sociolinguistics and sociophonetics. Some dialects have been more extensively researched than others, such as Moroccan Arabic (Boudlal, 2001; Chakrani, 2013), Jordanian Arabic (Al-masri & Jongman, 2004; Khattab et al., 2006), Baghdadi Arabic (Abu-Haidar, 1989; Youssef, 2013), and Egyptian Arabic (Broselow, 1976; Watson, 2002). The focus of this dissertation is the Arabic spoken in Saudi Arabia. Within Saudi Arabic (SA), Najdi Arabic (Al-Rojaie, 2013; Ingham, 1994) and Hijazi Arabic (Abu-Mansour, 1987; Al-Mozainy, 1981) are the most well-researched varieties. In contrast, southern Saudi dialects have received less attention, such as those of Rijal Alma (Asiri, 2009) and Abha (Al-Azraqi, 1998). A few studies (e.g., Hamdi, 2015; Himli, 2014; Shamakhi, 2016) have looked at folk-tales, syntax, and only descriptive phonological aspects of Jazani Arabic (JA), yet no previous study has investigated this dialect through phonological, phonetic, and sociolinguistic descriptions and analyses, a gap the present study has sought to address.

1.2 Jazan and Jazani Arabic

JA is a subregional dialect of southwestern SA spoken in and around the far southwestern city and region of Jazan (see Figure 1). Jazan, in red, stretches along the coast of the Red Sea and is located on the northern border of Yemen. The capital is Jizan City, one of the most important seaport cities in Saudi Arabia.

Figure 1. Regions of Saudi Arabia, adapted from Wikimedia Commons contributors (2019).

Jazan is divided into 14 governorates. Six varieties that are – in my personal experience as a Jazani – socially salient and distinguishable to local Jazani laypeople. These are: Jizani, Arishi, Baishi, Sabyani, Samti, and Faifi[1], which align with six of the governorates: Jizan, Abu Arish, Baish, Sabya, Samtah, and Faifa, which (linguistically) encompasses the remaining nine governorates. According to the General Authority for Statistics, (2019) in Saudi Arabia, Jazan has

[1] Although Faifi is mutually unintelligible with speakers of other Jazani and Saudi varieties, therefore Faifi speakers accommodate their speech (Alfaifi, 2014).

a population of 1.4 million, including 1.1 million Saudis and 260.000 non-Saudis. Therefore, I assume that JA to be spoken by the majority of residents in Jazan.[2]

Based on my personal experience and a pilot language attitude study I conducted (Ruthan, 2017), JA is highly stigmatized by speakers of other SA dialects. Part of this stigma appears to be connected to how JA differs from other SA dialects and Classical Arabic. For instance, the unusual realization or distribution of /r/ in JA seemed to contribute to its negative social evaluation in the pilot study. For instance, Najdi Arabic has two allophones of /r/; emphatic [rˤ] which occurs before or after the vowel /u/, while non-emphatic [r] occurs with /i/, which will be discussed in detail in Chapter 2, Section 2.2.2. Several Saudi respondents, mainly Najdis, mentioned the frequency of non-emphatic [r] they heard in the experimental stimuli, indicating JA speakers may produce more instances of non-emphatic [r] overall than other Saudi speakers or realize non-emphatic [r] in unexpected phonological environments. Although this finding suggested JA /r/ behaves differently from a well-known /r/ allophony in CA, JA phonological environments for /r/ allophony are unknown. Thus, these findings raised the question of whether JA /r/ has predictable allophones or probabilistic sociolinguistic variation, and what phonological environments predict or promote non-emphatic [r] in JA.

JA has other linguistic features that differ from Classical Arabic that may also distinguish it from other dialects in socially negative ways. For instance, JA allows word-initial consonant sequences, as in [ktʊb] "write!" as opposed to Classical Arabic, which typically has at most one consonant in word-initial position, as in [ʔʊk.tʊb]. This feature raises the issue of whether JA has complex or simplex onsets, that is, whether the [k] and [t] in [ktʊb] are in the same syllable [ktʊb]

[2] Non-Saudis who are Arabs, say Yemenis or Egyptian, stick to their Yemeni and Egyptian dialects. As for non-Arab migrant workers, such as Indians and Pakistanis, they speak Gulf Pidgin Arabic (Almoaily, 2014; Bakir, 2010). The bottom line is that non-Saudis in Jazan don't speak JA.

or not [k.tub]. Regarding these two possibilities, I examined the temporal coordination patterns of word-initial clusters to better understand their syllable structure. I also examined whether clusters with different sonority profiles had different syllabic organizations. This part of the study is described in Chapters 2 and analyzed and discussed in Chapter 3.

As a consequence of such features that potentially carry negative associations among other speakers, this study has investigated linguistic and social aspects of these features, focusing on the following:

1. Phonetic and phonological representation of word-initial clusters
2. Salient linguistic features of JA
3. Saudi speakers' attitudes toward JA

JA is an ideal dialect for an investigation of phonology and phonetics due to linguistic features that could inform theoretical models in phonology, such as syllable structure and organization. It is under-researched from a folk linguistic perspective, and its sociophonetics are entirely unexamined. Therefore, the primary goal of this study was to present and examine new data on this understudied dialect, contributing to linguistics in general and sociolinguistics and phonology in particular. In doing so, the study will expand the current understanding of Arabic dialectology and JA. The study provides the first analysis of word-initial clusters and non-emphatic /r/ variation in JA with qualitative and quantitative analyses for production and perception experiments and attitude data.

This chapter provides a historical background on Jazan in Section 1.3, the discovery of oil and migration in Section 1.4, and a background on the classification of Arabic varieties to better understand further comparisons and connections to JA, focusing on SA dialects in Section 1.5. Section 1.6 summarizes the dialectological research on SA, focusing especially on language

attitudes studies. It is followed by an overview of the general attitudes toward JA in Section 1.7. In Section 1.8, I discuss the goals and significance of the dissertation, and Section 1.9 gives an outline of the dissertation.

1.3 Historical Background of Jazan

Throughout history, the Jazan region has been ruled by different rulers[3]. It used to be called Mikhlaf Hakam, then Mikhlaf A'ather, and was better known by Al-Mikhlaf As-Sulaymani relating to the different rulers' names who governed the region (Alaqili, 1989). Before the emergence of Saudi Arabia as a nation state, Jazan was under the control of the Idrisi State (1906-1934), which was led by the ruler Muhammed Ibn Ali Al Idrisi in a revolt movement against the Turks (Ottoman Empire) (Bang, 1996; Vassiliev, 1999). The Idrisi State was geographically located in Jazan and stretched from Asir in the north to Midi (in Yemen now) in the south. The State had spread its power to Al Hudaydah (in Yemen now), which Imam Yahya, the ruler of Yemen, recaptured and annexed, along with part of Tihamah (coastal area of the Arabian Peninsula), and it intended to annexe Asir and Jazan to Yemen. Fearing such intention by the Yemenis, the ruler of the Idrisi State signed a treaty with the Saudis in October 1926, which founded as a protectorate over the Idrisi State, which allowed the Saudis to annex Asir and Jazan. Yemenis claimed that Asir was a part of Yemen, which the Idrisis had torn away. This initiated the Saudi-Yemeni conflict on these territories. After two years of armed conflict on the southern border, on March 20 of 1934 Ibn Saud and Imam Yahya signed a treaty, known as Al Taif treaty, transferring Jazan, Asir, and Najran under the control of Saudi Arabia. The treaty stated that the Saudi and Yemeni peoples are to be considered as a single nation, an indication of peaceful and friendly relations between the two countries and in recognition of their independence. Yet some

[3] For more details see (Alaqili, 1989).

feudal-tribal rulers fled to Saudi Arabia (Vassiliev, 1999; Wynbrandt, 2010). Therefore, it might be reasonable to say that Saudis, very likely Jazanis, came into close contact with Yemeni tribes that migrated to Saudi Arabia at that time till today. Hence, JA is influenced by, and so perceived as sounding like Yemeni Arabic speakers, a topic which will be discussed in Chapter 4.

1.4 The Discovery of Oil, and Migration

With the oil discovery in 1938, Saudi Arabia became an attractive place for jobs. The workforce demand dramatically attracted immigrants to Saudi Arabia (Cordesman, 2003; Vassiliev, 1999; Wynbrandt, 2010). The labor market needed unskilled and skilled workers to work in the agricultural, industrial, and educational sectors (Al-But'hie & Saleh, 2002; Vassiliev, 1999). Workers were from both Arab (Egypt, Sudan, Yemen, Syria, Palestine, Lebanon) and non-Arab (India, Pakistan, Philippines) countries who have left their countries and became migrant workers in Saudi Arabia (Hamdan, 1990; Vassiliev, 1999). Those migrant workers were only permitted to work in Saudi Arabia with legal permission in arrangement with the governments as they fulfilled the needed skills for employment. However, there were many illegal migrants specifically from Yemen (Vassiliev, 1999). In 1963, the number of registered migrants was 76,000, and in late 1972 the number had reached 700,000. By the late 1970s, the number of migrant workers was between 2-3 million, of which Yemenis alone constituted 1 million (Vassiliev, 1999). Nowadays, according to the General Authority for Statistics (2019), there are 9.8 million migrant workers in Saudi Arabia. In Jazan, as mentioned above, there are 260.000 non-Saudis, whom I assume mostly are Yemeni migrant workers. However, these figures are only for legally registered workers. The number of illegal workers, especially Yemenis who find their way to Saudi Arabia across the border, may be equal or exceed the number of legal migrant workers in Jazan specifically and Saudi Arabia generally.

1.5 Arabic Varieties and SA

Arabic can be divided into two main varieties: Standard Arabic, a formal variety taught in schools that has official status in the Arab world, and Colloquial Arabic, consisting of informal Arabic dialects that do not have official status. Standard Arabic comprises Classical Arabic, the language of the Holy Quran and old Arabic literature, and MSA, a combination of a modernized version of Classical Arabic with features and terminology from modern Arabic varieties. Standard Arabic is publicly considered to be a high variety used in education, media, government, arts, religious contexts, and in formal spoken discourse (Abdelali, 2004; Albirini, 2016; Ferguson, 1959). Colloquial Arabic is considered a low variety used in informal communication, TV shows, music, and films. It typically lacks a written form or standardized orthography and varies from one country to another (e.g., Egyptian, Moroccan, Saudi, and Algerian Arabic) with regional varieties within and across each country (Theodoropoulou & Tyler, 2014). Figure 2 illustrates countries and regions where Arabic is spoken.

Among others, Versteegh (2014) and Biadsy, Hirschberg, and Habash (2009) categorized Arabic geo-linguistically into five dialects groups:

1. Egyptian Arabic
2. Gulf Arabic or (dialects of the Arabian Peninsula) (spoken in Bahrain, Kuwait, Oman, Saudi Arabia, the United Arab Emirates, Qatar, and Yemen)
3. Levantine or Syro-Lebanese Arabic (spoken in Jordan, Lebanon, Palestine, and Syria)
4. Mesopotamian Arabic (spoken in Iraq)
5. Maghreb Arabic (spoken in Algeria, Libya, Mauritania, Morocco, and Tunisia)

Figure 2. Arab world map, adapted from Wikimedia Commons contributors (2019a).

Egyptian is the largest spoken variety with 82.5 million speakers, while SA is the fourth largest overall and the largest variety spoken within its category, Gulf Arabic, by 27 million speakers (Sawe, 2018). Saudi Arabia has 13 administrative regions (see Figure 1), which Alghamdi (2003) categorized into five regional dialects (see Figure 3):

1. Southern dialects
2. Najdi dialects (spoken in the central region)
3. Hijazi (spoken in the western region)
4. Gulf Arabic dialects (spoken in the eastern region)
5. Northern dialects

Other linguists, such as (Alrumaih, 2002), have divided the northern dialects into the northern, northeastern, and northwestern regions, resulting in seven Saudi regional dialects instead of five. JA belongs to the southern group.

Figure 3. Regional Saudi dialects (adapted from Alghamdi, 2003).

1.6 Social stratification and evaluation of SA Dialects

Saudi regional dialects are socially stratified. For instance, Najdi Arabic is a prestigious variety since it is spoken by the royal family and because of its linguistic conservatism and resemblance to Classical Arabic (Aldosaree, 2016; Omar & Nydell, 1975). Other scholars, such as Alqahtani (2014), have considered Najdi to be the standard SA dialect.

On the other hand, Hijaz region is the birthplace of Islam, and due to its strategic location, which includes a major trading port, Hijazi Arabic is used for government and commercial purposes and is therefore widely understood in the Arabian Peninsula (Omar & Nydell, 1975). However, Omar and Nydell (1975) described Hijazi as a less “pure” Saudi dialect than Najdi,

because it borrows some linguistic features, most importantly consonants, from Egyptian, Sudanese, and Palestinian dialects. For example, Classical Arabic [θ] is reflected as [t] and [s] in Hijazi Arabic, as in Egyptian and Palestinian dialects, whereas [θ] is retained in Najdi, eastern, southern, and northern dialects. Yet while the social status of Najdi and Hijazi have been substantiated, less is known about the social status of northern and eastern SA dialects. The eastern dialect of SA is labelled by Najdis as "heavy accent" and "big throats" to mean sounding like a drawl, and compared to Bahraini dialect, whereas the northern dialect is labeled as funny but also boring (Alrumaih, 2002).

On the other hand, southern SA dialects in general are socially stigmatized due to linguistic resemblance to or influence from neighboring Yemen (Alrumaih, 2002). Similarities between Yemeni and southern SA dialects were pointed out by the Najdi respondents in a language attitudes study conducted by Alrumaih (2002). Some respondents labeled the southern region "Yemen" and "Sana'a" (the capital city of Yemen). Alrumaih did not, however, pursue the question of which Yemeni features the participants had in mind and whether they included any of the features mentioned below. Najdi participants also provided simple negative labels such as "unbearable" and "bad" for southern dialects. Alrumaih attributed these negative labels to Saudis' negative attitudes toward Yemen and Yemeni immigrants. Thus, the stereotype of Yemeni linguistic influence reported by respondents might be correct, or JA's socially marked features could be entirely unrelated to Yemeni Arabic, despite popular belief.

A major obstacle to confirming whether Yemeni features are driving negative attitudes toward JA is the absence of thorough descriptions of JA. Therefore, the current study elicited information about socially salient features of JA via a language attitude survey. Unlike Alrumaih (2002) and Aldosaree (2016), this study asked participants to describe specific linguistic

components of JA that have attracted their attention. In this way, the study sought to determine key linguistic features of JA affecting Saudi listeners' attitudes toward it and whether they included features that JA shares with Yemeni Arabic.

1.7 General Attitudes about JA

Given that Saudi dialects are socially stratified, JA, like other southern SA dialects, is socially stigmatized. When laypeople label a JA or southern SA speaker, they mostly say that JA speakers sound like Yemenis. These attitudes were observed personally by the researcher and attested by Alrumaih (2002) regarding the phonological features, proximity, and number of migrants in the southern region. Such findings and observations implied the same attitudes could apply to JA, since JA shares some features with Yemeni Arabic. As in other countries, SA dialects such as JA that are close to the national borders are susceptible to external linguistic (areal) features from adjacent areas (Alrumaih, 2002; Chambers & Trudgill, 1998). JA and other southern dialects have some attested shared features with Yemeni Arabic, such as word-initial clusters (Hamdi, 2015; Ruthan et al., 2019). Other features like affixation and palatalization of /k/ to /ʃ/ in Yemeni Arabic are also found in some southern dialects of SA in the cities of Abha and Najran (Watson, 1992). Furthermore, the southwestern SA definite article /ʔam/ "the" is attested in JA, the dialect in Rijal Alma, and Yemeni Arabic (Asiri, 2009; Hamdi, 2015; Watson, 2011). Finally, /r/, described as non-pharyngealized in Yemeni Arabic (Watson, 2002), might have a similar feature in JA, as briefly discussed in Chapter 4.

Furthermore, Jazan borders Yemen to the south and has a high proportion of Yemeni migrants. I attribute some negative attitudes associated with Yemen to its lower level of wealth compared to Saudi Arabia. For instance, Yemen's GDP in 2018 was USD 26.91 billion, while Saudi Arabia's GDP was USD 786.522 billion (World Bank, 2018). Yemen also has lower-quality

education. In 2012, the international assessment results for the Trends in International Mathematics and Science Study showed a lower average grade for fourth-grade students, 248, compared to students from neighboring countries like Saudi Arabia, with an average of 410, in the standard mathematics test (Zakout, 2014). Those negative socio-economic factors of Yemen cast a shadow over JA. Such attitudes and beliefs are accumulated stereotypes that have been associated with Yemen over the years and are not merely due to the contemporary war in Yemen that Saudi Arabia is involved in.

Stereotypes and negative attitudes are reflected in Saudi media when a Jazani speaker is characterized in a TV show. For instance, in the Gulf and Saudi satirical comedy shows *Wifi*[4] and *Hyperloop*,[5] a mall security guard was portrayed with a Jazani accent, suggesting a Jazani person is someone with low socio-economic status. Another example is *Shabab Al-Bomb* ("Youth Energy"), a well-known Saudi TV show running for eight seasons 2012-2019, which has a character with a JA accent who always appears uneducated and uncivilized in worn-out clothes. I argue that such illustrations reflect stereotypical views about Jazani people's social status.

The aforementioned common features between Jazani and Yemeni Arabic have not been compared or investigated in terms of whether they contribute to the identification of speakers of these dialects, mainly Jazani speakers. With the exception of Himli (2014), Hamdi (2015), Shamakhi (2016), Ruthan (2017), and Ruthan et al. (2019), no analytical work or attitude studies exist for JA. This gap motivated the current study's twin aims: 1) to identify socially salient phonetic features of JA that have not been described and 2) to determine the role they play in shaping Saudi attitudes toward JA.

4 https://www.youtube.com/watch?v=p2stsCCNHrs, Retrieved on December 24, 2019.
5 https://www.youtube.com/watch?v=MfY3QNWZQx0, Retrieved on December 24, 2019.

1.8 Purpose and Significance of the Study

This dissertation explores linguistic features of JA from phonetic, phonological, and sociolinguistic perspectives. JA has several interesting linguistic features that had not previously been explored. This dissertation focuses on two such features: Word-initial consonant clusters (Hamdi, 2015; Ruthan et al., 2019), and /r/ (Ruthan, 2017). The study addresses these features in light of the syllable structure theory in phonology (Fudge, 1969; Kahn, 1976), folk linguistics, and attitudes in sociolinguistics (Labov, 1966; Preston, 1986).

The dissertation phonologically describes word-initial consonant clusters and acoustically examines whether JA has complex or simplex onsets. In the very limited literature on JA, there is no prior discussion of this question. Therefore, the dissertation addresses this issue using the correlation between syllable structure organization and temporal coordination (Browman & Goldstein, 1988).

The dissertation also provides a novel description and phonological analysis of /r/ (Ruthan, 2017), and examines the social meanings associated with this feature. JA /r/ shows unusual realizations, non-emphatic and emphatic, or distributions of /r/ different from that in other Saudi dialects like Najdi and Hijazi Arabic. Such different realizations play a role in shaping listeners' attitudes to JA. Since JA phonological environments for /r/ allophony are unknown, this dissertation fills in this gap by describing the phonological environments for /r/ in JA.

The dissertation seeks to determine how these two linguistic features, word-initial consonant clusters and /r/, contribute to the identification of JA speakers, the possible meanings associated with them, and attitudes of Saudi speakers regarding JA. Therefore, the study uses an attitude survey to uncover Saudi speakers' attitudes toward JA and an identification task to find out how these features contribute to the identification of JA speakers.

Since there was no extant analytical work on the phonology or sociolinguistics of JA, a primary goal of this study is to build on the thriving body of literature that exists on other SA dialects. This study expands Arabic dialectology by shedding light on an understudied and stigmatized dialect, JA, providing a descriptive and analytical reference for word-initial consonants sequences and /r/. By analyzing these phenomena, the study will contribute to linguistic research on syllable structure and the temporal coordination approach, by showing the behavior of word-initial sequences. The phonological analysis of /r/ in JA will add to an existing literature on controversial /r/ in Arabic dialects. The acoustic and the phonological analyses of word-initial clusters and /r/ will allow for a better grasp of the behavior of these two features in Arabic dialects.

The study demonstrates and supports the effectiveness of acoustic measurement as a tool to understand syllabic organization. Thus, this project will help other scholars and lead to an expansion in studying syllable structure in more languages and dialects due to greater accessibility, in contrast to the articulatory method, which is more expensive. JA is an understudied variety of Arabic, so the data and analyses will contribute to the dialect itself and to Arabic dialectology in general.

To date, the negative attitudes toward JA have only been described anecdotally. This work is the first of its kind to document and conduct qualitive and quantitative analysis of people's beliefs and attitudes regarding JA, setting the stage for future attitude surveys. The identification and language attitude studies of JA will facilitate a better understanding of the stereotypes and beliefs about JA, which will add to the folk linguistics literature. The phonological analysis of /r/ and word-initial clusters combined with the attitude analysis will allow for a better understanding of the connection between these two linguistic features and how they contribute to people's attitudes about JA and the social meanings they convey.

1.9 Outline of the Study

This study is organized as follows. Chapter 2 presents a phonological background of JA, focusing on word-initial consonant sequences and syllable structure, and a phonological description of /r/. Chapter 3 gives an overview of the articulatory and acoustic production experiments. Chapter 4 gives the sociolinguistic background, including studies on perceptual dialectology and attitudes about English and SA dialects; discusses relevant sociophonetic studies; and presents the results for JA perception and attitudes. Chapter 5 discusses the overall results, contributions, and directions for future research.

1.10 Note to the Reader

Descriptions and analyses in this dissertation are based on linguistic evidence and not on social prejudice, criticism, or loyalty to one group or another. The author believes in the equal linguistic status of variation, and by this work he does not mean to belittle or look down on one variety and praise another. All spoken varieties of a language are, and should be, respected.

CHAPTER 2. PHONOLOGICAL BACKGROUND

2.1 Introduction

This chapter describes Jazani Arabic (JA), a subregional dialect of southwestern SA spoken in the southwestern region of Jazan, phonology, including phonemes and allophones, syllable structure, and phonological processes and variation. Despite the limited literature on this variety, some work on Classical Arabic (CA), the language of the Holy Quran and old Arabic literature, and Modern Standard Arabic (MSA), a combination of a modernized version of Classical Arabic with modern Arabic varieties, could be used as a reference point to discuss JA consonants, vowels, and syllable structure.

2.2 JA Phonology

2.2.1 JA Phonemic Inventory

JA is a variety of Arabic, and its phonemes and vowels are similar to those of CA and MSA. As a point of reference, Arabic is an Afro-Asiatic language with an inclusive consonantal phonemes system that resembles those of other Semitic languages, in which guttural phonemes are a salient feature, such as /χ, ʁ, ʕ, ħ, ʔ, h/ (Watson, 2002).

Based on my linguistic knowledge, observation, experience, and native intuition, JA has 27 phonemes (see Table 1), lacking the /dˤ/ of CA and MSA, although some varieties of JA, such as Jizani (a subdialect of Jazani Arabic spoken in Jizan City, see Chapter 1 Section 1.2), have only 25 phonemes, lacking /θ/ and /ð/ besides /ðˤ/, compared to CA and MSA. Alveolar phonemes constitute the largest set, comprising /t, d, tˤ, s, z, sˤ, r, n, l/. JA exhibits most of the phonemes that CA and MSA have, except two that are superseded with reflexes (Table 1). For instance, JA has /g/ as a reflex for MSA and CA /q/. JA uses the voiced emphatic interdental fricative /ðˤ/ rather than the emphatic voiced stop /dˤ/ of CA and MSA, due to a complete merger, which is also attested

in other Saudi dialects (Al-Raba'a, 2015). However, based on my observation, in formal contexts, such as reciting from the Quran, presenting the news on TV, or giving a formal speech, the two consonants mentioned above are produced as /q/ and /dˤ/.

Table 1. Consonant inventory of JA.

Place of Articulation / Manner of Articulation	Bilabial	Labiodental	Dental	Alveolar	Post alveolar	Palatal	Velar	Uvular	Pharyngeal	Glottal
Stop	b			t d tˤ *dˤ			k g	*q		ʔ
Fricative		f	θ ð ðˤ	s z sˤ		ʃ		χ ʁ	ħ ʕ	h
Affricate					dʒ					
Nasal	m			n						
Approximant	w			l		j				
Trill				r						

Note. *marks phonemes present in CA and MSA but not JA.

Before discussing the proposed allophones of the phonemes presented above, it is important to compare phonemes in environments to demonstrate that they are contrastive in JA. As it is impossible to find one environment for all consonantal phonemes in JA, based on my native knowledge, the following examples in (1) illustrate the maximum number of consonantal phonemes in word-initial position in the same phonological environment, and (2) and (3) illustrate the remaining consonantal phonemes in other phonological environments. The first set of consonantal phonemes are given in (1).

1) JA consonantal phonemes in [-æli] phonological environment

/b/	[bæli]	“old”	/f/	[fæli]	“my luck”
/dʒ/	[dʒæli]	“he came to me”	/g/	[gæli]	“he is frying”
/ħ/	[ħæli]	“sweet”	/χ/	[χæli]	“my uncle”
/ʕ/	[ʕæli]	“high”	/ʁ/	[ʁæli]	“expensive”
/m/	[mæli]	“what”s wrong with me!”	/ʔ/	[ʔæli]	“self-powered”
/s/	[sæli]	“absent minded”	/ʃ/	[ʃæli]	“my scarf”
/r/	[ræli]	“saw for me”/ “rally”	/tˤ/	[tˤæli]	“he is painting”
/d/	[dæli]	“my letter d”	/ð/	[ðæli]	“my letter th”

The second set of JA consonantal phonemes are given in (2).

2) JA consonantal phonemes in [-om] phonological environment

/l/	[lom]	“blame”	/j/	[jom]	“day”
/t/	[tom]	“twin”	/k/	[kom]	“pile”
/sˤ/	[sˤom]	“fasting”	/θ/	[θom]	“garlic”
/n/	[nom]	“sleep”			

The third set of JA consonantal phonemes are given in (3).

3) JA consonantal phonemes in [-arrʊh] phonological environment

/ðˤ/	[ðˤarrʊh]	“it harmed him”	/z/	[zarrʊh]	“he twisted it”
/h/	[harrʊh]	“he tore it up”	/w/	[warrʊh]	“show him”

JA has three long vowels, /i, æ, u/, which are represented orthographically as ي ، ا ، و respectively. It also has 3 short vowels, /ɪ, a, ʊ/, the counterparts of the long vowels, which are only represented with diacritics in the Arabic orthography, ِ ، َ ، ُ, on consonants, but such

diacritics are usually not used, meaning these vowels normally lack a clear representation in the written form (Al Ameri, 2009). In addition, based on diachronic evidence, JA has two monophthongs; /e/, and /o/ which substitute the combinations (diphthongs) /a/ + /j/ and /a/ + /w/ in CA. That is, these diphthongs monophthongize to long mid-high vowels, so /bajt/ "house" and /sˤawt/ "voice" surface as [bet] and [sˤot] in JA. This pattern appears in other Arabic varieties such as Cairene Arabic (Youssef, 2010). Figure 4 presents the JA vowel system with examples in (4).

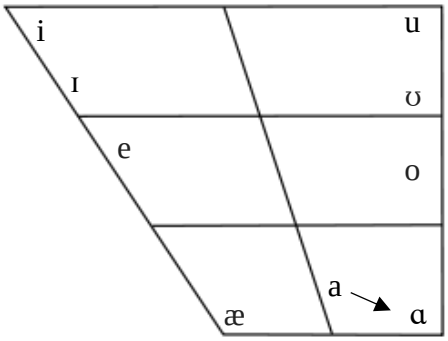


Figure 4. Vowel inventory of JA.

4) Vowels of JA

/i/	[din]	"religion"	/ɪ/	[dɪn]	"get down!"
/æ/	[dʒæff]	"dry"	/a/	[dʒaff]	"it dried"
/u/	[ʕud]	"A lute/ stick"	/ʊ/	[ʕʊd]	"count!"
/e/	[ʃeb]	"white hair"	/o/	[ʃob]	"hair wash"

2.2.2 Allophonic Variation

In JA, some vowels, namely /a/, and consonant phonemes, such as /l/, /z/, and /r/, are realized differently in different phonological conditions (and different varieties of Arabic). In this section, I first present and allophonic rules for vowels, followed by consonants allophones.

2.2.2.1 Allophones of /a/

As can be observed from vowel chart in Figure 4, based on my observation, JA lacks [ɑ] as a distinct phoneme. The phoneme /a/ is realized as the allophone [ɑ] when directly or indirectly adjacent to dorsal and emphatic consonants, as in (5).

5) /a/ realization as /ɑ/

a. [χɑlˤɑːsˤ] "enough"

b. [rˤɑkɪb] "rider"

2.2.2.2 Allophones of /l/

In JA, based on collected data, I observe /l/ to have two allophones, light/non-emphatic [l], and dark/emphatic [lˤ]. The behavior of the alternation between non-emphatic and emphatic /l/ is unknown and has not been described yet. In JA, /l/ appears to always surface as light or non-emphatic [l] as in (6) and only surfaces as emphatic [lˤ] when it is in the same word emphatic consonants, as in in (7).

6) Non-emphatic [l] (JA)

a. [ʕælam] "people/world"

b. [fil] "elephant"

c. [lon] "color"

7) Emphatic [lˤ] (JA)

a. [mɑlˤɑsˤ] "he got away"

b. [ʁɑlˤɑtˤ] "wrong"

c. [χɑlˤɑtˤ] "he mixed"

However, sometimes /l/ is realized as a non-emphatic variant even when it is in a uvular or emphatic environment, as in (8).

8) Non-emphatic [l] in uvular and emphatic environment

a. [ʁæli] “expensive”

b. [χæli] “uncle”

c. [sˤælah] “living room”

d. [tˤælıb] “a student”

At first sight, I speculate this to be attributed to the vowels rather than the uvular or emphatic environment. I initially assumed that, if the underlying form for the preceding vowel is /a/, then the vowel is realized as [ɑ] and therefore the /l/ is realized as emphatic [lˤ], whereas when /æ/ surfaces as [æ] rather than [ɑ], /l/ is non-emphatic [l]. This attribution sounds plausible and the pattern seems consistent until patterns like those in (9) are encountered.

9) Non-emphatic [l] (JA)

a. [χall] “vinegar”

b. [sˤall] “pray!”

c. [tˤalab] “an order”

Although the underlying form of the vowels in (9) is /a/, the vowels are realized as [a] and /l/ surfaces as non-emphatic [l] despite being in a uvular consonant environment. However, it turns out that emphasis spreading is accountable for the alternation of /l/ between emphatic and non-emphatic. That is, emphatic consonants spread emphasis (pharyngealization) to the vowel and /l/, which consequently surface as a back vowel [ɑ] and emphatic [lˤ]. However, I propose in JA emphasis only spreads leftward (regressively), but not rightward (progressively). For instance, the examples in (7) show that the emphatic consonants [sˤ] and [tˤ] spread emphasis to the vowel /a/ and /l/ to surface as [ɑ] and [lˤ] in [mɑlˤɑsˤ] and [χɑlˤɑtˤ], whereas the same consonants [sˤ] and [tˤ] don’t spread emphasis in [sˤælah] and [tˤælıb]. Therefore, the pattern for plain and

pharyngealized/emphatic /l/ in JA appears to be governed by the existence and the spread of emphasis via emphatic consonants.

In contrast, in CA /l/ is always realized as plain (non-emphatic) [l], except in the oft-cited example in the name of Allah /ʔɑlˤ.lˤɑh/ as emphatic or velarized [lˤ] (Ferguson, 1956; Omar & Nydell, 1975; Watson, 2002). Replacing [lˤ] with the plain variant in this word results in an ill-formed output */ʔal.lah/. However, this /l/ is realized as non-emphatic [l] in its derivations as in /ʔɪlæh/.

In other varieties, such as Emirati Arabic, the /l/ phoneme has allophones subject to rules that govern the alternation between the two allophones. For instance, /l/ is realized as [lˤ] when followed or preceded by emphatic consonants, as in [sˤaalˤah] "living room" and [ðˤelˤm] "injustice" (Al Ameri, 2009). However, alternation between the emphatic and non-emphatic allophones is possible in some words. Thus, there is no allophonic rule for these cases, which are attributed to sociolinguistic variation among Emirati speakers, for instance in words such as [galˤbˤ] / [galb] "heart" and [galˤam] / [galam] "pen."

2.2.2.3 Allophones of /z/

In a similar vein, /z/ can be non-emphatic or emphatic in JA. /z/ always surfaces as plain [z], as in (10), and only surfaces as emphatic [zˤ] when in the same word of emphatic consonants, as in (11).

10) Non-emphatic [z] (JA)

a. [zanbil] "basket of palm fronds"

b. [zorbah] "bundle"

c. [tˤæzah] "fresh"

11) Emphatic [zˤ] (JA)

a. [zˤɪtˤitˤ] “tight”

b. [zˤɑlˤɑtˤ] “money”

As in the case with /l/, emphasis spreads to /z/ only regressively, but not progressively. The examples in (10) show that /z/ is realized as non-emphatic [z] when not in the emphatic consonant environment. In (10c), although /z/ appears in the emphatic consonant environment, it surfaces as non-emphatic [z], indicating that emphasis spread does not occur progressively, while it occurs regressively as in (11).

2.2.2.4 Allophones of /r/

Along the same lines, in JA, I observe /r/ to surface as non-emphatic [r] and emphatic [rˤ], however the phonological environments for the alternation between the two allophones is a bit complicated and has not been explained yet. Based on collected data and my observations and analyses, I propose that /r/ surfaces as non-emphatic [r] clearly when followed or preceded by high front vowels /i/ and /ɪ/ as in (12), and surfaces as emphatic [rˤ] when followed or preceded by high back vowels /u/ and /ʊ/ as in (13).

12) Non-emphatic [r] before and after [i] and [ɪ] (JA)

a. [riʃ] “feathers”

b. [rɪdd] “respond”

c. [tˤir] “fly”

d. [sɪrr] “a secret”

13) Emphatic [rˤ] before and after [u] and [ʊ] (JA)

a. [rˤuħ] “go!”

b. [rˤʊʃʃ] “spry!”

c. [nurˤ] “light”

d. [ħʊrˤrˤ] “free”

In the case of the low vowels /æ/ and /a/, the alternation between [r] and [rˤ] seems to be governed by the position, whether it preceded or followed by the vowels [a], and [æ]. /r/ surfaces as non-emphatic [r] when preceded by [a] and followed by a consonant (non-emphatic consonant) as in (14). It surfaces as emphatic [rˤ] when followed by [a] or an emphatic consonant as in (15).[6]

14) Non-emphatic [r] after [a] (JA)

a. [bard] “cold”

b. [farʃ] “a mattress”

15) Emphatic [rˤ] before and after [a] (JA)

a. [barˤad] “hail”

b. [fɑrˤðˤ] “imposition”

c. [rˤɑmɑðˤ] “hot floor”

In other Saudi varieties, such as Hijazi and Najdi Arabic, the phonological environments of emphatic [rˤ] and non-emphatic [r] is discussed when examining vowels alternations. In describing vowels alternations in bedouin Hijazi Arabic, Al-Mozainy (1981) provided evidence for the contrast between /i/ and /u/, showing how /r/ is realized as non-emphatic [r] when followed or preceded by the high front short or long vowel /i/, as in (16), while it is realized as emphatic [rˤ]

[6] The patterns and the environments from the examples above are preparatory and may not account for other alternation patterns in the dialect. I think /r/ can sometimes surface as either non-emphatic or emphatic based on speakers’ individual differences, a topic I leave for future research.

when followed or preceded by the high back short or long vowel /u/, as in (17). He also argued that there is only one low vowel, /a/, in Bedouin Hijazi Arabic which is realized differently as [a], [æ], and [ɑ], based on the phonological contexts. Al-Mozainy (1981) argued that /r/ is realized as non-emphatic when it is in the same syllable with the high front vowel /i/, as in (18a), or if /a/ which is adjacent to /r/ has altered to /æ/ due to an assimilation process to the preceding or following vowel as in (18b), and when /r/ is followed by a [+cor] consonants as in (18c-d), while it is realized as emphatic when it is not followed by [+cor] consonants, meaning labial and guttural consonants, as in (19).

16) Non-emphatic [r] before and after [i] in Bedouin Hijazi

a. [ki:r] “bellow”

b. [giri:ʃ] “shackling”

c. [mirr] “it was passed by”

17) Emphatic [rˤ] before and after [u] in Bedouin Hijazi

a. [ku:rˤ] “camels’ saddle”

b. [grˤu:ʃ] “money”

c. [murˤrˤ] “pass!”

18) Non-emphatic [r] before and after [a] in Bedouin Hijazi

a. [girbæh] “a goat skin bottle”

b. [ʔærsil] “send!”

c. [gærʃ] “a piaster”

d. [hærdʒ] “a talk”

19) Emphatic [rˤ] before and after [a] in Bedouin Hijazi

a. [garˤm] “worrier”

b. [farˤx] “chick”

c. [jarˤɣab] “he wants”

d. [jarˤfa] “he picks up”

In a similar vein, Alqahtani (2014) lightly discussed one aspect of /r/ in Najdi Arabic, stating that /r/ is realized as emphatic [rˤ] when followed or preceded by the short or long high back vowel /u/. Consider the following examples in (20).

20) Emphatic [r] before and after [u] in Najdi Arabic

a. [grˤuːʃ] “coins”

b. [ħrˤuːb] “men from Harb tribe”

c. [murˤrˤ] “bitter”

d. [burˤrˤ] “wheat”

In other Arabic varieties, such as Muslim Baghdadi Arabic (MBA), according to (Rahim, 1980), non-emphatic [r] appears before a high front vowel [i/iː] or glide [j] in the same syllable, as in (21), whereas emphatic [rˤ] appears in the adjacency of obstruent emphatics /sˤ, ðˤ, tˤ/, as in (22a-b), the back vowels [a], [o], [u] as in (22c-e).

21) Non-emphatic [r] before and after [i] in MBA

a. [bariːd] “post office”

b. [risam] “he drew”

c. [rjaːdʒiːl] “men”

d. [ʕaːrja] “naked”

22) Emphatic [rˤ] in various environments in MBA

a. [musˤrˤa:n] “intestine”

b. [warˤtˤa] “plight”

c. [rˤanna:n] “resounding”

d. [rˤubuʕ] “quarter”

e. [θo:rˤ] “bull”

According to the patterns observed in the examples above, the underlying form for JA is the non-emphatic /r/, which places it under the “plain-R dialects” to which most Peninsular Arabic dialects belong, including Hijazi, Najdi, Yemeni, Omani, and MBA[7] (Youssef, 2019).

Other Arabic dialects, such as Rural Palestinian Arabic (RPA) (Younes, 1993, 1994) has the emphatic /rˤ/ as the underlying form, which goes under de-emphasis in limited phonological environments. According to Younes (1993, 1994), /rˤ/ in RPA is behaving as the primary emphatics /sˤ, tˤ/. This assumption is supported by three facts; (i) phonological evidence that shows /rˤ/ to appear only in the same environment with the low back [ɑ] as the primary emphatics /sˤ, tˤ/, as in [nɑ:rˤ] “fire,” [bɑ:sˤ] “bus,” and [tˤɑll] “he appeared,” (ii) morphological rule of ablaut, in which [ɑ] and [u] alternate in the perfect and imperfect verb forms as in [ħɑrˤɑθ] – [ji-ħrˤuθ] “to plough,” [nɑsˤɑb] – [ji-nsˤub] “to set up,” but not [ħamal] [ji-ħamil] “to carry,” (iii) vowels alternation with the feminine suffix allomorphs [a/ɑ] or [i], in which emphatic /rˤ/ chooses [a] as the primary emphatics, as in [miħta:rˤ-a] “bewildered,” [basi:tˤ-a] “simple,” but not [ʃri:ʧ-i] “partner.” In RPA /rˤ/ is de-emphaticized when it is before one of the following velar consonants

[7] Based on the examples in (22), the emphatic /rˤ/ appears to be the phoneme since it is the elsewhere allophone, however, Youssef (2015) provides evidence from epenthetic vowel which breaks final consonant clusters, a pattern which invalidates emphatic /rˤ/ as the underlying form.

/k, x, ɣ/, as in [tˤɑrak] “he knocked,” [sarax] “he screamed,” and [barɣaʃ] “mosquitoes.” It is also de-emphaticized when it is adjacent to non-emphatic coronals /θ, t, d, s, z, n, ʃ, ʧ, ʤ, j/, as in [kart] “card,” [mars] “smashing,” and [marʤ] “meadow,” or adjacent to non-low front vowels /i, i:, e:/, as in [mba:riħ] “yesterday,” /kbi:r/ “big,” and /ɣe:rak / “other than you” (Younes, 1994). According to Youssef (2019), RPA and Levantine dialects, such as Jordanian Arabic (Bani-Yasin & Owens, 1987) are categorized as the “emphatic-R dialects.”

While the distinction between [r] and [rˤ] is allophonic in the *“*plain-R dialects,” and only an emphatic /rˤ/ that de-emphaticizes in the “emphatic-R dialects,” it is contrastive in Egyptian Cairene Arabic (ECA) (Broselow, 1976; Watson, 2002; Youssef, 2014), and Moroccan Arabic (MA) (Heath, 1987, 1997), as minimal pairs are attested in words like [ʃarˤʕi] “legal,” [ʃarʕi] “my street,” [ʔaṛˤbaṛˤ] “a Wednesday” [ʔarbaʕ] “he guzzled” in ECA, and [ḍaːrˤ] “house,” [daːr] “he did,” and [ẓrˤaʕ] “whole wheat,” [zraʕ] “he sowed” in MA (Broselow, 1976; Youssef, 2019). According to Youssef (2019), ECA and MA are categorized as the “split-R dialects.”

Now that we have discussed JA consonant and vowel phonemes and allophones, and covered an important topic, /r/, that we will visit again in Chapter 4, we can turn to discuss another focal topic, JA syllable structure, in the next section.

2.3 The Syllable

The syllable is a significant unit in phonological theory as it represents how segments are grouped (Blevins, 1995; Fudge, 1969; Kahn, 1976). Evidence for the existence of syllables as phonological units include native speakers’ intuition and ability to syllabify or count syllables (Derwing, 1992; Treiman & Danis, 1988), language games (Bagemihl, 1995; Treiman, 1983), patterns observed in reduplication (Bagemihl, 1991; Steriade, 1988), speech errors (Fromkin, 1971; Shattuck-Hufnagel, 1983), metrical patterns in speech (Dell & Elmedlaoui, 2012), speech

production and phonetic forms (Goldstein et al., 2007), and speech perception (De Jong et al., 2004; Redford & Randall, 2005).

The syllable is included in phonological theory because syllables simplify the description of sound patterns cross-linguistically. Further evidence for the syllable comes from typological patterns across languages while describing sound patterns (Clements & Keyser, 1983; Selkirk, 1982). Evidence for syllables with respect to sound patterns includes consonant devoicing in German (Vennemann, 1972), nasal place assimilation in Spanish (Hooper, 1972), allomorphy in Italian (Davis, 1990b), vowel lengthening in Icelandic (Itô, 1986), pitch accent in Japanese (Kubozono, 2017), and tonal patterns in Chinese (Duanmu, 2009).

Articulatory evidence for syllables is how they correlate with the timing of consonants and vowels, referred to as temporal stability (Browman & Goldstein, 1988; Byrd, 1995; Goldstein et al., 2007; Hermes et al., 2013; Shaw et al., 2011). Along the same lines, experiments have used acoustic techniques to demonstrate different types of syllable structures (Selkirk & Durvasula, 2013). This will be discussed in detail in Chapter 3.

With this brief background about the notion of the syllable, I turn in the next sections to discuss the syllable structure in JA, covering major topics related to the current dissertation. The description of JA syllable structure in the next section is based on the author's knowledge as a native Jazani speaker.

2.3.1 JA Syllable Structure

JA syllables must have a consonant in the onset, as in (23). In other words, JA does not allow a syllable to start with a vowel.

23) Single Onset (JA)

a. [ɱaktabah] “library”

b. [galam] “pen”

c. [tˁælɪb] “a student”

Therefore, syllables start with one consonant as an essential component and end with a vowel (open syllable), as in (24a-b), or with a single consonant in the coda (closed syllable) as in (24c).

24) Open and Closed Syllable (JA)

a. [ða] “this”

b. [fi] “in”

c. [bæb] “door”

JA also allows consonant sequences like [rs] to form word-final consonant sequences, as in (25). It also allows consonant sequences like [kt] to form word-medial clusters, as in 26).

25) Word-Final Consonant Sequences

a. [dars] “a lesson”

b. [naml] “ants”

c. [samn] “ghee”

26) Word-Medial Consonant Sequences

a. [jiktʊb] “he writes”

b. [jiʃrab] “he drinks”

c. [jʊrsʊm] “he draws”

Such patterns in (25) and (26) are not different from those in CA and MSA. However, the focus of the phonological component of the dissertation is on word-initial consonant sequences, as in (27), which are allowed in JA but not in CA and MSA.

27) Word-Initial Consonant Sequences

a. [ktʊb] “write!”

b. [drʊs] “study!”

c. [ʃrab] “drink!”

Such word-initial sequences are the result of the well-known diachronic process of glottal stop and vowel deletion in CA and a synchronic process in JA, to be discussed in Section 2.4.1.

Therefore, JA has four syllable types: light CV, heavy CVV, CVC and superheavy CVVC. The examples in (28) through (30) illustrate these syllable types in JA.

28) Light Syllable

a. CV [ða] “this”

29) Heavy Syllable

a. CVV [sˁæ.ba] “he went”

b. CVC [ħʊg.lah] “A swamp”

30) Superheavy Syllable

a. CVVC [gul] “say!”

Although JA allows word-initial consonant sequences of two and three consonants, they cannot be considered as syllables of type CCVX or CCCVX, as I will argue later that only the prevocalic consonant in #CCVC is an onset and part of the syllable, and the first consonant is extrasyllabic. In JA, initial triconsonantal sequences rarely occur in rapid speech, due to vowel deletion as in [stræ.ħah] “resort.” Such a pattern has been reported to occur in some Levantine dialects, in words like [striiħ] “rest!” (Mitchell, 1993: 60). Similarly, whether triconsonantal consonant sequences form a syllable type of CCCV is questionable and beyond the scope of this dissertation. Likewise, JA allows CVCC as in [samn] “ghee.” Yet, the final consonant in such

sequences is questionable, whether it is part of the same syllable or it is extrasyllabic. Thus, CVCC cannot be considered as a syllable type in JA till proven, which is likewise beyond the scope of the dissertation.

Generally speaking, word-initial clusters, such as #CCCVX or #CCVX, either behave like a complex onset, as in English, or like a simplex onset, as in Moroccan Arabic. That is, complex consonant clusters like #CCCVX and #CCVX are parsed in the same syllable, whereas in simplex onsets, the first one or two consonants are in a different syllable from that of the prevocalic consonant: #CC.CVX and #C.CVX (Boudlal, 2001; Brownian & Goldstein, 1988; Kiparsky, 2003). While the syllable structure of such word-initial clusters can be a debatable issue in Arabic dialects, as in the case of Moroccan Arabic (Benhallam, 1990; Boudlal, 2001), it is now possible to determine the structure of these clusters by examining the temporal stability of consonants and vowels, as will be discussed in Chapter 3, focusing only on patterns like (27). The following sections outline phonological variation in phonemes, and glottal stops and vowels pertinent to this part of the dissertation.

2.4 Phonological Variation

As described in Chapter 1, Section 1.2, there is variation across the five spoken varieties of JA. First, I discuss variation in consonants, then I move to discuss variation in terms of syllable structure and discusses some differences relevant to the study.

In JA, based on my native knowledge, there are stylistic variations between [q] and [g], [θ] and [t], [ð] and [d], and [ðˤ] and [d] which is attributed to formal and informal settings. For example, in all varieties of JA, I find [q] to be used in formal speech when Jazani speakers use MSA, otherwise it is always realized as velar [g], as in many Saudi dialects, such as Najdi (Al

Motairi, 2015; Ingham, 1994; Rosenhouse, 2006; Versteegh, 2014) and Hijazi Arabic (Abdoh, 2011; Omar & Nydell, 1975). The examples in (31) illustrate the variation between [g] and [q].

31) Variation of [g] and [q]

	JA	MSA	Gloss
[g] – [q]	[galam]	[qalam]	"pen"
	[gamar]	[qamar]	"moon"

In other specific varieties of JA, as in Jizan city, and Farasan Islands (Abbas, 2018), the spoken varieties alternate freely between [θ] and [t], [ð] and [d], and [ðˤ] and [d]. That is, fricatives are found in formal setting speech, while stops are in informal speech. Examples in (32) illustrate this variability.

32) Variation of [θ]-[t], [ð]-[d], and [ðˤ]-[d]

	Farasani and Jizani of JA	MSA	Gloss
[θ] – [t]	[tom]	[θom]	"garlic"
[ð] – [d]	[dæb]	[ðæb]	"melted"
[ðˤ] – [d]	[naddærah]	[naðˤðˤærah]	"sunglasses"

2.4.1 Glottal Stop and Vowel Deletion

A discussion of word-initial consonant sequences in JA requires an examination of a phonological phenomenon in which glottal stops and vowels are deleted, resulting in word-initial consonant sequences. Synchronically, in all JA varieties, there is a tendency to delete the glottal stop /ʔ/ and the following vowel in word-initial position in nouns, adjectives, and verbs, especially imperative verbs, which were the focus of the present study. This deletion occurs in syllables of the type CVC.CVC, which appears to occur in unstressed syllables, resulting in word-initial consonant sequences (CCVC). The examples in (33) illustrate glottal stop and vowel deletion in

JA.

33) Alternation of Glottal Stop and Vowel (JA)

Careful speech	Casual speech	Gloss
a. [ʔasmaʕ]	[smaʕ]	"listen!"
b. [ʔɪstæð]	[stæð]	"a teacher"

This phenomenon is common in informal settings and casual rapid speech, while in formal and careful speech settings, Jazani speakers produce such words with the glottal stop and following vowel, as shown in (33). As a native speaker of JA, I have observed that Samti speakers tend to delete more often than any other variety of JA. To clarify, all Jazani varieties' speakers alternate between both forms (deletion and no deletion). However, all, except Samti, varieties have more tendency to retain the glottal stop and the vowel, while Samti speakers have more tendency to elide them[8].

In JA, there are cases where the glottal stop and vowel are retained in all varieties, as attested in (34).

34) Word-Initial Glottal Stop (JA)

a. /ʔasad/	[ʔasad]	"a lion"
b. /ʔɪbrah/	[ʔɪbrah]	"a syringe"

Therefore, the deletion of the glottal stop and the vowel does not occur in (34), otherwise it would results in ill-formed words, *[sad] and *[brah]. I attribute that to whether the glottal stop is in the underlying representation or is epenthetic. If it is in the underlying representation, the glottal stop remains but is deleted when it is an epenthetic consonant, as shown in (33).

[8] The analyzed data in Chapter 3 for the word-initial sequences was only collected from speakers of the Samti variety to ensure more systematic results. However, the descriptive data in this chapter relate to Samti and the other varieties and highlight the differences among them.

In medial position, Jazani dialects delete the glottal stop even if it is in the underlying representation, resulting in compensatory lengthening, lengthening or gemination of the stem vowel. Some examples are furnished in (35).

35) Word-Medial Glottal Stop (JA)

a. /kaʔs/ [kæ:s] “a trophy”

b. /raʔs/ [ræ:s] “head”

c. /jaʔkul/ [jæ:kul] “he eats”

d. /jaʔba/ [jæ:ba] “he refuses”

A synchronic evidence that the glottal stop is in the UR for JA speakers comes from these words’ derivatives. For instance, the plural form for [kæs] is [kuʔus] “trophies” and not *[kuus], whereas the active principle form for [ræs] is [raʔis] “a head” and not *[raais], while the past tense for [jækul] is [ʔakal] “he ate,” and [ʔaba] “he refused” for [jæba].

A similar pattern to that in (34) is also found by Alqahtani (2014) in Najdi Arabic (spoken in the central region of Saudi Arabia) in (36). He attributed the non-occurrence of the vowel and the glottal stop deletion to the same reason that I propose for JA.

36) Word-Initial Glottal Stop (Najdi Arabic)

a. /ʔakil/ [ʔakil] “food”

b. /ʔamarna/ [ʔamarna] “we ordered”

The same pattern is found in Najdi Arabic, as shown in (37), adopted from Alqahtani (2014:10).

37) Word-Medial Glottal Stop (Najdi Arabic)

a. /raʔs/ [ra:s] “a head”

b. /ðiʔb/ [ði:b] “wolf”

Deletion of the glottal stop in medial position is likewise found in the Meccan dialect of Saudi Arabic. According to Abu-Mansour (1987), this deletion involves compensatory lengthening of the vowel stem, as shown in (38), adopted from Abu-Mansour (1987, p. 264).

38) Word-Medial Glottal Stop (Meccan Arabic)

a. /ʔa-ʔkul/	[ʔa:kul]	"I eat"
b. /na-ʔkul/	[na:kul]	"we eat"
c. /ja-ʔkul/	[ya:kul]	"he eats"

However, there are different instances of glottal stop and vowel deletion that occur in different patterns, where the notion of whether the glottal stop is in the underlying representation or is epenthetic is debatable and thus relevant to the current study. These patterns are found in the imperative verb forms.

2.4.1.1 Glottal Stop in Verbs

In the literature, it is assumed that the underlying representation of the imperative form in Arabic is /CCVC/. However, the word-initial consonant sequences are avoided by a prothetic vowel, such as [i], and because Arabic does not allow an onsetless syllable, a glottal stop /ʔ/ is inserted before the vowel. For example, if the underlying structure is /fʕal/, and then the vowel is inserted, the result is *[ifʕal]. However, this structure is ill-formed and needs further modification; thus, the glottal stop is inserted, resulting in [ʔifʕal] (Abboud, 1979; Alqahtani, 2014; Haddad, 2005; McCarthy & Prince, 1990; Watson, 2002).

Therefore, it is important to determine the input for the imperative verbs in JA before making assumptions or analyzing data. I claim that the imperative forms are derived from an input with no vowel or glottal stop in JA. In other words, the glottal stop and vowel insertion are attributed to the underlying consonant sequences of the input. However, as mentioned above, there

are variations in the output of JA varieties, so the glottal stop and vowel insertion applies to most, but not all, varieties of JA. For instance, the output for these imperative verbs differs in all Jazani varieties, where word-initial sequences are broken up with a prothetic vowel and glottal stop, from that for the Samti variety of JA. Therefore, in the following discussion, I will distinguish the two outputs, Output I for all JA varieties and Output II for the Samti variety of JA. The examples in (39) illustrate glottal stop and vowel patterns in imperative verbs in JA.

39) The imperative verb form (JA)

	Input	Output I	Output II	Gloss
a.	/ʃrab/	[ʔaʃrab]	[ʃrab]	“drink!”
b.	/drʊs/	[ʔadrʊs]	[drʊs]	“study!”
c.	/ktʊb/	[ʔaktʊb]	[ktʊb]	“write!”

Output I, where word-initial clusters are broken up with a prothetic vowel and glottal stop, is a pattern similar to that of Classical, Meccan, and Najdi Arabic, whereas Output II, which exhibits word-initial consonant sequences is a pattern similar to that of Yemeni Arabic. I briefly present these similar patterns in CA and different varieties of Arabic below.

Haddad’s (2005) study of CA similarly attributed the insertion of the vowel and glottal stop to the biconsonantal cluster attested in the input. He considered the examples in (40).

40) The imperative verb form (CA)

a.	/ʃrab/	[ʔiʃ.rab]	“drink!”
b.	/drus/	[ʔud.rus]	“study!”
c.	/ktub/	[ʔuk.tub]	“write!”

In his observation of the Najdi dialect, Abboud (1979) similarly claimed the imperative forms are derived from an input with no vowel or glottal stop, as seen in (41), adopted from Abboud (1979).

41) The imperative verb form (Najdi dialect)

a. /skin/	[ʔiskin]	"dwell!"
b. /gtˤaʕ/	[ʔigtˤaʕ]	"cut!"
c. /hʤim/	[ʔihʤim]	"attack!"

Along the same lines, Rakhieh (2009) discussed the imperative form of Ma'ani Arabic, a variety of Jordanian Arabic. Regardless of the input, he claimed imperative forms were derived from the imperfective, but he agrees that they surface with glottal stop and vowel as exemplified in (42).

42) The imperative verb form (Ma'ani Arabic)

Imperfective	Gloss	Imperative	Gloss
a. ji-ftaħ	"he opens"	ʔi-ftaħ	"open!"
b. ju-drus	"he studies"	ʔu-drus	"study!"
c. ji-ʃrab	"he drinks"	ʔi-ʃrab	"drink!"

So far, we have only seen varieties that correspond with JA output I. There seems to be a paucity of varieties with output II. Nevertheless, such output is found in the Central Yamani Tihāmah Arabic (CT), spoken in the city of al-Hudaydah in Yemen.

Greenman (1979) briefly mentioned that the Central Yamani Tihāmah Arabic allows initial consonant clusters (p. 57). Such clusters/sequences align with JA output II, which are result of glottal stop and vowel deletion, as illustrated in (43).

43) The imperative verb form (CT)

	MSA	CT	
a.	/ʔidʒlis/	[dʒlɪs]	“sit down!”
b.	/ʔuktub/	[ktub]	“write!”

Along the same lines, Prochazka (1987) examined some of the salient features in the North Yemeni Arabic, spoken in Zabid (p. 60). He discussed the imperfect and the imperative form, illustrating the occurrence of word-initial consonant sequences, as in (44).

44) The imperative verb form (North Yemeni Arabic)

	Imperfective	Gloss	Imperative	Gloss
a.	ta-ktub	“you write m.s.”	ktub	“write! m.s.”
b.	ta-ktubi	“you write f.s.”	ktubi	“write! f.s.”
c.	ta-ktubu	“you write c.pl.”	ktubu	“write! c.pl.”

Yet, based on the observation above, someone could conclude that such patterns are only found and common in the varieties spoken in the southern corner of the Arabian Peninsula. However, other varieties such as Moroccan Arabic spoken in the north west of Africa also exhibit word-initial consonant sequences, but for a different form, namely the past tense verbs, as shown in (45), adopted from Boudlal (2006, p. 24).

45) Past tense verb form (Moroccan Arabic)

a.	ktb	[ktəb]	“he wrote”
b.	ðˤrˤb	[ðˤrˤəb]	“he hit”

Another piece of evidence, comes from the collected data and my observation for hollow verbs as in (46a-b)—verbs that have two consonants and a long vowel in the middle, and doubled verbs as in (46c-d)—verbs that have three consonants and a short vowel in the middle where the

second and the third consonants are identical “geminate”— which surface with no glottal stop and a vowel in the imperative form, implying the glottal stop and vowel are not underlying forms and are only inserted when there are consonant clusters in the input that need to be avoided. Consider the examples in (46).

46) Hollow and doubled verbs (JA)

Input	Output	Ill-Formed	Gloss
a. /dur/	[dur]	*[ʔidur]	“turn around”
b. /sˤid/	[sˤid]	*[ʔisˤid]	“hunt!”
c. /tˤʊff/	[tˤʊff]	*[ʔitˤʊf]	“jump!”
d. /ʕɪss/	[ʕɪss]	*[ʔiʕɪs]	“touch!”

Similarly, Rakhieh (2009) argued that hollow and doubled verbs in Ma'ani Arabic surface with no glottal stop and a vowel, indicating that the glottal stop and vowel are not in the underlying representation, rather, they are only inserted to break up consonant clusters in the input. Consider the examples in (47), adopted from Rakhieh (2009, p. 147).

47) Hallow and doubled verbs (Ma'ani Arabic)

Input	Output	Ill-Formed	Gloss
a. /guul/	[guul]	*[ʔiguul]	“say!”
b. /ʃidd/	[ʃidd]	*[ʔiʃidd]	“pull!”

Another piece of evidence that the glottal stop and vowel are inserted rather than in the underlying representation, comes from JA perfective forms that have word-initial consonant sequences. These perfective verbs are triliteral verbs that have three radical letters, derived from roots such as g-ħ-f, d-f- ʕ, ħ--r-g, and s-r-g. Consider the following examples in (48) for all JA and the Samti variety.

48) Perfective form (JA)

Input	Output I	Output II	Gloss
a. / ngaħaf /	[ʔanghaħaf]	[ngaħaf]	“got broken”
b. /ndafaʕ/	[ʔandafaʕ]	[ndafaʕ]	“got paid”
c. /nħarag/	[ʔanħarag]	[nħarag]	“got burned”
d. /nsarag/	[ʔansarag]	[nsarag]	“got stolen”

Likewise, such patterns were discussed by McCarthy (1981), in his study on MSA. He used triliteral verbs in MSA to prove that glottal stop and vowel are epenthetic, showing that the perfective forms that have an onset consonant cluster are repaired with the glottal stop and vowel insertion. For instance, the inputs /nkatab/, and /staktab/ are derived from the root k-t-b, with n-, and st- as the affixal roots. Consider the examples in (49), adapted from McCarthy (1981).

49) Perfective form (MSA)

a. /nkatab/	[ʔinkatab]	“subscribe”
b. /staktab/	[ʔistaktib]	“make write”

Along the same lines, the perfective active forms in the urban Hijazi dialect were noted by Al-Mohanna (1998) and in the northern Najdi dialect by Abboud (1979), where inputs such as /nkisar/ and /nkatab/ surface as [ʔinkisar] “got broken” and [ʔin.ka.tab] “got written.”

To summarize, in this section, I provided pieces of evidence from JA and other Arabic varieties that glottal stop and vowel are epenthetic and are only inserted when needed be, to fix word-initial consonant sequences. This is true for all JA varieties except for Samti. The latter output does not require glottal stop and vowel insertion, rather the output corresponds to the input, a pattern similar to that of Yemeni and Moroccan Arabic. In the following section, I turn to discuss different forms with patterns similar to that of the imperative form explained above.

2.4.1.2 Glottal Stop in Nouns and Adjectives

While there seems to be an extensive literature on the imperative forms, less is known about the glottal stop and vowel in nouns and adjectives. Regardless of the input, JA, namely Samti variety, exhibits word-initial consonant sequences in nouns, as in (50), and adjectives, as in (51), just as was the case with the imperative forms, while such nouns and adjective surface with glottal stop and vowel in other JA varieties.

50) Glottal stop and vowel in nouns (JA)

	Output I	Output II	Gloss
a.	[ʔaħmad]	[ħmad]	"Ahmed"
b.	[ʔabkar]	[bkar]	"Abkar"
c.	[ʔamdʒad]	[mdʒad]	"Amjad"

51) Glottal stop and vowel in adjectives (JA)

	Output I	Output II	Gloss
a.	[ʔaxmaʕ]	[xmaʕ]	"stupid"
b.	[ʔabjaðˤ]	[bjaðˤ]	"white"
c.	[ʔaswad]	[swad]	"black"
d.	[ʔasˤfar]	[sˤfar]	"yellow"

Similar to the patterns in (51), adjectives with word-initial consonant sequences were also observed by Boudlal (2001) in Moroccan Arabic (p. 44), as shown in (52).

52) Word-initial consonant sequences in adjectives (Moroccan Arabic)

a.	bˤjðˤ	[bˤjəðˤ]	"white"
b.	sˤfrˤ	[sˤfərˤ]	"yellow"

To sum up, all of the observed patterns, from the imperative verb, nouns, to the adjectives in JA and their two outputs are attested in other varieties of Arabic. Although there are more Arabic

dialects that show these patterns with glottal stop and vowel insertion, there are only a few varieties that seem to exhibit these forms with word-initial consonant clusters. Regardless of the input, in the next section, I discuss word-initial consonant sequences with respect to the Sonority Sequencing Principle.

2.4.2 Word-Initial Consonant Sequences in JA

As mentioned above, Jazani allows word-initial, medial, and final consonant sequences. Word-initial consonant sequences occur due to speakers' tendency to delete the glottal stop and the following vowel in casual speech. To illustrate, the personal name, color term, and imperative verb in (53) are realized in JA without the initial glottal stop and vowel, resulting in word-initial consonant sequences[9].

53)

a. [hmad] "Ahmad (proper name)"

b. [zrag] "blue"

c. [xrʊdʒ] "get out"

The same words in (53) retain the initial glottal stop and vowel in CA and MSA, as [ʔaħmad], [ʔazraq], [ʔʊɣrʊdʒ].

An important concept regarding word-initial sequences is the sonority sequencing principle (SSP), which restricts the sequence of segments in a syllable (Clements, 1988; Elisabeth Selkirk, 1982). According to the SSP, consonants that are more sonorous appear closer to the vowel, while less sonorous consonants appear farther away from the vowel. The SSP requires the syllable to have only one segment that functions as the peak—the most sonorous segment—of the syllable,

[9] These are realizations of informal and casual speech, which are the focus of this dissertation.

followed and preceded by a segment with lower sonority (Dressler, 1992). In other words, if there are two consonants in the onset, the first consonant should be lower in sonority than the second, meaning the cluster shows an increase in sonority (Clements, 1988; Selkirk, 1982). The SSP scale is represented in (54), where < means "less sonorous than."

54) SSP Scale: stops < fricatives < nasals < liquids < glides < vowels

However, languages like English do not conform to the SSP in all cases. For example, English allows rising sonority clusters like [smæk] "smack" which obeys SSP, but also allows falling sonority clusters like [skul] "school" which violates SSP. Initially, JA seems to not conform to the SSP, as some word-initial consonant sequences in JA appear to conform, while others appear to violate the SSP. For example, JA shows word-initial consonant sequences with rising sonority that follow the SSP scale, as in (55). However, JA also shows word-initial consonant sequences with falling and equal sonority that don't follow the SSP scale, as in (56) and (57). However, as I will show in Chapter 3, such sequences are simplex onsets, which means that these consonants are parsed into separate onsets; thus, they don't form an onset of the same syllable and therefore they don't violate the SSP. Therefore, I introduce and use the term "quasi-" to distinguish between "quasi-rising sonority" and rising sonority sequences.

In the word [smaʕ] "listen" in (55), the first consonant /s/ is a fricative and therefore less sonorous than the second consonant /m/, showing that JA exhibits word-initial sequences that conform to the SSP. In (56a-b), the first consonants in [bkar] and [gtˁaʕ] are /b/ and /g/, respectively, which are stops, and the second consonants are /k/ and /tˁ/, also stops, which on the SSP scale are the least sonorous category. In (56c-d), the equal-sonority sequences have fricatives as the first and second consonants. In (56e), the sequence illustrates an equal sonority with nasals, which seems to violate the SSP.

55) Quasi-rising-sonority word-initial sequences (JA)

a. [smaʕ] “listen!”

b. [ðˁrab] “beat!”

c. [ʃrab] “drink!”

d. [swad] “black”

e. [ksır] “break!”

56) Quasi-equal-sonority word-initial sequences (JA)

a. [bkar] “Abkar (proper name)”

b. [gtˁaʕ] “cut!”

c. [sˁfar] “yellow”

d. [sħab] “pull”

e. [mnaʕ] “forbid/prevent”

57) Quasi-falling-sonority word-initial sequences (JA)

a. [rkab] “get on!”

b. [rsʊm] “draw!”

c. [nzıl] “get off!”

d. [msak] “hold!”

e. [xðˁar] “green”

f. [ftaħ] “open!”

The first consonant in these words is more sonorous than the second. For instance, in the word [rkab] in (57a-b), the liquid /r/ is more sonorous than the stop /k/, whereas in [nzıl] in (57c-d), the nasal /n/ is more sonorous than the fricative /z/. In (57e-f), the first consonants /x/ and /f/ are fricatives and so are more sonorous than the stops /ðˁ/ and /t/.

Although the dissertation focuses on word-initial consonant sequences, it is important to overview word-final consonant sequences in JA, in order to be able to compare the observed patterns with that found in Moroccan Arabic. As mentioned briefly above, JA allows word-final consonant sequences. Regardless of the syllabification, I'll continue to state that JA allows (Quasi) rising, falling, and equal sonority profiles. Consider the following examples in (58), 59), and (60).

58) Quasi-rising-sonority word-final sequences (JA)

a. [rasm] "drawing"

b. [radʒm] "throwing"

59) Quasi-equal-sonority word-final sequences (JA)

a. [rafs] "kicking"

b. [gafz] "jumping"

60) Quasi-falling-sonority word-final sequences (JA)

a. [ðˁarb] "hitting"

b. [ʃʊrb] "drinking water"

The examples above show the different possible combination of word-final consonant sequences in JA. All of these words are nouns with CVCC template which can have verbs on the CCVC template. Therefore, the word in (58a) can have an imperative verb as [rsʊm] "draw!" and (59b) can have an imperative verb as [gfaz] "jump!" and (60b) can also have a verb as [ʃrab] "drink!" These patterns are consistent to data from Moroccan Arabic, discussed in Chapter 3.

To summarize, JA allows word-initial consonant sequences that result from deleting an initial glottal stop and the following vowel. In terms of the SSP, JA seems to exhibit rising, equal, and falling sonority clusters. However, word-initial sequences are not part of the same syllable or onset, as the first consonant maybe extrasyllabic and can be resyllabified and be part of the

preceding word. If it turns out that word-initial clusters are syllabified separately (simplex organization), there would be no violation of the SSP in JA. In contrast, if the word-initial clusters are indeed syllabified as part of the onset, such onsets would violate the SSP. Chapter 3 discusses the approach used in this study to determine the syllabic organization of these clusters according to data collected from JA.

To sum up, in this chapter we have tapped on the consonant and vowel phonemes of JA and discussed some of their allophones. We also introduced the syllable structure of JA and focused on word-initial consonant sequences in JA. Now that we have discovered the different varieties of these word-initial consonant sequences, we are left with the question whether they are simplex or complex onsets. To address this question, Chapter 3 will account for the syllabic organization of these word-initial consonant sequences in JA.

CHAPTER 3. TESTING SYLLABIC ORGANIZATION

3.1 Introduction

Traditional/Theoretical phonological analyses of word-initial consonant sequences which have relied on descriptive data in non-linear or constraints-based frameworks have sometimes led to unclear accounts of syllabification in languages such as Moroccan Arabic and Jazani Arabic (JA) (Benhallam, 1980; Boudlal, 2001; Hamdi, 2015). This situation requires researchers to find reliable techniques and diagnostics to determine syllabic organization. In this regard, a particularly promising avenue is the observation of a correlation between syllabic organization and the timing of consonants and vowels (Brownian & Goldstein, 1988; Byrd, 1995; Goldstein et al., 2007; Shaw et al., 2011). This chapter expands on the temporal coordination literature by presenting new data from JA and showing the usefulness of acoustic methods of examining temporal interval durations to understand syllabic organization. The chapter first provides an overview of the literature on temporal coordination and ways of testing syllable structure: Section 3.2 presents prior articulatory studies and Section 3.3 presents prior acoustic studies on the temporal coordination and syllable structure of different languages. Sections 3.4.1 and 3.4.2 present two production experiments that were conducted on JA, through which it will be argued that word-initial consonant sequences are simplex onsets.

3.2 Articulatory Studies

3.2.1 American English

In a pioneering study on the temporal organization in English syllables, Browman and Goldstein (1988) analyzed articulatory data from the Tokyo x-ray microbeam database that consisted of sets of nonsense words with shifted word boundaries, such as [splats] and [plats]. They used three landmarks to determine the syllable structure organization in American English.

They measured the duration from the end of the vowel gesture (*anchor*) to three different points in the preceding consonant sequence: (a) the leftmost consonant in the consonant sequence (left-edge), (b) the mean of the midpoints of all the consonants in the consonant sequence (c-center), and (c) the rightmost consonant in the consonant sequence (right-edge). The measurements of these intervals reveal two different kinds of organizations, which they termed: global and local organizations. They found that the c-center to anchor interval duration was the most consistent (least variant) across different numbers of consonants in the syllable onset.

Byrd (1995) conducted another study on American English, using electropalatography (EPG) to test the articulatory timing of sequences of one to four consonants, such as s#, k#, sk#, sks#, and sks#k, creating a coda cluster or a coda cluster with a single consonant as an onset. Data were collected from five speakers from southern and central California, with seven tokens for each sequence. Measurements in this study were parallel to those of Browman and Goldstein (1988). Crucially for this dissertation, Byrd's (1995) results showed (C)C#CVX sequences to have a local stability rather than a global stability pattern, which were associated with sequences like #(C)CCVX. That is, the right-edge of the consonant sequences was the most stable interval in sequences of the form (C)C#CVX, while the c-center of the onset consonant was the most stable interval for sequences of the form #(C)CCVX. This indicates that the consonant sequences in the former form, (C)C#C, are not all part of the same syllable as the vocalic anchor which is in a separate word and syllable, whereas the consonant sequences in the latter form, #(C)CCVX, are part of the same syllable as the vocalic anchor. The author attributed this finding to differences in syllable structure.

3.2.2 Georgian and Tashlhiyt Berber

Along the same lines, Goldstein, Chitoran, and Selkirk (2007) studied the syllable structure of onsets in Georgian and Tashlhiyt Berber, using articulatory data (EMMA) to test the timing of the onset sequences in relation to the vowel. They measured the timing of one, two, or three consonants, such as #r, #kr, and #tskr in Georgian, and #m, #sm, and #tsm in Tashlhiyt Berber, collecting the data from 3 speakers, 2 Georgian, and 1 speaker of Tashlhiyt Berber. Goldstein et al.'s (2007) results showed that Georgian onset sequences exhibit a similar pattern to that of English, namely the *c-center* effect (Browman & Goldstein, 1988), in which the rightmost consonant shifts toward the vowel, making the lag between the consonant and the vowel shorter, indicating that the added consonants from one, two, to three consonants are part of the same syllable as the prevocalic consonant. However, this result was found only with one speaker, while the other speaker showed an epenthetic vowel between the sequences. Regardless of the epenthetic pattern, the bottom line is that onsets in Georgian always showed rightward shift, but not when there was epenthesis. On the contrary, onset sequences in Tashlhiyt Berber behave differently from Georgian and English, exhibiting no rightward shift by the rightmost consonant to the vowel, right-edge effect. Therefore, these consonant sequences in Tashlhiyt Berber are simplex, rather than complex onsets. According to Goldstein et al (2007), a word like /smun/ would be parsed as [s.mun], where the [s] is a coda to the preceding syllable or a syllable on its own. These results consistently go along with Dell and Elmedlaoui (1985) and Ridouane's (2008) proposed syllabification for Tashlhiyt Berber, which claims that Tashlhiyt Berber only allows simplex onsets, and also that consonants can be syllable nuclei on their own.

3.2.3 Moroccan Arabic

The syllabic organization of word-initial consonant sequences in Moroccan Arabic has

been debatable. Benhallam (1980) argued that such sequences are complex onsets, so strings such as /kra/ “rent” and /skru/ “his plowshares” are considered to be one syllable. In contrast, Boudlal (2001) argued they were simplex onsets and suggested the strings were syllabified as [k.ra] and [sk.ru]. This debate is due to the different considerations for the schwa that appears in Moroccan Arabic speech.

To account for the schwa that appears between the second and the third consonant in [ktəb] “write,” Benhallam (1990) proposes a Syllable Structure Assignment Algorithm (SSAA) which has four steps and functions from right to left. Crucially, Benhallam distinguishes the schwa syllabification from the full vowel (i, u, a) syllabification. Therefore, the first step assigns CV to a core syllable, where V is a full vowel. The second step is to build the form CəC from unsyllabified consonants, for instance ktb → k.təb.. The third step requires coda assignment, and the fourth step requires syllabification of stray consonants, e.g. k.təb.t → .ktəbt. Importantly, the second step assures the schwa insertion between the second and the third consonant of the root, and the fourth step adjoins the first consonant to be the onset of the syllable, resulting in a branching onset. However, SSAA cannot account for forms like [dˤərˤb] “hitting,” where the schwa appears between the first and the second consonant, or forms with the second consonants geminate as [həzz] “lift.”

To do so, Boudlal (2001) proposed constraints-based analysis in the OT framework to account for these patterns. Simply put, he distinguishes between a minor syllable (degenerate syllable), which consist of a consonant on its own, and a major syllable, which has schwa or a full vowel as its nucleus. He includes minor syllable constraints in MA grammar to account for the form [b.ka] to be the optimal output and prevent forms like [bka] and [bəka] by setting two constraints: (1) no complex onsets (*COMPLEX), and (2) no insertion (DEP) higher in the constraints. However, when the input is ktb, two outputs are possible, [k.təb] and [kət.b], but only

the former should be the optimal one. He attributes this to syllabification directionality, and so suggests an alignment constraint (ALIGN-R-σ'), which requires alignment of the right edge of the stem with the right edge of the prominent syllable. Boudlal also uses (*Min-σ'), which states that prominent minor syllables are prohibited, and sets it higher to eliminate outputs like [kə't.b] and [kət.b'] which violate (ALIGN-R-σ') and (*Min-σ') respectively, and thus obtain [k.tə'b] as the optimal output. Yet, these constraints do not account for other forms like CəCC, as in [dˤərˤb] and [sədd] which violate (ALIGN-R-σ'). The constraints (ALIGN-R (Vb/Adj, σ')) (Beckman 1998) and (NO-SPLITTING) was proposed and ranked higher than (ALIGN-R-σ') and (DEP) to account for such patterns. For instance, /sdd/Vb has two candidates, [s.dəd] which is eliminated due to the violation of (NO-SPLITTING) and [səd.d], the optimal candidate, which violates lower constraints. In the case of nouns, (ALIGN-R-σ') is active rather than (ALIGN-R (Vb/Adj, σ') beside a sonority constraint which is: *μ ə Stops >> *μ ə Fricatives >> *μ ə Nasals >> *μ ə Liquids >> *μ ə Glides, which derive the optimal candidate of nouns with the pattern CəCC. For instance, the stem /dˤrˤb/N has two candidates, [dˤ.ərˤb] which is eliminated by *μ ə Stops, and [dˤərˤ.b] is the optimal candidate which violates lower constraints, *μ ə Liquids, (ALIGN-R-σ') and DEP.

To end this debate, extending the research into temporal organization and syllable structure, Shaw, Gafos, Hoole, and Zeroual (2009, 2011) studied the interval durations of word-initial consonant sequences in Moroccan Arabic. Shaw et al. (2009, 2011) attempted to tease apart these two syllabic analyses by looking at the interval durations of the relevant consonant sequences using electromagnetic-articulography (EMA). They recruited four Moroccan Arabic speakers to produce nine target words, e.g., /lan/ “to become soft,” /flan/ “someone,” and /kflan/ “nonce,” in the carrier phrase /zibi _ hnaja/ “bring _ here.” They compared the durations between the three crucial points in the consonant sequences (left-edge, c-center, and right-edge) to an *anchor point*

in the following vowel (end of the vowel). They hypothesized that a language with a simplex onset organization, where the consonant sequences do not form a complex onset, should have more stability in the right-edge to anchor duration, while a language with a complex onset organization should have more stability in the c-center to anchor duration, as is true of English. Moroccan Arabic exhibited more stability in the right-edge than in the left-edge or c-center to anchor durations (see Figure 5). This finding suggested that the word-initial consonants in Moroccan Arabic were not all part of a single onset. Data are adopted from Shaw et al. (2011, pp. 468-469) and recreated in R.

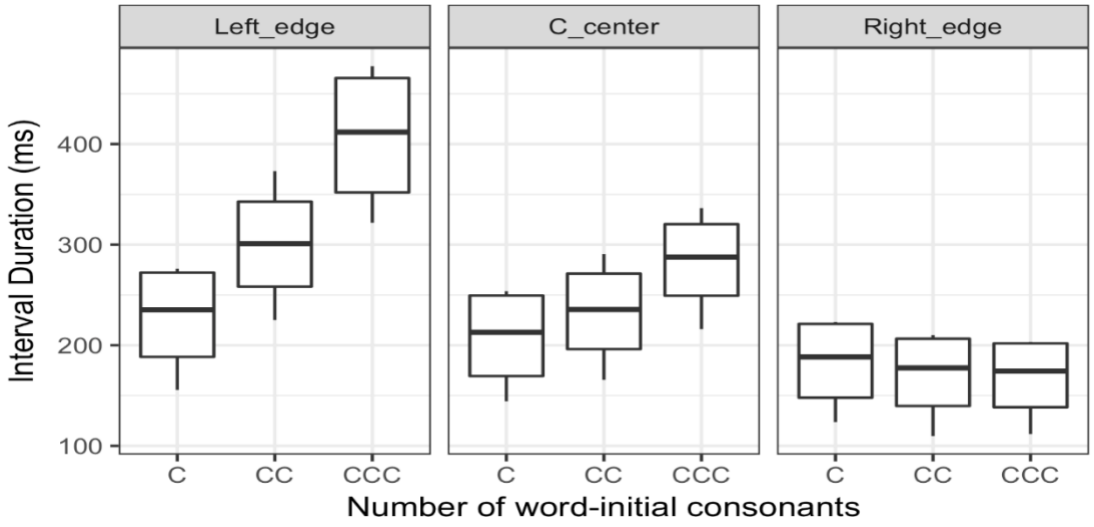


Figure 5. Duration of the left-edge, c-center, and right-edge to anchor intervals across different cluster sizes (C, CC, CCC) for all four Moroccan speakers. Adapted from Shaw et al. (2011, pp. 468-469, Table I).

Figure 6 shows that the right-edge had more stability than left-edge or c-center to anchor intervals, which showed variation across C, CC, and CCC sequences in relation to the interval duration on the y-axis. Shaw et al. (2011) used relative standard deviation (RSD) as an index for the interval stability rather than using indices like variance and standard deviation. RSD is defined as RSD=100*(standard deviation)/(mean).

Using RSD avoids the bias associated with the right-edge being the shortest interval since it is the closest to the vowel. By using the RSD, they found the right-edge had a lower RSD than the left-edge and c-center intervals (Figure 6). Data were created in R from Shaw et al. (2011, pp. 468-469).

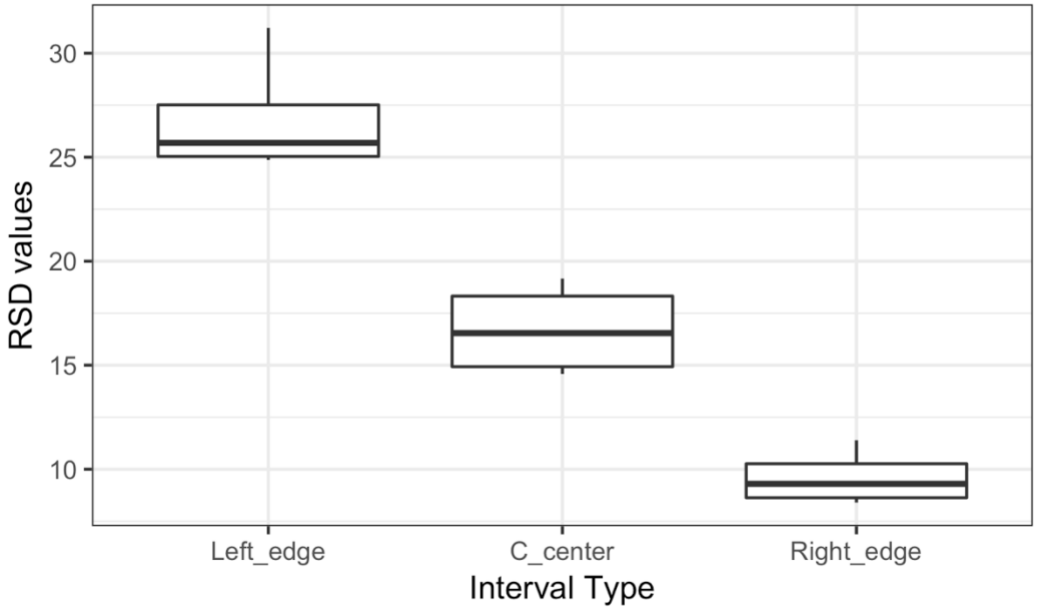


Figure 6. RSD values of the left-edge, c-center, and right-edge to anchor intervals for all four Moroccan speakers. Adapted from Shaw et al. (2011, pp. 468-469, Table I).

3.2.4 Italian

The syllabification of word-initial consonant sequences in Italian has been undetermined and undecidable, especially for clusters that start with a sibilant e.g. /sC/ (Bertinetto, 2004). Although in general it is believed that clusters in Italian are branching (complex) onsets with a tautosyllabic parse, Chierchia (1986), Davis (1990a), Kaye (1992), and McCrary (2004) argued that such clusters are simple onsets with a heterosyllabic parse. Their analysis is based on phonological evidence referred to as *Raddoppiamento-Sintattico* or syntactic doubling (Lepschy & Lepschy, 1977; Marotta, 1986), in which, a gemination of a word initial consonant occurs when preceded by a stressed vowel. This gemination occurs with single consonants, e.g. *città vecchia* →

[tʃitˈtavˈvɛkkja] “old city,” and with consonant sequences of type obstruent-liquid cluster, e.g. *a presto* → [ˈapˈpresto] “see you soon.” However, this pattern is not observed with sibilant clusters, e.g. *città sporca* → [tʃitˈtasˈpɔrka] “filthy city” (Hermes et al., 2013). Such pattern indicates that the sibilant /s/ in the cluster is not in the onset, and so gemination did not apply.

To solve this puzzle, research has shown that temporal coordination can be modulated by the Sonority Sequencing Principle (SSP) (Hermes et al., 2013). In their study, Hermes et al. (2013) used articulatory data from EMA to investigate Italian word-initial consonant sequences with different sonority profiles. Four Italian speakers produced 18 target words, such as /rima/ “rhyme” and /prima/ “first,” repeated 10 times in the carrier phrase *Per favore dimmi la _ di nuovo* “Please, say _ again.” In the results, word-initial consonant sequences with rising sonority (obstruent-liquid sequences, e.g., /pr/) showed c-center stability, suggesting they were complex onsets, as in English. However, word-initial consonant sequences with falling sonority (sibilant-obstruent sequences, e.g., /sp/) showed right-edge stability, suggesting they were simplex onsets, as in Moroccan Arabic and Tashlhiyt Berber.

The studies discussed above involved experiments using an articulatory methodology, including X-ray, EPG, and EMA, all of which are expensive technologies. A more manageable alternative would be to use acoustic techniques. The subsequent section reviews the first and the only existent study that used acoustic measurements to examine the syllabic organization. Paucity of such studies is attributed to the fact that articulatory technique was the first to be used to study the syllabic organization, therefore, maybe it was considered to be the norm. However, the next reviewed study showed that acoustic measurements can be used to understand the syllabic organization, replicating previous findings from articulatory studies.

3.3 Acoustic Studies

3.3.1 American English

Most, if not all, previous related work employed gestural coordination through articulatory techniques. However, Selkirk and Durvasula (2013) replicated previous results through acoustic measurements by showing that English has more stability in the c-center to anchor interval than in right-edge or left-edge to anchor intervals. They conducted a production experiment in which they recorded acoustic data. Twelve native American English speakers produced 12 repetitions of 16 English words (eight test, eight filler, with a total of 192 items per subject) in the carrier phrase "Say ____ here." The test items consisted of words that varied in the number of onset consonants (C_1, C_1C_2, sC_1C_2) in two different rhyme contexts, e.g., "ram," "cram," "gram," and "scram." The Penn Phonetics Lab Forced Aligner (Yuan & Liberman, 2008) was used to automate identification of phone boundaries, and a Praat script was used to extract relevant measurements. Their results suggested that, as with articulatory measurements, English showed a c-center to anchor stability in acoustic measurements, suggesting that temporal stability due to syllabic affiliation can be reliably tested through acoustic techniques. Their fully automated measurement technique afforded a substantial decrease in the time and cost involved in such research. As shown in Figure 7, the results of the study found c-center to be more stable than the other two intervals, confirming the pattern of English found in previous works by Browman and Goldstein (1988). That is, unlike Moroccan Arabic, English onset clusters behave as complex onsets. The results also suggest the acoustic methods can be effectively used to study temporal coordination.

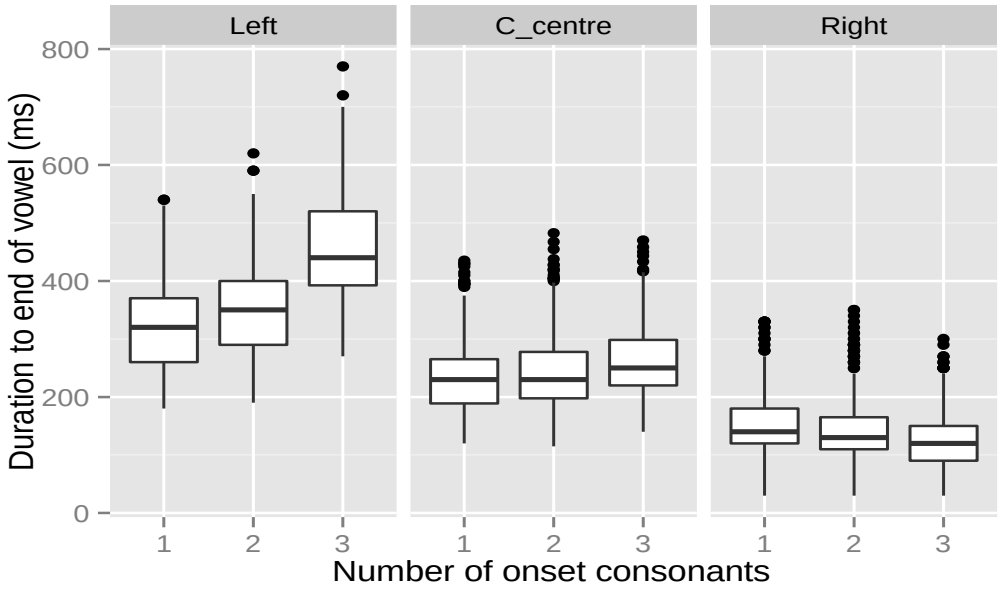


Figure 7. Boxplot of the left-edge, c-center, and right-edge interval durations across six speakers (Selkirk & Durvasula, 2013).

3.4 Jazani Arabic

3.4.1 Experiment 1

Jazani Arabic allows word-initial consonant sequences, as in [ktʊb] "write." This is unlike Classical Arabic, which typically has at most one consonant in word-initial position, as in [ʔuk.tub]. As previously discussed in Chapter 2, in JA, there is a tendency to delete the glottal stop /ʔ/ and the following vowel in word-initial position in imperative verbs (commands), which were the focus of the present study. Initial glottal stops and the following vowel are only deleted in syllable structures of the type CVC.CVC, such as in /ʔɪsmaʕ/ "listen." This deletion results in word-initial clusters of the form CCVC; in this case, /ʔɪsmaʕ/ would become /smaʕ/. These initial clusters either have rising sonority, conforming to the SSP (/smaʕ/), or have a sonority plateau or falling sonority, going against the SSP (/msak/ "catch"). However, it is uncertain how these clusters are organized and whether they behave differently.

3.4.1.1 Research Questions

In the previous limited literature (Hamdi, 2015), word-initial consonant sequences in JA were only described and never analyzed, therefore; the aim of this research is to fill this gap by determining the syllabic organization of word-initial consonant sequences in JA. Therefore, two research questions that guided this experiment are stated below:

1. Do word-initial consonant sequences in Jazani Arabic have a simplex or complex onset syllabic organization?
2. Does the syllabic organization of these word-initial consonant sequences vary with different sonority profiles?

To answer the first question, there was a need to conduct a phonetic analysis similar to those of Shaw et al. (2011) and Selkirk and Durvasula (2013) that looked at the temporal patterns associated with syllabic organization. To answer the second question, there was a need for target words with different sonority profiles to learn whether the syllabic organization differed between word-initial clusters with rising sonority and those with falling sonority. Results have yielded that word-initial consonant sequences with rising, plateau, and falling sonority profiles are simplex onsets in JA.

3.4.1.2 Methodology

The methodology used in this experiment mostly followed that of Shaw et al. (2011), a production task in which the same three intervals—left-edge to anchor, right-edge to anchor, and c-center to anchor—were measured. However, the aim of this study and a key difference with previous studies was the use of acoustic methods following Selkirk and Durvasula (2013) rather than articulatory measurements to determine the interval durations of word-initial consonant clusters in JA.

3.4.1.2.1 Participants

I recruited seven male native speakers of JA between the ages of 30 and 35. All the participants were male speakers because there are social boundaries for Saudi Arabians that prevent men and women to meet with each other individually in an isolated place like a recording room. To fulfill the study requirements and minimize variation, all participants came from the town of Samtah in Jazan Region. Therefore, the production data represent this variety of JA. The data were collected in Jazan, Saudi Arabia, through individual meetings with participants.

3.4.1.2.2 Stimuli

I grouped the 72 target words (32 real, 40 nonce) into 36 pairs and divided them into different categories according to the sonority hierarchy: rising, plateau, and falling sonority. For instance, test words with [sm] consonant sequences, such as [smaʕ] "listen," were categorized as rising sonority; test words with [mn], such as [mnaʕ] "prevent," were categorized as sonority plateau; and test words with [nf], such as [nfax] "blow out," were categorized as falling sonority. The target consonants always consisted of nasals and fricatives. Table *2* and Table *3* present sample subsets of the wordlist that prompted native-speaker productions (see the full wordlist in APPENDIX B). The first set of words consisted of /m/ + fricative, and the second consisted of /n/ + fricative. This was done to ensure the measurements of segment boundaries and subsequent left-edge, c-center, and right-edge to anchor intervals were accurate. That is, annotating the beginning and end of nasals and fricatives in acoustic recordings is easier than doing so for consonants.

Table 2. A sample of words consisting of [m] + consonant (fricative or nasal).

Sonority	Meaning	Transcription	Transcription	Meaning
Rising	Proper name	[ɦmad]	[mad]	Extend
Rising	Hit/stupid	[xmaʕ]	[maʕ]	With
Plateau	Prohibit	[mnaʕ]	[naʕ]	Nonce
Plateau	Nonce	[mnax]	[nax]	Nonce
Falling	Clean	[mɦaʃ]	[ɦaʃ]	Cut
Falling	Nonce	[mɦaz]	[ɦaz]	Nonce

Table 3. A sample of words consisting of [n] + consonant (fricative or nasal).

Sonority	Meaning	Transcription	Transcription	Meaning
Rising	Throttle!	[xnʊg]	[nʊg]	Nonce
Rising	Cook!	[ɦnɪd]	[nɪd]	rivalry
Plateau	Pluck!	[nmʊsˤ]	[mʊsˤ]	Suck
Plateau	Nonce	[nmʊk]	[mʊk]	Nonce
Falling	Get off!	[nzɪl]	[zɪl]	Get in
Falling	Go away!	[nʃʊr]	[ʃʊr]	Consult

3.4.1.2.3 Instruments and Procedures

Each participant was asked to provide the production data individually. The instruments comprised the production task and a demographic questionnaire. The questionnaire elicited information about where they were born and grew up, age, educational status, and the languages they spoke. Acoustic data from the production task were recorded through Audacity 2.0.3 (Audacity, 2015), using a microphone (Logitech USB Desktop Microphone) connected to a Macbook Pro laptop at a sampling rate of 44.1 kHz. Participants sat in a quiet room in front of the

computer while target words were displayed in Standard Arabic script. The instructions were provided in Jazani Arabic to encourage participants to pronounce the words in their own dialect. Participants were given three sentences for practice, which were not used in the analysis. Participants read the test words in the carrier phrase [ʔınta ____ marah θanjah] "You __ again." Every participant produced 468 (78*6) tokens, yielding a total of 3,276 tokens.

3.4.1.3 Data Analysis

3.4.1.3.1 Scripting

Each sound file was manually annotated in Praat (Boersma & Weenink, 2016), and a Praat script was used to automate the measurements of the production data. The annotation marked the segment boundaries of the word-initial consonants and the following vowel. The same definitions used by Shaw et al. (2011) were employed to measure the right-edge, c-center, and left-edge to anchor intervals. For simplicity, in the annotation process, words with special IPA symbols such as /ħ/, /ʕ/, and /ʃ/ were coded with capital letterers such as <H> and <A>, or to two letters <sh>.

3.4.1.3.2 Measurements

Acoustic and spectrographic information (see Figure 8) were used to manually mark the labels mentioned above. For instance, in a word with a consonant sequence like [msak] "catch," the left-edge to anchor interval duration was calculated from the midpoint of the target consonant [m] to the end of the vowel [a]. The duration from the midpoint of the target consonant [s] to the end of the vowel determined the right-edge to anchor interval duration. The c-center interval duration was determined by calculating the duration from the mean of the midpoints of the two consonants to the end of the vowel. However, the measurements of the three intervals were the same for words with a single consonant, such as [sak] (a nonce word). That is, the measurement from the midpoint of the consonant [s] to the end of the vowel determined the *right-edge*, *c-center*,

and *left-edge*.

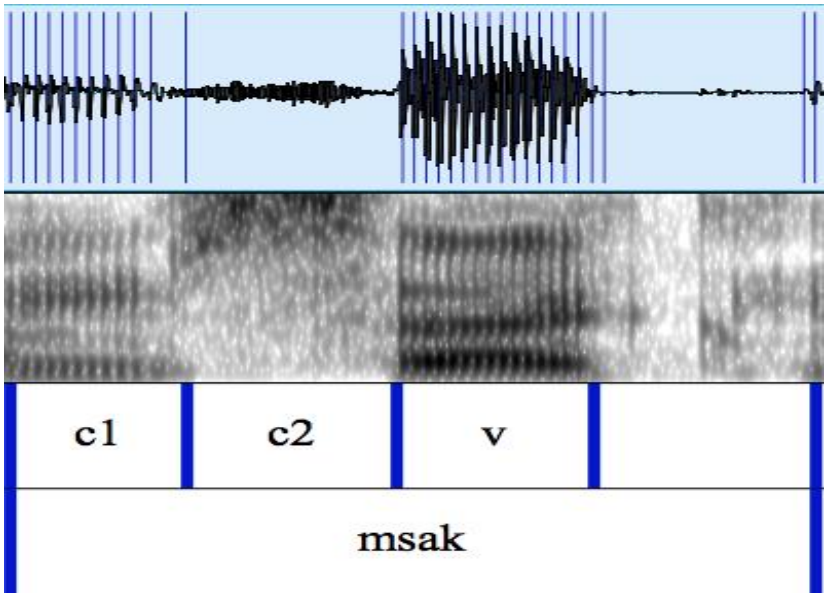


Figure 8. An example token. Durations are measured from the left-edge (midpoint of [m]), right-edge (midpoint of [s]), and c-center (mean of the midpoints of [m] and [s]) to the anchor point, defined as the end of the vowel.

3.4.1.3.3 Method of Analysis

The data were analyzed in R (R Core Team, 2018) using the packages lmer (Bates et al., 2015), and lmerTest (Kuznetsova et al., 2017) to perform linear mixed effect analysis and the package ggplot2 (Wickham, 2009) to present visualizations of the data. First, R was used to process the raw data, and calculate means, standard deviation (SD), and relative standard deviation (RSD) (RSD = 100* Standard deviation / Mean). To obtain RSD values for words, words were coded into pairs; for instance, the words *ħmad* and *mad* were coded as "Hmad ~ mad" to put together their interval values and get the RSDs. Then, visual inspections were plotted and presented along with the previously calculated figures. Further statistical analyses were performed to confirm the interval durations observed for the measurements of the left-edge, c-center, and right-edge intervals.

3.4.1.4 Results and Discussion

3.4.1.4.1 Stability Patterns in Jazani Arabic

The first research question asked whether the syllabic organization of word-initial sequences in Jazani Arabic is a simplex or complex onset. According to the simplex and complex organization hypotheses, if temporal patterns show more stability for the c-center to anchor interval, the word-initial consonant sequences in that language have a complex onset organization. On the other hand, if the temporal patterns show more stability for the right-edge, the language or dialect has a simplex onset organization.

As can be observed in Figure 9, as the number of consonants increases from singleton (#CVX) to biconsonantal (#CCVX), the left-edge and c-center to anchor interval durations change accordingly, while the right-edge to anchor interval duration appears stable.

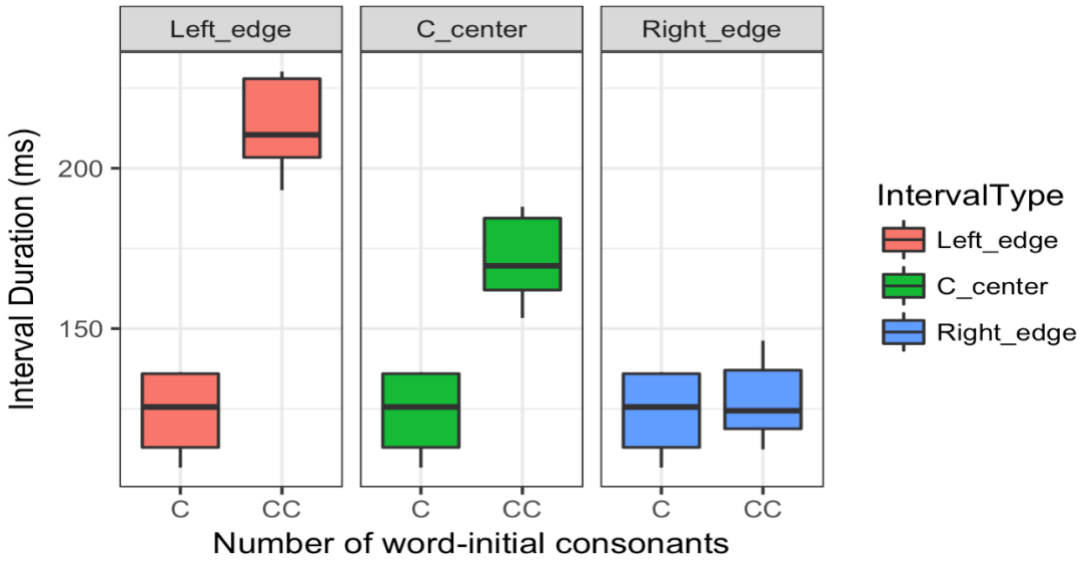


Figure 9. Boxplot of the left-edge, c-center, and right-edge interval durations.

The observed pattern based on raw durations of different intervals above is consistent with the simplex onset organization, in which the right-edge to anchor interval is the most stable interval. To further test which interval was the most stable, I followed Shaw et al. (2011) and used relative

standard deviation (RSD). RSD was used as an index for interval stability rather than variance or standard deviation, since the latter two do not control for how shorter durations (right-edge and c-center) are likely associated with smaller variances. RSD avoids the bias associated with shorter intervals.

Table 4 presents the means, SD, and RSD values for the left-edge, c-center, and right-edge. It shows that the right-edge always had the lowest RSD values (boldfaced), for all tested pairs, compared to the c-center and left-edge intervals which had higher means, SD, and RSD values across all pairs. Results of the RSD were consistent with previous results based on the raw data. RSD values confirmed the right-edge interval was the most stable interval, showing the lowest RSD values. Figure *10* shows the results for all seven participants. The right-edge to anchor interval had the lowest RSD for all seven participants and thus had the most stability.

To evaluate the reliability of the observed pattern, I used R (R Core Team, 2018) and the packages *lmer* (Bates et al., 2015) and *lmerTest* (Kuznetsova et al., 2017) to fit linear mixed effects model to the RSD values. The random effects structure of the model included a random slope of interval type (right-edge vs. c-center vs. left-edge), and included word pair, and participants as random intercepts to account for any variability introduced by any individual speaker producing the test items. The best model obtained through Likelihood Ratio Tests included interval type as a fixed effect (see Table 5). As previously found by visual inspection, the model indicated that right-edge to anchor interval duration had the lowest RSD/estimates, suggesting again that it had the most stability.

Table 4. Three intervals' mean (M), SD, and RSD for pairs differing in the number of initial consonants (singleton vs. biconsonantal) (the lowest RSD values in bold).

Pairs	Left-Edge			C-Center			Right-Edge		
	M	*SD*	*RSD*	*M*	*SD*	*RSD*	*M*	*SD*	*RSD*
fnos~nos	153	52	34	137	37	27	111	19	**17**
dʒmaʕ~maʕ	160	48	30	143	31	22	116	17	**15**
dʒmak~mak	161	49	30	143	32	23	116	18	**16**
ħmad~mad	155	55	35	140	38	27	115	17	**15**
ħmaf~maf	151	52	34	135	35	26	109	18	**17**
ħned~ned	147	53	36	138	39	28	124	27	**22**
ħnef~nef	148	56	38	134	35	26	115	18	**16**
xmaʕ~maʕ	144	52	36	132	36	27	114	18	**16**
xmak~mak	169	51	30	152	35	23	125	19	**15**
xnog~nog	178	48	27	155	28	18	137	21	**16**
xnoz~noz	187	49	26	163	30	18	145	23	**16**
mħaʃ~ħaʃ	189	51	27	162	28	17	143	17	**12**
mħaz~ħaz	180	51	29	156	31	20	136	19	**14**
mxan~xan	157	49	31	141	36	25	120	25	**21**
mxaʃ~xaʃ	142	45	31	126	29	23	105	16	**16**
mnaʕ~naʕ	179	49	27	154	26	17	136	19	**14**
mnax~nax	171	45	26	147	23	15	129	15	**12**
msag~sag	178	51	28	155	29	19	136	19	**14**
msak~sak	170	50	29	147	31	21	130	22	**17**
nfad~fad	191	48	25	165	25	15	148	19	**13**
nfax~fax	190	55	29	165	34	21	146	26	**18**
nħar~ħar	200	50	25	172	30	17	155	25	**16**
nħaθ~ħaθ	183	46	25	156	22	14	138	14	**10**
nxaʕ~xaʕ	146	43	29	129	27	21	109	16	**15**
nxal~xal	150	43	28	134	29	22	113	19	**17**
nmok~mok	199	47	23	173	24	14	157	18	**11**
nmosˤ~mosˤ	185	51	27	161	29	18	143	21	**15**
nʃor~ʃor	164	40	24	146	25	17	126	17	**14**
nʃosˤ~ʃosˤ	167	42	25	149	26	17	129	16	**12**
nzel~zel	143	51	36	132	36	27	113	18	**16**
nzeθ~zeθ	175	51	29	157	34	22	129	16	**13**
ʃnog~nog	145	49	34	136	37	27	122	27	**23**
ʃnol~nol	159	50	31	142	34	24	113	21	**18**
smaʕ~maʕ	122	38	31	118	26	22	113	16	**14**
smaθ~maθ	153	49	32	134	32	24	112	16	**14**
zned~ned	154	48	31	136	31	23	114	16	**14**
znod~nod	153	52	34	137	37	27	111	19	**17**
znotˤ~notˤ	160	48	30	143	31	22	116	17	**15**

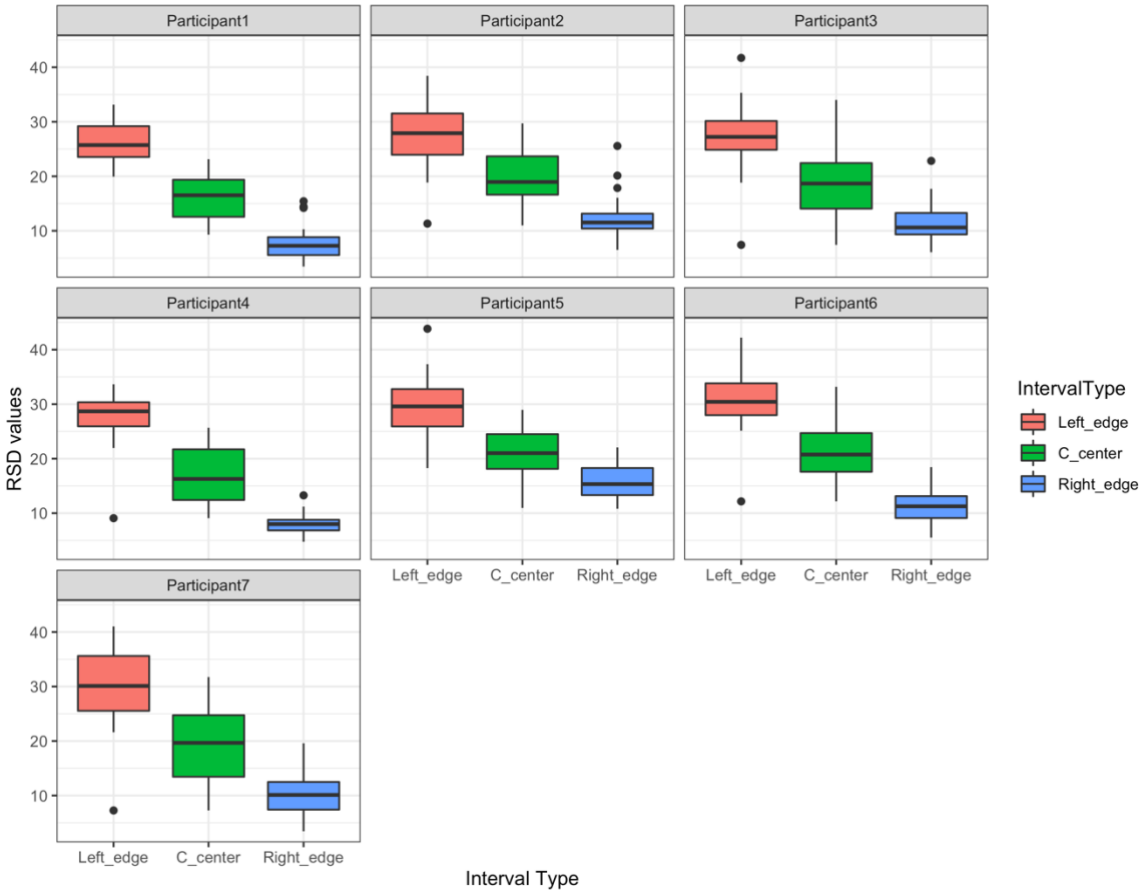


Figure 10. Boxplot of RSD values for the left-edge, c-center, and right-edge intervals across seven speakers.

Table 5. Linear mixed effects model with RSD values as the dependent variable and interval type as the independent variable (baseline: right-edge).

	Estimate	Std. Error	df	*t*-value	Pr(>|t|)
(Intercept)	11	1.07	6.5	10.2	<0.001
C-center	8.2	0.8	13.5	9.4	<0.001
Left-edge	17.7	1.15	9.8	15.4	<0.001

Thus, to answer the first research question, the stability of the interval durations and temporal patterns showed the right-edge to anchor interval to have more stability in Jazani Arabic. This finding indicates JA has a simplex organization for word-initial consonant sequences. That is, the consonants in a word-initial sequence are not all in the same onset but rather are parsed as

C.CVX; e.g., [smaʕ] “listen” is parsed as [s.maʕ]. This study showed a similar pattern and comparable results to those observed in Moroccan Arabic by Shaw et al. (2011). However, the analysis above is collapsed over all sonority profiles. It should be noted that (Hermes et al., 2013) found that Italian word-initial clusters had different syllabic organization based on their different sonority profiles (Section 3.2.4). To control for this possibility, I further analyzed the results according to sonority profiles.

3.4.1.4.2 Stability Patterns and Different Sonority Profiles

To address the second research question, which asked whether Jazani syllabic organization differed depending on the sonority profiles of word-initial consonant sequences, it was necessary to categorize these consonant sequences into groups based on their sonority profiles (rising, plateau, and falling sonority). For instance, test words with [sm] sequences, such as [smaʕ] “listen,” were categorized in the rising sonority category; those with [mn] sequences, such as [mnaʕ] “forbid,” were in the plateau sonority category; and those with [nf] sequences, such as [nfax] *“*blow out,” were in the falling sonority category. Based on these categories, I investigated whether the sonority profiles showed different temporal patterns that could indicate whether some word-initial consonant sequences behaved as simplex and others as complex onsets, as in the case of Italian (Hermes et al., 2013).

Figure 11 shows the RSD values for words with different sonority profiles. The interval types are on the x-axis, the interval duration RSD values are on the y-axis, and a different sonority profile is in each of the facets. Although there are some differences in the three interval types for each sonority profiles, however; the RSD values for the right-edge, c-center, and left-edge to anchor interval durations showed similar patterns across all three sonority profiles. Based on visual inspection, the lowest RSD values appeared to be associated with the right-edge to anchor interval

duration, suggesting initial consonant sequences with different sonority profiles behave similarly.

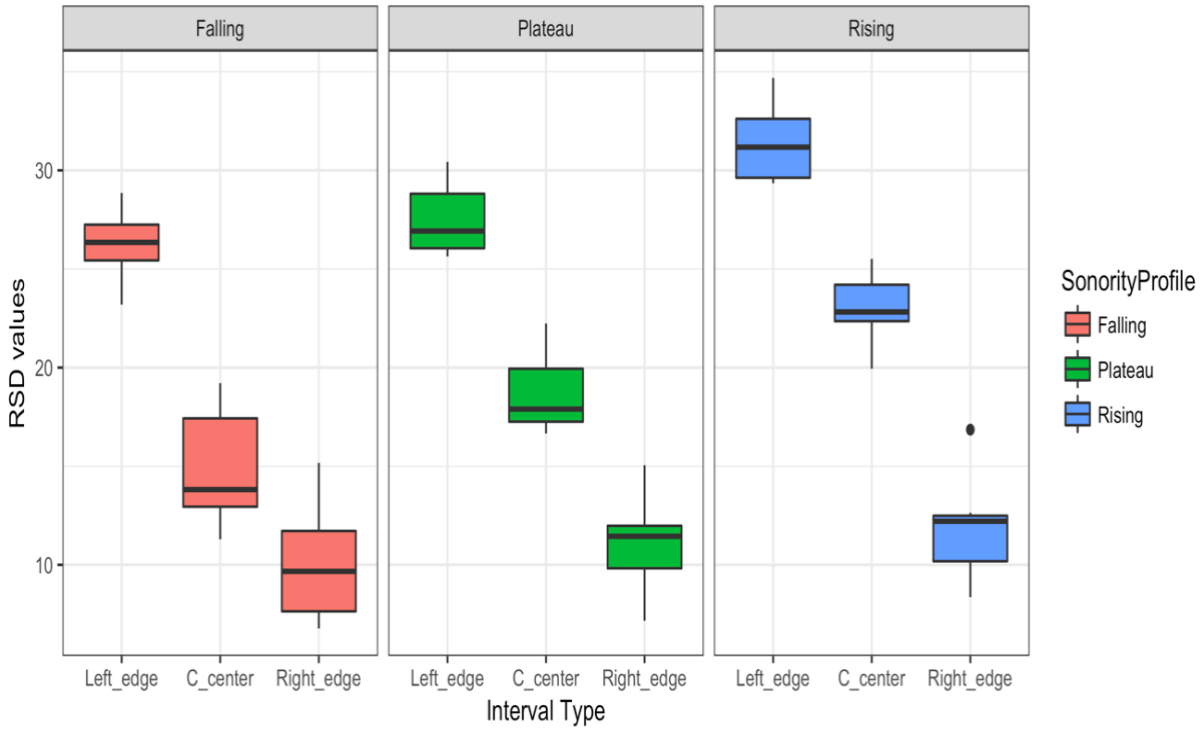


Figure 11. Boxplot of RSD values for the three intervals across the three sonority profiles.

As before, I performed a linear mixed effects analysis, fitting different models to the data. The RSD values were always the dependent variable, whereas sonority profile (plateau vs. falling vs. rising) and interval type were the independent variables. The random effects structure included a random slope of interval type (right-edge vs. c-center vs. left-edge), and random intercepts for word pair and participants. The best model included separate fixed effects of sonority profile and interval type (see Table 6). In line with the RSD values, the model indicated that the minimal RSD values observed previously and associated with the right-edge interval were consistent across all sonority profiles.

Table 6. Linear mixed effects model with RSD values as the dependent variable and interval type and sonority profile as the independent variables (baseline: right-edge, falling sonority).

	Estimate	Std. Error	df	*t*-value	Pr(>|t|)
(Intercept)	9.46	1.1	7.5	8.5	<0.001
C-center	8.16	0.8	13.5	9.4	<0.001
Left-edge	17.7	1.1	9.8	15.4	<0.001
Plateau Sonority	1.49	0.7	36.9	1.9	0.05
Rising Sonority	2.7	0.5	37.1	5.05	<0.001

3.4.1.4.3 Stability Patterns and Word Types

As mentioned in the methodology, the test words included real and nonce words, and the results presented above used the values from both types of words. Since the results for the nonce words may have skewed the values of the real words, it was better either to only plot the results for the real words or to plot both and show them separately. I chose the second option to provide a more nuanced understanding of the two types of words and show any similarities and differences in the temporal patterns. Figure 12 shows the interval durations of the three intervals by their RSD values for the real and nonce words. In addition, Figure 13 and Figure 14 show the RSD values for the three intervals according to the type of word (real or nonce).

The results showed a systematic pattern for real and nonce words. The right-edge, as observed earlier, had the lowest RSD values, while the c-center had higher RSD values than the right-edge, and the left-edge had the highest RSD values. This analysis showed that words, regardless of whether they were real or nonce, displayed a similar pattern. Thus, analyzing both types of words together should not have affected the results in the previous boxplots.

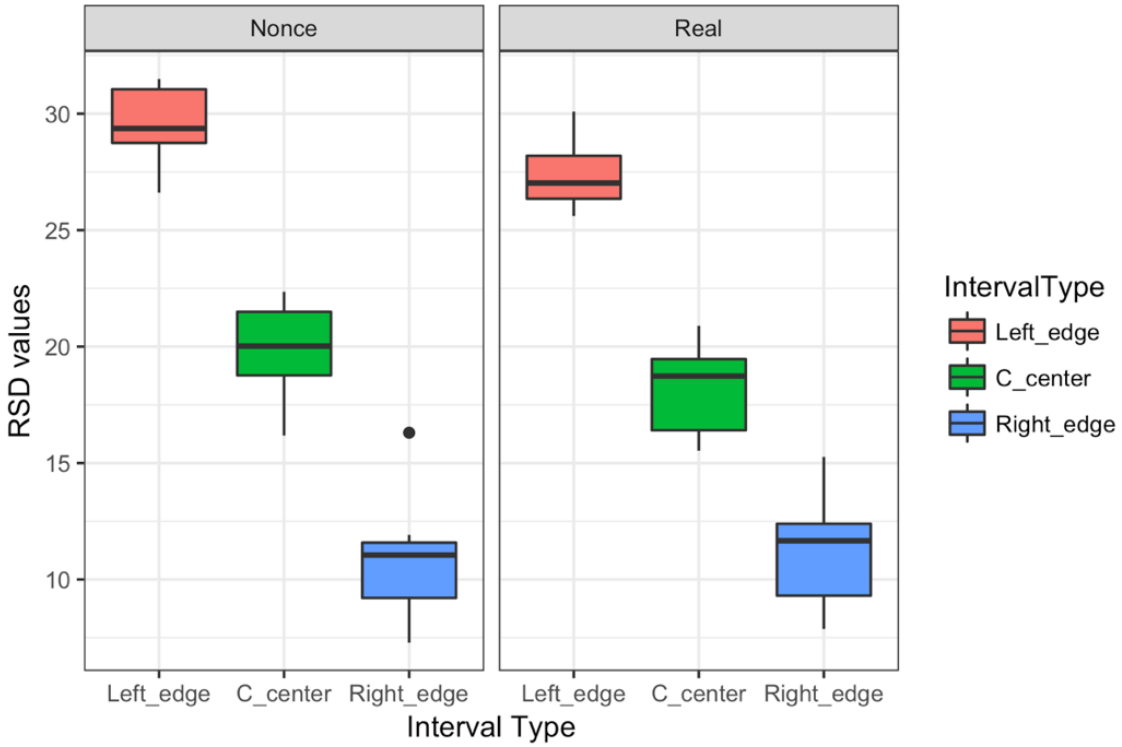


Figure 12. Boxplot of RSD values for real and nonce words across the seven speakers.

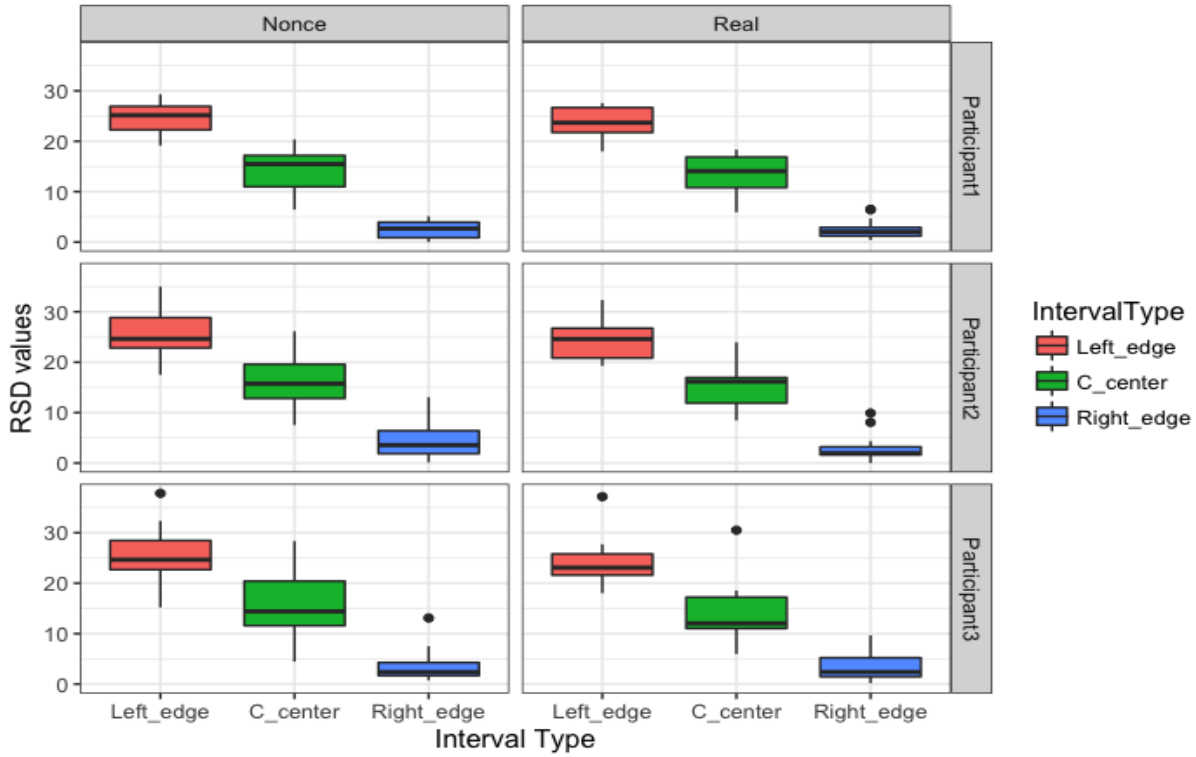


Figure 13. Boxplot of RSD values for real and nonce words for three speakers.

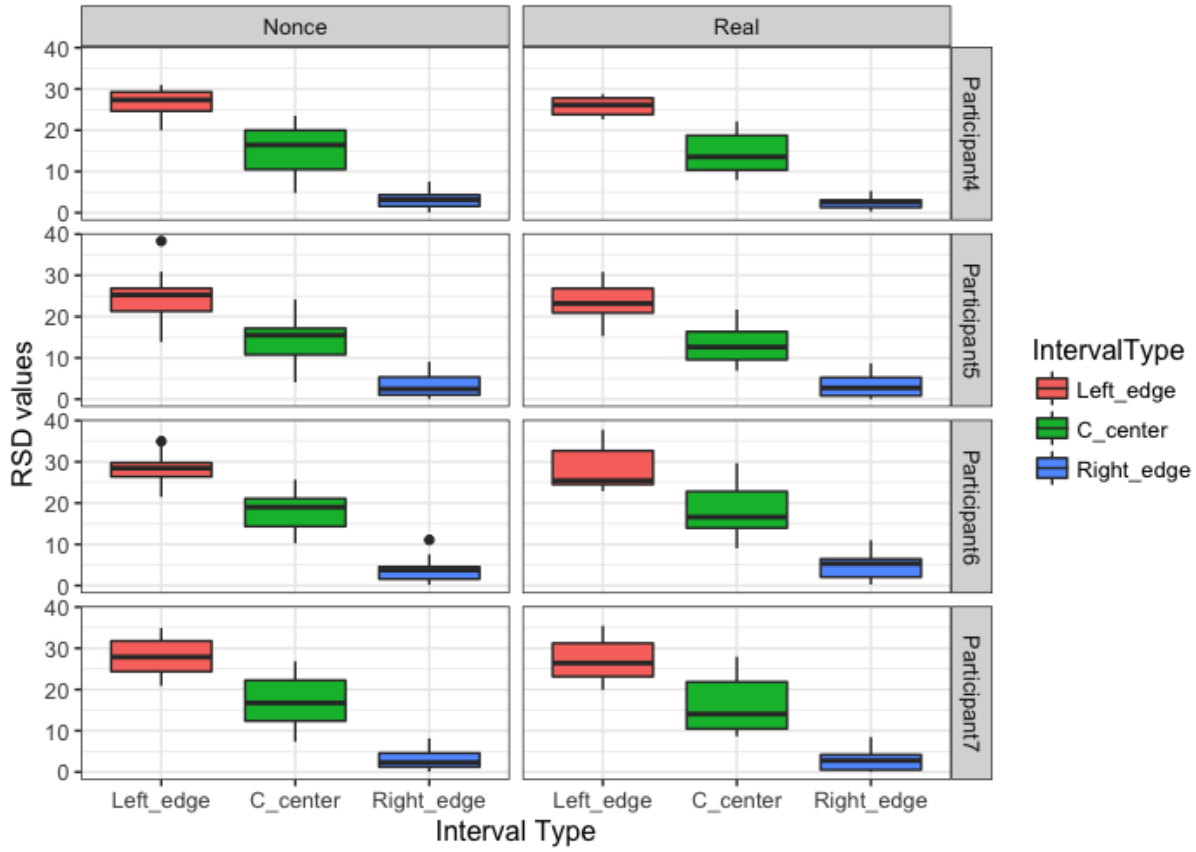


Figure 14. Boxplot of RSD values for real and nonce words for four speakers.

As before, statistical analysis was performed using a linear mixed effects model. The RSD values were the dependent variable, while word type (real vs. nonce) and interval type were the independent variables. The random effects structure included a random slope of interval type (right-edge vs. c-center vs. left-edge), and random intercepts for word pair and participants. The best model included separate fixed effects of word type and interval type (see Table 7). The results of the model were in agreement with those RSD values, indicating that the right-edge interval had the lowest RSD values regardless of word type.

The experiment revealed that Jazani word-initial consonant clusters were simplex rather than complex onsets. That is, the right-edge interval—among all pairs and across all participants, sonority profiles, and word types—had the lowest RSD values and was thus more stable than the left-edge and c-center intervals. This pattern was consistent with the simplex onset organization

hypothesis in Shaw et al.'s (2011) study of Moroccan Arabic. The first experiment revealed that regardless of the sonority profiles and whether the words were real or nonce words, the temporal pattern of JA remained the same, confirming the behavior of word-initial consonant clusters as simplex onsets.

Table 7. Linear mixed effects model with RSD values as the dependent variable and interval type and word type as the independent variables (baseline: right-edge, nonce word).

	Estimate	Std. Error	df	*t*-value	Pr(>|t|)
(Intercept)	10.88	1.1	7.06	9.8	<0.001
C-center	8.20	0.8	16.9	9.2	<0.001
Left-edge	17.7	1.1	11.1	15.3	<0.001
Real	0.30	0.5	53.5	0.5	0.5

This experiment also had limitations from an unexpected dialectal pronunciation of the carrier phrase. The goal of the first experiment was to use /t/ before target words to avoid any doubt about resyllabification of the target and preceding word. However, participants produced [ʔɪnt] "you" as [ʔɪnta], which was unexpected. As noted above, word-initial consonant clusters were found to be simplex onsets. That is, a word like *msak* "catch" was likely parsed as [m.sak], meaning the [m] was not part of the same syllable that included the [s]. As noted in Shaw et al. (2011), some could argue that, since it was not part of the syllable, the first consonant of [m.sak] could be resyllabified as the coda of the previous open syllable in [ʔɪnta] "you." As a result, there is a potential confounding explanation for the right-edge effects in the experiment, the resyllabification of the initial consonant in words such as [msak]. Therefore, in the second experiment, I replicated the procedure of the first experiment but without the carrier phrase, to prevent resyllabification of the initial consonant in words such as [msak].

3.4.2 Experiment 2

3.4.2.1 Research Questions

The purpose of the second experiment was to confirm the results of the first experiment by replicating it with slight changes to the methodology. The second experiment addressed the first research question from the first experiment: Do word-initial consonant clusters in Jazani Arabic have a simplex or complex onset syllabic organization? To avoid repetition, the following sections only present elements of the methodology that differ from the first experiment. The data analysis, scripting, and measurements were the same.

3.4.2.2 Methodology

The second experiment used the same definitions used in Shaw et al. (2011) to determine syllabic organization. This follow-up experiment was also modeled after Selkirk and Durvasula (2013), relying on their acoustic methods to confirm the results of the syllable structure of JA found in (Ruthan et al., 2019). However, this experiment presented the target words in isolation rather than in carrier phrases. This methodology was chosen to prevent the possibility of resyllabification of the initial consonant in some cases to a preceding open syllable.

3.4.2.2.1 Participants

Using an online platform, JotForm (JotForm Team, 2018), I recruited seven different male native speakers of Jazani Arabic between the ages of 30 and 35 from Samtah, Saudi Arabia. All participants were recruited through an e-mail distributed by the author to friends who met the requirements of the experiment.

3.4.2.2.2 Stimuli

The stimuli in the second experiment included only 14 words from the first experiment and two new words. These words contained word-initial clusters with a rising sonority profile. The

results obtained for the rising sonority profile were expected to account for the other two profiles since rising sonority is the permissible form according to SSP for onset clusters. That is, if rising sonority clusters are not found to be part of the same syllable, this should also be the case for the non-SSP-conforming clusters with falling and plateau sonority profiles.

Table 8 and Table 9 present the words recorded by Jazani speakers for the experiment. These words were analyzed separately from the first experiment to confirm the previous results. There were two sets of words: fricative + /m/ and fricative + /n/.

Table 8. A set of words with clusters containing a fricative and [m].

Meaning	Transcript	Transcript	Meaning
Proper name	[ɦmad]	[mad]	Extend
Hit/stupid	[xmaʕ]	[maʕ]	With
Listen	[smaʕ]	[maʕ]	With
Cook	[xmad]	[mad]	Stretch

Table 9. A set of words with clusters containing a fricative and [n].

Meaning	Transcript	Transcript	Meaning
Throttle	[znʊtˤ]	[nʊtˤ]	Jump
Throttle	[xnʊg]	[nʊg]	Nonce
Hang	[ʃnʊg]	[nʊg]	Nonce
Cook	[ɦnɪd]	[nɪd]	Rival

3.4.2.2.3 Instruments and Procedures

The instruments comprised the production task and a demographic questionnaire. Participants were instructed to take part in the study by providing the production data individually in a quiet room. On JotForm, the instructions were provided in Jazani Arabic, using Jazani

morphemes and lexemes, to encourage participants to pronounce the words in their native dialect. Participants were asked to read words containing the target pattern in isolation. They were given three words for practice that were not used in the analysis. To produce higher-quality recordings, participants were asked to use a headset or earphones with a microphone. Every participant produced 96 (16*6) tokens, yielding a total of 672 tokens. After the production task, six sound files for each participant were downloaded, exported from JotForm to Praat, and concatenated to one long file.

3.4.2.3 Results and Discussion

3.4.2.3.1 Stability Patterns in Jazani Arabic

The second experiment sought to confirm the simplex onset findings of the first experiment. Similar to the first experiment, as the number of initial consonants increased from one to two, the left-edge and c-center to anchor interval durations changed with the increase in consonants (#CCVX, #CVX), while the right-edge to anchor interval duration appeared stable (Figure 15).

The observed pattern based on raw durations of different intervals was consistent with the results in the first experiment. As in the first experiment, I used RSD as an index to determine the most stable interval. Table 10 presents the RSD values for all of the pairs across the seven speakers. The right-edge always had the lowest RSD values, whereas the c-center and left-edge intervals had higher RSD values across all pairs. Therefore, the RSD results were consistent with the results based on the raw data for this experiment, confirming that the right-edge interval was the most stable interval by attaining the lowest RSD values. The results also supported earlier findings and the first experiment's assumptions about the temporal patterns and syllabic organization of JA. That is, the results supported the simplex onset organization hypothesis for the syllable structure

of JA, in keeping with the findings of the first experiment.

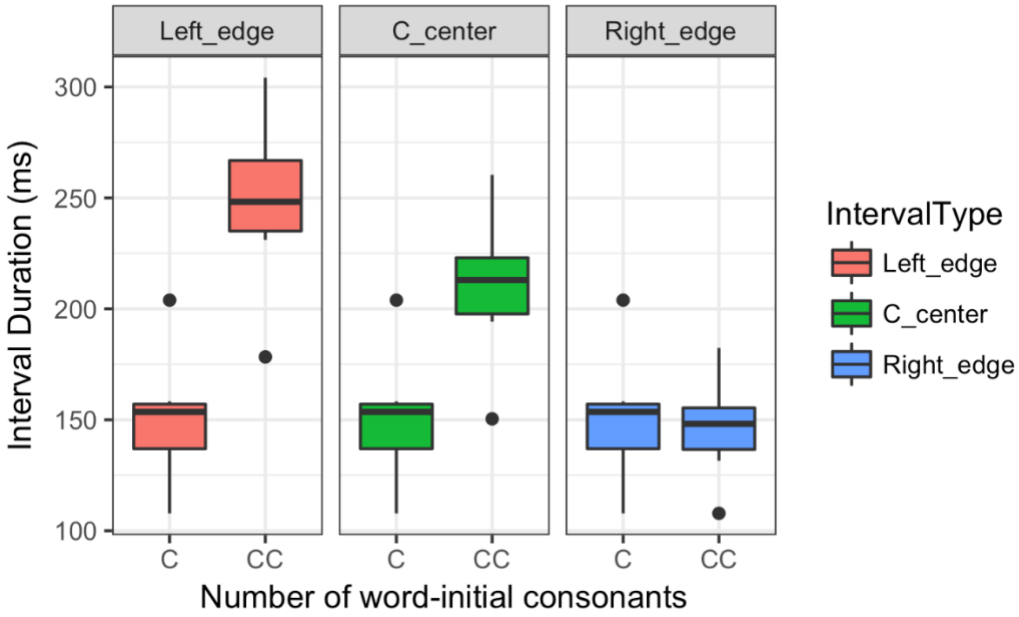


Figure 15. Boxplot of the left-edge, c-center, and right-edge interval durations.

Table 10. The three intervals' RSD values for pairs differing in number of initial consonants (singleton vs. biconsonantal) (the lowest RSD values in bold).

Pairs	Left-Edge			C-Center			Right-Edge		
	M	*SD*	*RSD*	*M*	*SD*	*RSD*	*M*	*SD*	*RSD*
ɦmad - mad	177	62	36	164	46	29	142	28	**20**
ɦnɪd - nɪd	191	59	31	173	43	25	142	27	**19**
ʃnog - nog	182	57	32	170	42	25	146	26	**18**
smaʕ - maʕ	200	69	35	187	57	31	164	46	**28**
xmaʕ - maʕ	200	69	35	187	57	30	166	47	**28**
xmad - mad	174	60	34	162	44	27	140	29	**20**
xnog - nog	149	32	22	148	29	20	148	27	**19**
znotˁ - notˁ	188	53	29	168	36	22	142	21	**15**

Figure 16 shows the results for all seven participants, with the interval types on the x-axis

and their RSD values on the y-axis. Based on a visual inspection, the right-edge to anchor interval had the lowest RSD for all seven participants, meaning this interval had the most stability.

Furthermore, I fitted a linear mixed effects model to the RSD values. The random effects structure included a random slope of interval type (right-edge vs. c-center vs. left-edge) and a random intercept of word pair and participants. The best model included a fixed effect of interval type (see Table 11). As with the visual inspections, the model indicated that right-edge to anchor interval duration had the lowest RSD and thus the most stability.

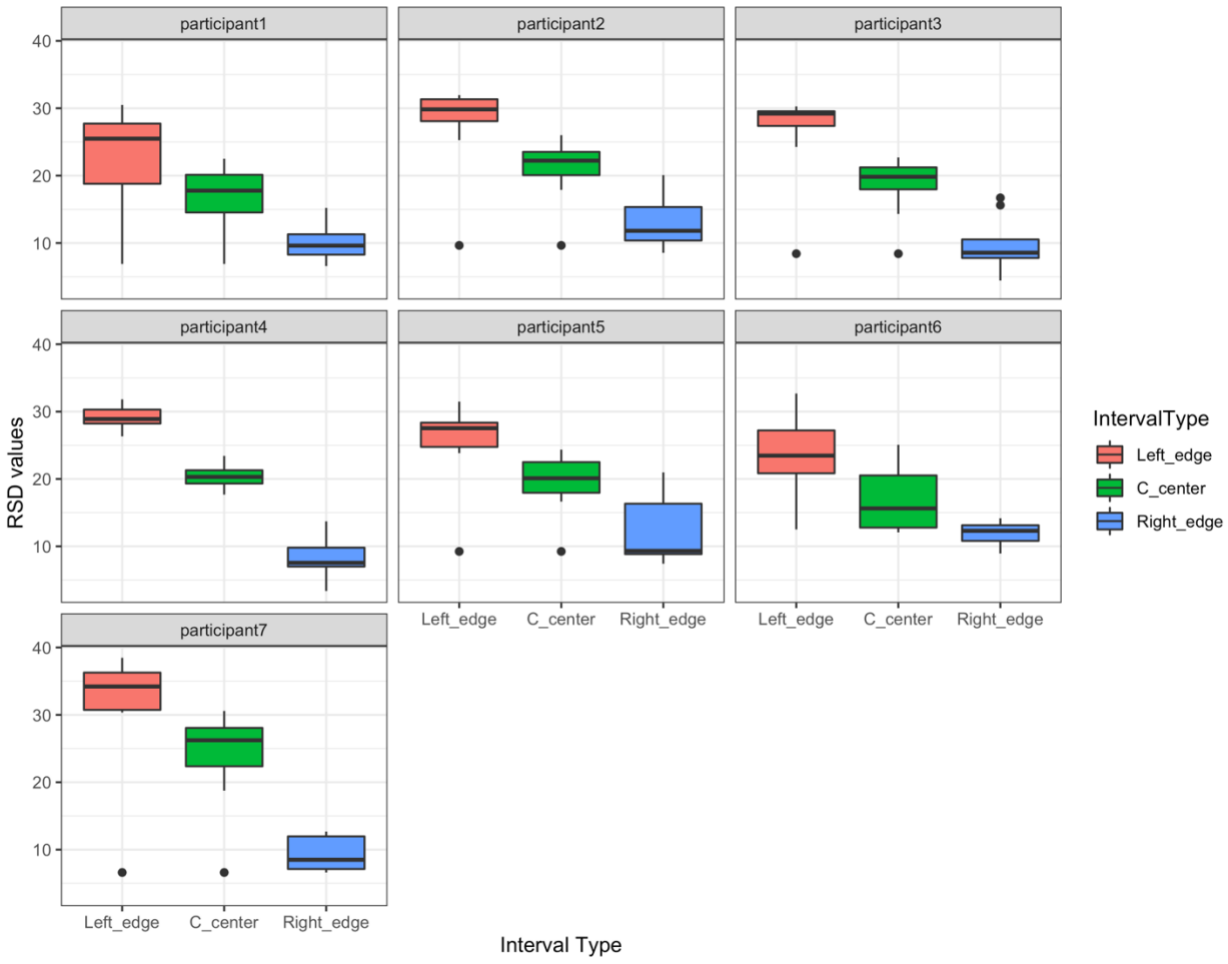


Figure 16. Boxplot of RSD values for the left-edge, c-center, and right-edge interval durations across seven speakers.

Table 11. Linear mixed effects model with RSD values as the dependent variable and interval type as the independent variable (baseline: right-edge).

	Estimate	Std. Error	df	*t*-value	Pr(>|t|)
(Intercept)	10.9	0.9	7.14	11.7	<0.001
C-center	6.4	2.05	7.7	3.1	<0.05
Left-edge	11.6	3.2	7.4	3.5	<0.01

In answer to the research question common to both experiments, the stability of the interval durations suggested that the temporal patterns showed the right-edge to anchor interval to have more stability in Jazani Arabic, indicating Jazani Arabic has a simplex organization for word-initial consonant sequences. As noted before, the consonants in a word-initial sequence are not all in the same onset but are rather parsed as C.CVX; e.g., [smaʕ] "listen" is parsed as [s.maʕ].

3.4.2.3.2 Stability Patterns and Different Sonority Profiles

Since the second experiment only used words with a rising sonority profile, there were no other sonority profiles to compare or analyze, and an overall RSD plot of rising sonority would look the same as Figure 11. However, if the rising sonority profile behaved like a simplex onset, it follows, given the SSP, that falling and plateau sonority would behave as simplex onsets as well, in keeping with the patterns in the first experiment.

3.4.2.3.3 Stability Patterns and Word Types

Test words in the second experiment mostly comprised real words and only a couple of nonce words, unlike the first experiment, which had plateau numbers of both word types. All visual analyses and plots presented above used real and nonce values together. Since the stimuli had more real words than nonce words, it might not be necessary to break down the data in detail, but for the purpose of consistency, Figure *17* illustrates RSD values for real and nonce words separately.

Figure 17 shows the interval durations of the three intervals by their RSD values for the real and nonce words. Nonce words had lower RSD values, ranging from 28 to 7, while real words had values ranging from 22 to 12. This might be attributed to the unbalanced real and nonce words. Nevertheless, the interval durations for both word types showed interval durations consistent with the simplex onset organization, illustrating higher RSD values for left-edge and c-center intervals than for right-edge intervals. Below, the results of the second experiment are compared to those of the first.

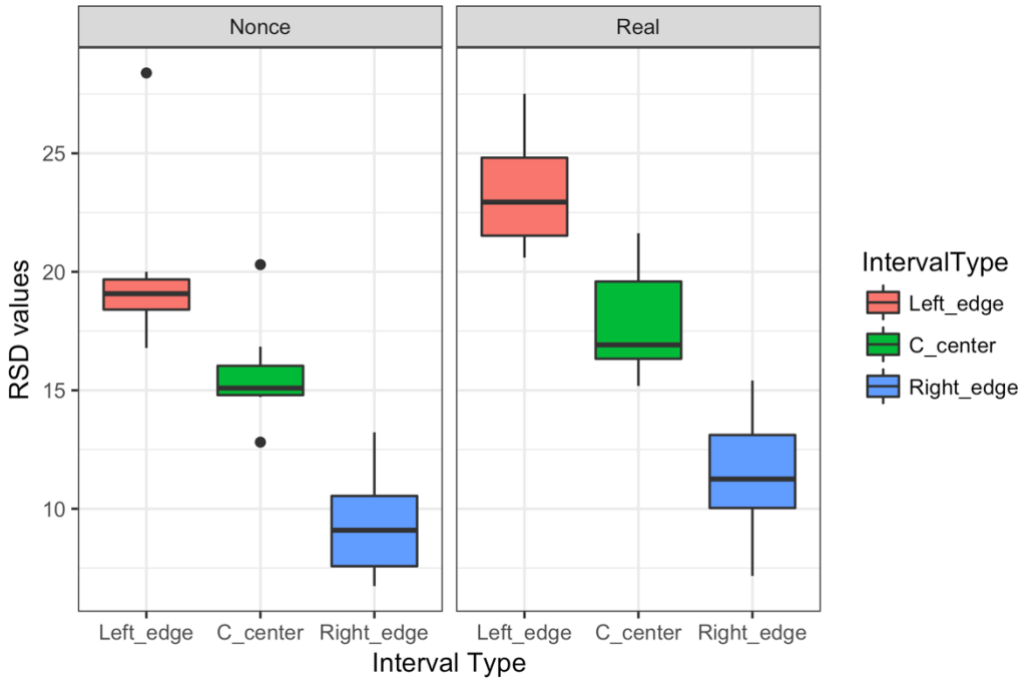


Figure 17. Boxplot of RSD values for real and nonce words across seven speakers.

Figure 18 shows the RSD values for the three intervals according to the type of word (real or nonce) by participant. Although boxplots were not fully shaped due to the small data size, the interval durations still clearly showed the right-edge always had the lowest RSD values for each participant in both word types, the c-center had higher RSD values than the right-edge, and the left-edge had the highest RSD values, showing a systematic pattern for real and nonce words in both experiments.

As before, the reliability of the interval durations was statistically tested by fitting a linear mixed effects model to the RSD values. The model included RSD values as the dependent variable; the independent variables were word type and interval type. The random effects structure included a random slope of Interval type and random intercepts for word pair and participants was included as random effects. The best model included separate fixed effects of word type and interval type (see Table 12). The results of the model were in agreement with those RSD values, indicating that the right-edge interval had the lowest RSD values regardless of word type.

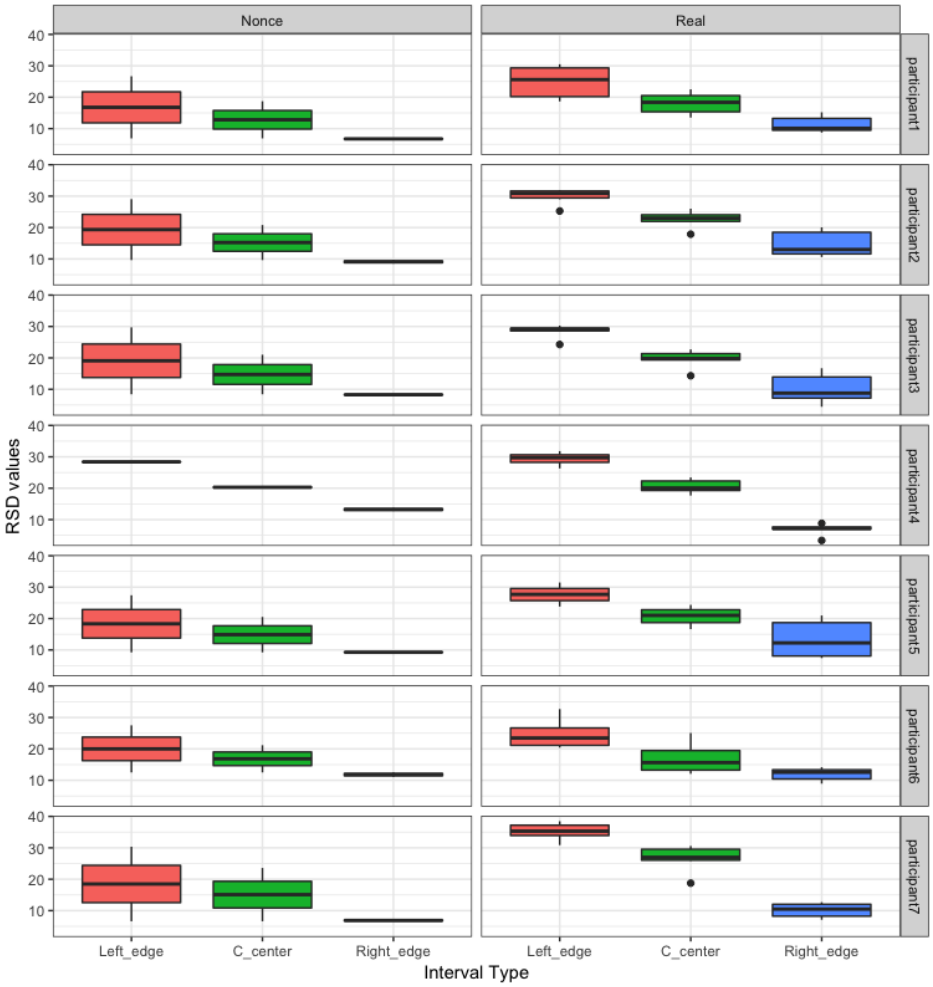


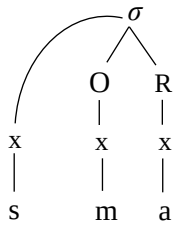
Figure 18. Boxplot of RSD values for real and nonce words for seven speakers.

Table 12. Linear mixed effects model with RSD values as the dependent variable and interval type and word type as the independent variables (baseline: right-edge, nonce word).

	Estimate	Std. Error	df	*t*-value	Pr(>|t|)
(Intercept)	9.3	1.7	7.5	5.2	<0.001
C-center	6.4	2.05	7.8	3.1	<0.05
Left-edge	11.6	3.2	7.5	3.5	<0.01
Real	2.09	1.8	6	1.1	0.3

In Experiment 2, word-initial consonant clusters in Jazani Arabic behaved as simplex rather than complex onsets, confirming the findings of Experiment 1. Visual inspection and statistical analysis indicated that the right-edge interval had the lowest RSD values and estimates in all pairs and across all participants and word types in both experiments and was thus the most stable interval compared to the left-edge and c-center intervals. These results were in accordance with the simplex onset organization hypothesis in Shaw et al.'s (2011) study of Moroccan Arabic and Goldstein et al.'s (2007) study of Tashlhiyt Berber. Experiment 2 provided evidence against the argument that the first consonant of an initial cluster is resyllabified with the preceding word. For instance, the word [smaʕ] "listen" is parsed heterosyllabically as [s.maʕ], meaning the [s] is not part of the same syllable that includes the [m]. While the present study does not argue for a precise affiliation or syllabification of this consonant, it does put forward two possible syllabifications. The consonant could be parsed as an adjunct (Barlow, 2001) outside the syllable onset but linked directly to the syllable node (see Figure 19a) or parsed as an extrasyllabic consonant (Levin, 1985), i.e., syllabified separately and not linked to the syllable node (see Figure 19b).

(a) Adjunct: s.ma



(b) Extrasyllabic: [s]ma

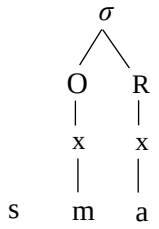


Figure 19. Possible syllabic representations of word-initial clusters in Jazani Arabic.

Although I have made a progress answering the question relating to the syllabification of word-initial consonant sequences in JA, it is difficult to find another phonological evidence to support these results. However, if I have to make a guess, I would rely on my native intuition of the dialect and say that these first consonants in sequences are resyllabified to be the coda of the preceding syllable in connected speech. This assumption is based on my observations of imperative verbs and adjectives when preceded by conjunctions as [ha] "so" and [wa] "and," and names when preceded by vocative marker as [ja]. Based on my intuition, I think [dʒlɪs] "sit down" and [ħmad] "Ahmad" when preceded these conjunctions, the first consonants resyllabified as follow, [hadʒ.lɪs] "so sit down," and [jaħ.mad] "O, Ahmad." But, when the word begins with a single consonant such as [su:g] "drive," and [fahad] "Fahad," such resyllabification does not occur and so realized as [ha.su:g] "so drive!" and [ja.fahad] "O, Fahad." It should be noted here that the target sequences are preceded by vowels, which I assume allow them to syllabify easily. However, in other cases, resyllabification does not occur even if they were preceded by a vowel, as in [jaxi dʒlɪs] "O brother, sit down!" Therefore, such observations maybe lead to adoption of the extrasyllabic parse in (19b), in which the first consonant is floating on its own and can be resyllabified when it is required.

However, a phonological piece of evidence from hypocoristics (nicknames) outbalances the syllabification representation in (19a). Hypocoristic data have been proved useful to show the

tonal melody in Hausa (Newman & Ahmad, 1992), and prosodic template (McCarthy & Prince, 1986; Scullen, 1993; Weeda, 1992; Zawaydeh & Davis, 1999). I observed that hypocoristics in JA mostly follow one pattern (61). For our purposes, this is also applicable to names with two consonant sequences in JA. Consider the following examples in (61d-e).

61) JA hypocoristics

Original Form	Hypocoristic Form
a. [xaaled]	[xalluud]
b. [ħasan]	[ħassuun]
c. [ʕaadel]	[ʕadduul]
d. [ħmad]	[ħammuud]
e. [mdʒed]	[madʒdʒuud]

First, it is evident that those hypocoristics follow one pattern, regardless of the number of the syllables in their original forms. Second, it is noticeable that consonant sequences in (61d-e) are broken by a vowel, which indicates that these are *false* clusters not *true* clusters (Cyran, 2010). As for their templatic structures, following Zawaydeh and Davis (1999), these hypocoristics have the same input in (62), consisting of an empty morpheme labelled H, and two bimoraic vowels; /a/ and /u/.[10] This input results to outputs with four moras as in (62).

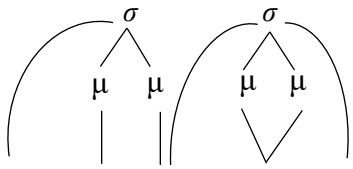
62) Hypocoristics input

```
      μ μ   μ μ
       \ /   \ /
/H + a     u/
```

[10] /a/ is indicated as bimoriac although it does not surface long in hypocoristics. This avoids having a floating mora when dealing with gemenation of the medial consonant in hypocoristics (Zawaydeh & Davis, 1999).

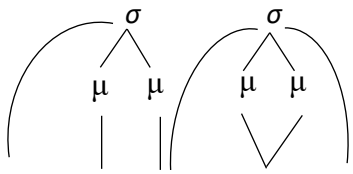
63) Hypocoristics outputs

a. Mora structure of [ħammuud]



= [ħammuud]

b. Mora structure of [madʒdʒuud]



= [madʒdʒuud]

These moraic structures suggest that the first consonants of hypocoristics, and importantly in names that had consonants sequences, are extra-prosodic and therefore not moraic. This argument challenges the previous analysis above, suggesting that first consonants in two consonant sequences in JA are adjuncts rather than extrasyllabic. Therefore, this moraic and templatic analysis leads to adoption of the adjunct parse in (19a) for word-initial consonant sequences in JA.

In fact, the two representations may not be that different after all. Given the notion of prosodic licensing (Itô, 1986), for an extra syllabic consonant to be pronounced, it has to be linked to some prosodic structure. Therefore, for any representation starting out as a floating C, it will have to be parsed prosodically in order to be pronounced. In this sense, the representation starts out as 19b, it would be realized as 19a, or the representation simply starts out as 19a and the adjunct C simply gets resyllabified in connected speech in some cases. Now that we covered the phonological aspects of JA, in Chapter 4 I discuss the sociolinguistic aspects of the dialect.

CHAPTER 4. SOCIOLINGUISTIC PERCEPTIONS OF JAZANI ARABIC

4.1 Introduction

The aim of this chapter is to explain some of the stereotypes, beliefs, and attitudes that speakers of other Saudi dialects have toward Jazani Arabic, as well as identify the dialect's socially salient phonetic features. The chapter examines whether word-initial consonants sequences (discussed in Chapter 2 and Chapter 3) and /r/ contribute to the identification of and the attitudes toward JA speakers. The chapter first reviews approaches used in the study of folk linguistics, a term used to describe lay people's beliefs about or attitudes toward a language (Preston, 1993a). It covers perceptual dialectology, sociophonetics, and language attitude studies related to the current study. Later, it presents new sociolinguistic data on JA, testing Saudis' ability to identify JA speakers, uncovering attitudes toward JA, and revealing JA salient sociophonetic features.

As demonstrated in Chapter 1, when lay people label a Jazani dialect speaker, they mostly say Jazanis sounds like Yemenis. Yet the sociophonetic similarities between Jazani and Yemeni Arabic have not been addressed. As discussed in Chapter 2, a few studies have looked at some linguistic aspects of JA. Himli (2014) documented and translated Jazani folktales, Shamakhi (2016) studied syntactic aspects of Jazani, Hamdi (2015) briefly described some phonological aspects of JA, Ruthan et al. (2019) examined the syllable structure of word-initial consonant sequences, and Ruthan (2017) surveyed attitudes toward JA. In this limited literature, we know from Hamdi (2015) and Ruthan et al. (2019) that JA has word-initial consonant sequences, and from Ruthan (2017) that non-emphatic /r/ in JA potentially appears in phonological environments different from those in Saudi dialects but similar to those of Yemeni Arabic. These two features are features of Yemeni Arabic (Greenman, 1979; Prochazka, 1987; Watson, 2002). Therefore, it is ideal to investigate the contribution of these common features in JA and Yemeni Arabic on the

identification and attitudes toward JA. Since no sociolinguistic descriptive or attitude study exists for JA, this gap motivated the current study's twin aims: to identify the socially salient sociophonetic features of JA and determine the role they play in shaping Saudi attitudes about JA.

4.2 Background

In Sections 4.2.1 to 4.2.1.2, I review relevant studies about language attitudes and perceptual dialectology of languages, such as the varieties of English and Arabic (Garrett et al., 2005; Preston, 1993b). Later, in Sections 4.2.2 to 4.2.2.2, I review sociophonetic perception studies in English and Arabic. The goal of this review is to highlight results and methodologies, some of which have been used in this dissertation, and to show how effectively they work for the purpose of the current study. The remaining sections of this chapter report on the results of a language attitudes survey conducted for this dissertation.

4.2.1 Language Attitudes and Folk Linguistics

Attitude is a fundamental notion in sociolinguistics which has been of increasing interest among sociolinguists, especially after Labov (1966) introduced the concept in his study of the New York City speech community. His study is one of the earliest studies to examine linguistic attitudes, in which Labov asked New York participants to listen to audio recordings that included instances with and without the production of post-vocalic /ɹ/ and asked them to rate the voice samples on a 7-point occupational suitability scale. All social groups rated the sample voice lower on the occupational scale when they noticed post-vocalic /r/ was absent. These findings showed New Yorkers from different social groups were aware of and sensitive to non-rhoticity and had attitudes about it.

Since then, sociolinguists have been considering attitudes in research to reveal naïve or lay beliefs, stereotypes, and attitudes about languages, language varieties, and dialects. Many scholars

have examined attitudes toward languages or language varieties in English (e.g., Garrett et al., 2005; Preston, 1986, 1993a, 1993b), German (Dailey-O'Cain, 1996), French (Evans, 2002), Spanish (Fernández & Fernández, 2002), and Saudi Arabic (e.g., Aldosaree, 2016; Alhazmi, 2018; Alrumaih, 2002) among many other languages and speech communities.

Although attitude is profusely researched, the definition of "attitude" is elastic. Among researchers, who have attempted to define "attitudes," Oppenheim (1982) defines attitude as follows:

> a construct, an obstruction which cannot be directly apprehended. It is an inner component of mental life which expresses itself, directly or indirectly, through such more obvious processes as stereotypes, beliefs, verbal statements or reactions, ideas and opinions, selective recall, anger or satisfaction or some other emotion and in various other aspects of behavior. (p. 39)

However, language attitude is different from attitude in general, in which the concern is languages or their varieties. Therefore, Ryan et al., (1982) defines language attitude as "any effective, cognitive, or behavioral index of evaluative reaction towards different language varieties and towards their speakers" (p. 7). The later definition indicates that individuals have certain reactions to different languages or varieties. Such reactions are based on beliefs, or opinions that create or promote linguistic diversity. The two definitions imply that attitudes have three components: cognition (beliefs and stereotypes), affect (evaluations), and behavior (Cargile et al., 1994; Garrett, 2010). By cognition, it is meant to refer to the cognitive process by which someone has existing stored beliefs in mind for certain objects in the world (Cargile et al., 1994). With respect to affect, people's attitudes convey either positive or negative, desirable or undesirable feelings toward an object or a language/variety (Cargile et al., 1994; Garrett, 2010). Lastly, attitudes are behavioral

since they promote actions such as enrolling in a Japanese language course or hiring someone with a prestigious accent for a job (Cargile et al., 1994). Now that we have discussed the attitude's three components, in the rest of this section, I discuss a research area that relates to language attitude research: *folk linguistics*, both of which complement each other.

In contemporary sociolinguistics, *folk linguistics* was first proposed by Hoenigswald (1966) and later embraced by many scholars, e.g., Niedzielski and Preston (2010) and Preston (1993b). Folk linguistics has been defined as "the views and perceptions of those who are not formally trained experts in the area being investigated" (Garrett, 2010, p. 179). Therefore, folk linguistics is interested in and centered on non-linguists' views and perceptions. Within the field of folk linguistics, *perceptual dialectology* is a subfield which "represents the dialectologist's-sociolinguist's-variationist's interest in folk linguistics" (Preston, 1999, p. xxv). It asks the following: (a) "What do non-specialists have to say about variation? (b) Where do they believe it comes from? (c) Where do they believe it exists? (d) What do they believe its function is?" (Preston, 1999, p. xxv). Therefore, it examines lay people's perceptions of language or dialect variations. While folk linguistics and perceptual dialectology seem to overlap over the concern of lay people's perceptions, beliefs, and attitudes, they differ in the methodology used (Preston, 1999, 2011). With respect to methods, folk linguistics studies use questionnaires and fieldwork interviews, whereas perceptual dialectology studies use maps or the matched-guise tests to reveal perceptions, stereotypes, and attitudes, as well as people's folk linguistic views. Another essential distinction between the two lies in the goal, where folk linguistics is used to elicit lay people's overt stereotypes/attitudes, whereas perceptual dialectology is used to elicit covert attitudes.

Preston (1986) pioneered the method, known as a perceptual map-drawing task, of investigating lay people's perceptions of English regional varieties. In this task, respondents are

asked to draw boundaries where they think people speak different varieties (Preston, 2002). Although the current study did not adopt this method, it is important to mention due to its relevance to some English and Saudi Arabic studies that incorporate this technique described below. The next section reviews relevant studies in language attitudes and perceptual dialectology in English and Arabic, followed by a discussion of their methodologies.

4.2.1.1 Attitudes Toward English Varieties

Preston (1993b) investigated southeastern Michigan and southern Indiana respondents' perceptions of US dialects. Subjects drew boundaries on maps of US regions in which they thought people spoke alike. The respondents were also asked to rate the 50 states along with Washington D.C. and New York City for correctness, pleasantness, and degree of difference. Respondents from southern Michigan rated themselves highly in correctness and pleasantness, revealing high linguistic security. In contrast, respondents from southern Indiana rated other states higher than themselves in correctness and thus showed linguistic insecurity. This was attributed to US cultural stereotypes about Southerners and Southern accents, and southern Indiana respondents believed themselves to speak this stigmatized variety. Therefore, the judgments and stereotypes of other people caused Indiana respondents to rate themselves lower in correctness.

Along the same lines, Hartley's (1996) study on Oregonians agreed with Preston's (1993b) results. Hartley (1996) revealed an influence on the evaluation of one group toward another based on stereotypes. For instance, Oregon respondents did not differentiate themselves from people from Washington but differentiated themselves somewhat from California. This was attributed to the fact that Oregonians associated southern Californian with the large number of Spanish-speaking residents in that region. Unlike southern Indiana respondents, who thought they spoke a stigmatized variety, Oregonians did not consider themselves part of the stigmatized variety in

southern California and thus did not feel they were stigmatized. Rather, similarly to Michiganders in Preston (1993b), Oregonians rated themselves highly in terms of pleasantness and correctness, showing high linguistic security. Both Preston (1993b, 1993a) and Hartley (1996) found that linguistic security was associated with certain social factors, such as stereotyping and stigmatization.

More recently, Garrett et al. (2005) examined attitudes toward US, UK, Australian, and New Zealand varieties of English. Respondents did not listen to audio recordings. Rather, the attitudes were based on what they called a "conceptual mode of presentation" with the evaluation based on only the names of the varieties presented by the respondents themselves. The respondents were asked to name eight countries in which English is spoken as a native language and mention how English is spoken in those countries. Respondents mentioned American, British, Australian, New Zealand, Canadian, Scottish, Irish, and Welsh English. Using a keyword technique in which respondents were directly asked to write down whatever comes to mind about the named variety of English, respondents pointed out some linguistic features they knew of, such as non-rhotic pronunciation and the pronunciation of right as "roight" and six as "sux." Respondents also employed positive and negative emotional expressions such as "ugly" and "friendly," social norms such as "intelligent," and cultural associations, e.g., "Jerry Springer" (a globally famous talk show host) for US English. Based on these responses, the researchers created groups to categorize all the qualitative answers that were provided, such as linguistic features, comparison, status and social norms, and culture. They then conducted a quantitative analysis of those categories. To keep it short, I only highlight general findings from the study without reporting percentages. Results showed that Australian and New Zealand English received the highest amount of positive affect comments, while US English received the highest amount of negative affect comments. English

English attracted a moderate amount of both kinds of comments. In the status and social norms category, English English attracted the highest amount of cultured comments, while Australian and US Englishes attracted the highest amount of uncultured comments. In the cultural association category, comments were mainly media related. Australians were the least likely to produce such comments, compared to all other groups who mentioned these comments on Australian English. New Zealand English received more comparison comments such as "similar to Australia" and "not as friendly as Australian," than Australian English, which attracted fewer comments such as "similar to New Zealand." With the extension of this line of research to Arabic, the following section reviews some relevant attitude studies in Arabic.

4.2.1.2 Attitudes Toward Arabic and Saudi Dialects

Along with the social functions and status of Classical and Colloquial Arabic, attitudes studies of Arabic varieties have consistently shown that respondents consider Standard Arabic across the Arab world to be overtly prestigious and with higher evaluations in contrast to Colloquial Arabic varieties (Al-Muhannadi, 1991; Hussien & El-Ali, 1989; Saidat, 2010). Studies have revealed some sort of stability for Classical Arabic when compared to Colloquial Arabic.

When Standard Arabic is attitudinally compared with other languages like English and French, the picture becomes less clear and the usage purpose plays a role in this context. For instance, El-Dash and Tucker's (1975) attitude study toward Colloquial Egyptian Arabic, Classical Arabic, and Egyptian English showed more positive attitudes for Classical Arabic than Colloquial Egyptian or Egyptian English in the context of school, television, radio, and religious or formal speeches. Similarly, Shaaban and Ghaith's (2002) study showed that Arabic is preferred for the same purposes, French is preferred and associated with cultural activities and self-expressions, whereas English is the language used in science, business, medicine, higher education, and

technology. In postcolonial countries like Morocco, Chakrani and Huang (2014) and Bentahila (1983) found that French and English are iconic for modernity, and a means for science and technology, while Moroccan Arabic, Standard Arabic, and Berber are inefficient for educational context, but represent Arabic culture and identity.

Studies of attitudes on Colloquial Arabic varieties, in contrast, have not shown a consistent preference for one dialect over the others. Rather, attitudes toward the Colloquial Arabic dialects differ from one dialect to another. This is due to the existence of Arabic varieties associated with different nationalities, such as Saudis, Egyptians, and Moroccans. In general, Saudi Arabic is considered as a high prestigious variety due to its geographic association with the birthplace of Arabic. Egyptian Arabic is also a prestigious variety due to its primary and influential rule in the Arab media, a variety spoken by the largest population in the Arab world at 82.5 million speakers (Chakrani, 2015; Sawe, 2018). In contrast, Sudanese Arabic and Moroccan Arabic have lower prestige due to their contact and association with African languages, and with French and Berber respectively (Chakrani, 2015). Below, I review more attitudes studies on Arabic varieties.

Starting with a broader scope, Theodoropoulou and Tyler (2014) looked at the perceptual dialectology of the Arab World using a map task and asked female undergraduate students at Qatar University to pick places where people spoke alike on a map of the Arab World. The respondents were from different Arabic and non-Arabic-speaking countries, including Qatar, Yemen, Syria, Philippines, England, Saudi Arabia, Egypt, and Jordan. Respondents grouped Arabic dialects into five main categories: Egypt and Sudan, including dialects spoken in Egypt and Sudan; the Maghreb, including dialects spoken in Tunisia, Morocco, Libya, and Algeria; Somalia, for the dialect spoken in Somalia; the Levant, including dialects spoken in Lebanon, Palestine, Syria, and Jordan; and the Gulf, including dialects spoken in Iraq, Bahrain, Qatar, Yemen, Oman, the United

Arab Emirates, and Saudi Arabia. In general, respondents provided and agreed upon some labels associated with certain dialects. For instance, the Qatari dialect was described as "classy," Maghreb dialects as "strange and hard to understand," Gulf dialects excluding Yemeni as "similar," Egyptian as "brag," and Sudanese as "lazy."

In a similar vein, but with a wider subject pool, Abdel-Rahman (2016) surveyed 716 Arab participants, (43.85%) males and 402 (56.15%) females from 20 Arab and non-Arab countries (e.g. the United States or Europe) to examine Arabic speakers' perceptions of the different Arabic varieties. Participants were given a detailed map of the Arab World and were asked to identify dialects of Arabic as many as they could by drawing boundaries on the map of zones where they thought regional speech varieties existed. Results showed that participants categorized Arabic dialects into the five major dialects of Arabic which are recognized by naïve native Arabic speakers (Bassiouney, 2009; Owens, 2013). These are Egyptian, Moroccan, Levantine, Gulf, Djibouti, Somalia, and Sudan. Such categorization is comparable to that of Theodoropoulou and Tyler, 2014 . Although Egyptian Arabic was the most recognized Arabic variety (12.16%) compared to Saudi Arabic (2.23%) in the map task, respondents considered Saudi Arabic as the closest variety of Arabic to Modern Standard Arabic (24.61%), and Egypt only (7.03%), in responding to the question "Which dialect do you believe to be the closest to MSA?" Interestingly, the majority of responses (71.42%) for this question came from Egyptian participants themselves. Later, respondents listened to five varieties, Tunisian, Egyptian, Kuwaiti, Syrian and Iraqi and were asked to rate them on a 4-point Likert scale based on degree of difference (to the respondents' dialect), correctness, pleasantness, and closeness to Modern Standard Arabic. Results yielded that Tunisian Arabic is the most rated variety as unintelligibly different from the respondents' dialects and incorrect, while Egyptian Arabic was the most rated variety as the same dialect as the respondents'

dialects and correct. In terms of pleasantness, Tunisian, and Kuwaiti Arabic were highly rated as unpleasant, whereas Egyptian is the variety most perceived as pleasant. With respect to the closeness to Modern Standard Arabic, Egyptian Arabic was rated high on its closeness to Modern Standard Arabic, while Tunisian Arabic was perceived as the most distant Arabic variety to Modern Standard Arabic.

These findings show that respondents were exhibiting linguistic security and in-group loyalty, as the majority of the participants are Egyptian (58%), so Egyptian Arabic was rated high on correctness, pleasantness, similarity to the respondent's dialects and closeness to Modern Standard Arabic. Initially, Egyptian closeness to MSA may seem contradicting an earlier result, which is that SA is found to be the closest spoken variety to MSA. However, in the perception task, the respondents had only listened to five varieties and SA was not one of them. Therefore, respondents' judgment that Egyptian is the closest variety to MSA is only a reflection to the presented audio stimuli. In other words, if SA was presented in the perception task, it is possible that judgment may shift to SA as the closest variety to MSA. From a different angle, regardless the absence of SA from the perception task, these findings indicate that the conceptually and the vocally presented approaches may have different implications.

As mentioned previously, Saudi regional dialects are socially stratified, yet few studies have surveyed attitudes about Saudi Arabic dialects at the regional level. One of the earliest and only studies to survey Saudi speakers' perceptions about Saudi dialects was conducted by Alrumaih (2002). He surveyed Najdi perceptions about other varieties of Saudi Arabic. Modeled after Preston's (1986) map-drawing strategy, Alrumaih asked participants to draw boundaries on a blank map of Saudi Arabia where they thought people spoke differently. The respondents drew the same Saudi regional dialect boundaries. Respondents were asked to rate Saudi regional dialects

from a list on a Likert scale of correctness, pleasantness, and degree of difference. For degree of difference, they rated how similar or different the speech of the different regions was to their own speech, namely Najdi dialect. Najdi respondents rated themselves very high in correctness and pleasantness and were therefore linguistically secure when they compared their dialect to other regional dialects. However, they rated the Southern dialect low, below all other dialects on average, for correctness and pleasantness, but rated it high on the degree of difference scale as "People there sound very different from me."

Another study on attitudes toward Saudi dialects was conducted by Aldosaree (2016), who employed an online survey, incorporating a questionnaire, and interviews to examine attitudes toward Najdi, Hijazi, and Southern dialects or what he called "Janoubi" (a transliteration for the word southern in Arabic) of Saudi Arabic. In an online questionnaire administered via a Google Form, participants from the east, the west, the central, the south, and the north regions of Saudi Arabia had to listen to audio clips of Njadi, Hijazi, and Southern speakers, then had to choose characteristics from a list of adjectives that suited the presented speaker. These comprised positive and negative characteristics, such as "friendly," "kind," "lazy," and "arrogant." Aldosaree attributes the inclusion of these adjectives to the fact that such adjectives which describe personal traits are common when laypeople describe dialects in Saudi Arabic. The respondents were more likely to describe their attitudes toward the Southern speaker[11] with positive characteristics, e.g., brave, humble, and kind, rather than negative characteristics. This might be attributed to the unbalanced adjective list, which contained only two negative and eight positive characteristics. But in the interviews, participants expressed negative attitudes toward the socio-economic status

[11] However, from the provided script by Aldosaree (2016), I am sure the speaker is from Faifa, so technically the dialect used in that study was the Faifi dialect, which is different from JA.

of the Southern speakers. For instance, an interviewee stated, “I have not seen a Southern speaker hired as a minister in Saudi Arabia,” assuming that jobs are associated with dialects. Thus, the study showed it is not only Najdi speakers, as in Alrumaih (2002), who have a low opinion of southern dialects. This opinion is shared across speakers of other dialects of Saudi Arabic.

Alrumaih (2002) and Aldosaree’s (2016) findings raise the following questions. Why did Alrumaih’s (2002) Najdi respondents view southern dialects particularly unfavorably? Why did Aldosaree’s (2016) respondents view the southerners as having a low socio-economic status? Were these views due to a combination of linguistic features and social factors of the southern dialect?

While Alrumaih (2002) and Aldosaree’s (2016) studies broadly surveyed the perceptions of or attitudes toward all or three Saudi dialects, other studies have mainly focused on one Saudi variety, such as Makkan Hijazi dialect (Alahmadi, 2016) and the urban Bedouin Hijazi and Hadari Hijazi dialects (Alhazmi, 2018). In addition, Alrumaih and Aldosaree’s studies did not examine specific sociophonetic features, whereas Alhazmi (2018) controlled for sociophonetic features to examine their contributions to the perception and attitudes toward the examined dialects. However, before discussing Alhazmi’s (2018) study (Section 4.2.1.2, in the following paragraph), it is important to look at Alahmadi (2016).

Alahmadi (2016) surveyed urban Meccan Hijazi Arabic speakers’ attitudes toward their own dialect. In her study, she focused on whether the social variables of sex, age, and education affected their attitudes and perceptions. Alahmadi recruited 80 respondents to complete a questionnaire containing 26 items on a 5-point Likert scale to elicit participant attitudes. In general, all respondents regardless of age, sex, or education viewed their dialect positively and wanted to preserve and use their dialect, as it expressed their solidarity and identity. Therefore, Meccan respondents believed they should use their dialect everywhere, not only in Mecca. The respondents

considered their dialect to be a representation of Hijazi culture. Therefore, as a sign of affiliation, most respondents preferred to be speakers of the Hijazi dialect rather than any other dialect. Not only that, they believed their dialect needed to be presented in TV shows. Although the design of Alahmadi's study was different from the current study, it shows evidence of the concept of in-group loyalty, in which a social group exhibits positive attitudes toward their own dialect. However, the study only surveyed attitudes toward urban Meccan Hijazi Arabic.

To address the abovementioned gap, Alhazmi (2018) examined attitudes toward the urban Bedouin Hijazi and Hadari Hijazi by asking respondents to rate the speakers, who represented the two dialects, on a 5-point semantic differential scale for four evaluative scales: traditional, modern, similar to other Arabic dialects, and serious. Respondents perceived speakers of the urban Bedouin Hijzai as traditional and serious, whereas speakers of the Hadari Hijazi were perceived as modern and similar to other Arabic dialects. The respondents showed a high level of in-group loyalty by rating their own dialects higher on scales that best characterized them. That is, the urban Bedouin Hijazi speakers rated themselves high on the traditional scale, while the Hadari Hijazi speakers did so on the modernity scale. Alhazmi concluded the observed pattern was evidence of a dichotomous dialect situation in which urban Bedouin Hijazi is stereotypically associated with traditionalism and seriousness, while Hadari Hijazi is stereotypically associated with modernity and resemblance to other Arabic dialects. Essentially, when respondents were asked which Arabic dialects were similar to Hadari Hijazi, most chose Egyptian Arabic to sound more like Hadari Hijzai, and to a lesser extent Levantine, Sudanese, and Yemeni Arabic. Alhazmi attributed this finding to geography, as these dialects were likely perceived to be similar to Hadari Hijzai because these are dialects of neighboring countries to Saudi Arabia. Furthermore, the researcher attributed the finding to external migration, as settlers from the abovementioned countries have dwelled in Hijaz

region and became part of it. Thus, the spoken dialect by these settlers, the Hadari Hijaz, is perceived to share linguistic features similar to those in the settlers' original dialects. This last point provides evidence for lay people's awareness of the linguistic features of non-Saudi Arabic dialects, showing their ability to compare their linguistic features to Saudi regional dialects. In the survey conducted for the present dissertation (Sections 4.5 to 0), the assumption that participants would be able to compare Saudi dialects with Yemeni dialects was therefore made.

What is relevant from the studies reviewed above to the current study is that language attitudes derive from beliefs and stereotypes about speakers and social groups. For example, in Theodoropoulou and Tyler (2014), Alrumaih (2002), and Aldosaree (2016), most of the respondents' comments came from general social stereotypes that have been associated with these dialects rather than comments that described sociophonetic or other linguistic features. In other language attitude studies, such as Garrett et al. (2005), lay people have been able to mention some social stereotypes comments such as "kangaroo," "koala," "tough," and explicitly state salient sociophonetic features, such as non-rhotic accents or the pronunciation of "right" as "roight," that correlated with the speech named, something which is not attested in the previous research on Saudi Arabic dialects (Aldosaree, 2016; Alhazmi, 2018; Alrumaih, 2002). Therefore, one aim and motivation of this research to fill this gap by examining whether Saudi lay people can determine and mention salient sociophonetic features associated with JA. The researcher expected that respondents would be able to mention linguistic and specific sociophonetic features of JA that stood out to them. Thus, it is essential to review some studies that relate to dialect identification and perception of sociophonetic variation in the context of both English and Arabic research.

4.2.2 Perception of Speech and Sociophonetic Variation

A large body of research has shown that phonetic variation in speech can signal social information. Such studies have shown that lay people can identify a speaker's regional dialect origin (Bush, 1967; Preston, 1999), ethnicity (Buck, 1968; Purnell et al. 1999), and other personal characteristics (Campbell-Kibler, 2007; Preston, 1999). Focusing on dialect identification, lay listeners use a variety of phenomena at all levels of the grammar to identify regional dialects, such lexicon, morphology, and prosody (Barkat et al., 1999; Foreman, 1999; Gooskens & Heeringa, 2006). However, the question is whether lay listeners can identify regional dialects of a language just from the phonetics/phonology alone?

An essential approach in sociolinguistic perception used by scholars (e.g., Bush, 1967) and revived by Preston (1999) is dialect identification, in which respondents are asked to determine the regional dialect of a speaker in the audio sample. In some studies, this approach is borne out to be effective as it provides evidence that social information and regional dialect origin can be extracted by listeners from audio recordings (e.g., Bush, 1967; Campbell-Kibler, 2007; Clopper & Pisoni, 2004). However, in other studies (e.g., Boughton, 2006), this technique has not given accurate results in the dialect identification task, for reasons discussed later. Below, I review relevant studies that have examined perceptions of languages and dialects.

4.2.2.1 English Studies

Bush (1967) was one of the earliest studies to examine naïve listeners' ability to identify different speakers' regions of origin based on actual speech samples. In her study, respondents listened to speakers reading real and nonsense words and sentences, and based on those recordings, they had to identify speakers' nationality, who were from the US, the UK, and India. Results showed listeners could identify national origin with a high accuracy of up to 90%.

More recently, Clopper & Pisoni's (2004) study on six American English speakers' dialect origin confirmed that some phonetic cues are associated with different regional dialects. For instance, in a perceptual categorization task, respondents were asked to listen to recordings of sentences and categorize speakers. Respondents were able to categorize speakers when given broader regions (New England, South, North/West), but this became more difficult when given six regions (New England, South, North, West, North and South Midland). Respondents relied on attributes of the presented dialect like the New England non-rhotic accent, or Northern /oʊ/ offglide centralization, and attributes such as Northern /u/ backness and other vowel cues. After the perception task, a follow-up questionnaire was carried out to ask respondents what linguistic properties they used in the categorization task. Respondents explicitly mentioned features or sounds like "o" and "a," or words the researcher expected to be good predictors of regional US dialects, such as "greasy" vs. "greazy" and "wash" vs. "warsh."

Campbell-Kibler (2007) convened focus groups of students at Stanford University. She played original unmanipulated audio excerpts from sociolinguistic interviews with four male and four female speakers from California and North Carolina. She asked participants open-ended questions, including the question "Where do you think the speaker is from?" (p. 37). Out of the four North Carolinians, three speakers were highly perceived as Southerners, while one speaker was mostly perceived as a coastal speaker, primarily the West Coast. The respondents relied on and explicitly mentioned some linguistic cues such as monophthongization of /aj/ as an indicator for the three southern speakers, whereas respondents could not identify regionally marked features for the fourth speaker. Rather, this speaker was broadly described as having a laid-back persona. With respect to the Californians, three speakers were perceived as aregional ("might be from anywhere"), while one speaker was perceived as a West Coast speaker.

Studies reviewed above on dialect identification or categorization have shown that naïve listeners can identify speakers' regions of origin. Regardless of varying accuracy rates, these findings show that lay people are aware of phonological differences in dialects and can evaluate the presented speech. Clopper and Pisoni (2004) and Campbell-Kibler (2007) are important to the current study in two ways. First, the present study used actual, unmanipulated speech samples in an online survey, although not a matched guise task, to examine Saudi naïve listeners' ability to identify Jazani speakers' regional dialect and what attitudes the listeners had toward a specific dialect. Second, although the present study did not use interviews, it did employ open-ended questions (see APPENDIX F) in the online survey to determine whether respondents found specific sociophonetic features to be salient.

In the Arabic context, there are a few studies that have looked at either the perception of the dialect as a whole or the perception of specific linguistics features of certain dialects of Arabic. Below, I review some of these studies that are closely related to the current dissertation.

4.2.2.2 Arabic Studies

In a broader context, Abdel-Rahman (2016) examined Arabic speakers' perceptions and whether they can identify five different Arabic varieties. Respondents of 20 different Arab nationalities had to listen to five audio clips: one for each of an Egyptian, Syrian, Iraqi, Tunisian, and Kuwaiti speaker and identify their region/national of origin. These audio clips had different scripts and were not controlled for linguistic information, such as lexis, nor controlled for metalinguistic information like proper names. Results showed that Egyptian Arabic was the most correctly recognized variety (98.99%) among the others, whereas Tunisian was the least to be identified (38.65%).

In a narrower context, Aldosaree (2016) examined the perceptions and attitudes of Saudi speakers regarding Najdi, Hijazi, and Southern dialects. Three speakers – one from each dialect region –were recorded reading a passage about a car accident they experienced; 135 respondents came from the eastern, western, central, and southern regions of Saudi Arabia, including 69 high-school students and 66 college students. In a dialect identification task, participants had to guess the speakers' dialects based on what they heard. Essentially, 78% of the respondents could identify the Southern speaker, 73% perceived him as suburban, 80% thought he was working class, and only 6% thought he was an upper-class person.

Addressing social group differences, Alhazmi (2018) investigated Hijazis' perceptions of their own dialect varieties, specifically Hadari Hijazi and the urban Bedouin Hijazi dialect, asking which of the two was dominant, what differentiated them, and their attitudes toward them. In the survey, respondents considered the Hadari Hijazi as the reference and dominant dialect in the Hijaz region. Most participants considered the two dialects to be different on many levels, but crucially, respondents thought sounds were the most important linguistic aspects differentiating them. Later in her study, Alhazmi played recordings of five male and female speakers of either urban Bedouin or Hadari Hijazi with real or fake surnames (as names are stereotypically associated with different social groups), reading a script about the weather. Those voice samples had different sets of salient phonological features, such as /ð/, /r/, /θ/ for urban Bedouin Hijazi and /z/, /ɾ/, and /s/, which are variants for the same three phonemes, for Hadari Hijazi. In this way, respondents were forced to rely more on linguistic than metalinguistic information in the perception of the presented Hijazi speakers. That is, the manipulation of the dialects affected respondents' answers in identifying the social group of the speaker more than when the surnames were manipulated. In other words,

respondents used /ð/, /r/, and /θ/ as cues to identify the social and spoken dialect by the urban Bedouin Hijazi speakers and /z/, /ɾ/, and /s/ as cues to identify the Hadari Hijazi speakers.

Alhazmi's (2018) study is important and relevant for the current dissertation in two ways. First, it shows respondents' awareness of different sociophonetic features and how they are associated with different social groups. Second, it may show that respondents sometimes pay more attention to linguistic than to metalinguistic information. In the present study, I used word-initial consonant sequences and instances of /r/ to examine whether Saudi naïve listeners associate these features with Jazani speakers by showing their ability to identify Jazani speakers' regional dialect. Also, in the presented audio sample, I avoided stereotypical Jazani proper names, such as Yahya, and Abdu, deliberately to make participants focus on linguistic rather than metalinguistic information. Rather than presenting and relying on sociophonetic features as Alhazmi (2018) did, the current research elicits information from respondents to determine linguistic and salient sociophonetic features of JA.

4.3 Research Questions and Hypotheses

After reviewing the most relevant studies on perceptual dialectology, language attitudes, and socio-phonetic perception, I turn to state the research questions for this portion of the dissertation and lay out the hypotheses. Since there are no studies on attitudes to and the sociophonetic features of JA, the aim of this research is to fill this gap by uncovering the socially salient phonetic features of JA, and the extent to which they serve to trigger identification of and attitudes to JA. Therefore, four research questions guide the dissertation, these as follow:

1. Can native speakers of other Saudi dialects identify Jazani speakers from sociophonetic information alone?
2. What salient socio-phonetic features do participants associate with JA?

3. What are the Saudi speakers' attitudes toward JA speakers?
4. Do social factors affect attitudes to JA?

I hypothesize the following:

a. Yes, speakers will be identified as Jazani speakers. However, based on stereotypes and results from the pilot study, Jazani speakers will be perceived as Yemeni speakers. Accordingly, I expect that the three Jazani speakers in this study will be compared to Yemeni speakers or even identified as Yemenis.

b. Non-emphatic [r] will be mentioned by participants. The more non-emphatic [r] a speaker produces, the more he/she will be identified as a Jazani speaker. This expectation follows from the respondents' observations in the pilot study (Ruthan, 2017), when this feature stood out for the respondents, and thus, it is expected to play a role in the perception of the three Jazani speakers. Other sociophonetic features such as word-initial consonants sequences will also be mentioned.

c. Overall, I expect a neutral attitudes pattern. If this is not the case, then:

    I. The three Jazani speakers will be perceived as uneducated and unpleasant, but friendly.

    II. They will be rated high for *fast*, due to the vowel deletion (consonant sequences).

    III. All speakers will receive neutral attitudes toward smart vs. stupid based on my intuition. I think these characteristics are more sensitive (as they sound personal) to judge.

d. I expect effect by social factors. There will be different attitudes based on respondents' regions of origin, given the fact that Saudi regional dialects are socially stratified, thus

attitudes will vary. Therefore;

I. Najdi speakers will indicate negative attitudes more than Southerners and others, since they are speakers of a prestigious variety and so linguistically secure.

II. Southerners will be more positive, since they are speakers of the same dialect or speakers of similar southern dialects. So, they may pay less attention and give less criticism to variations in speech.

To test these hypotheses and answer the questions above, I utilize various approaches from a range of perceptual, attitudes and socio-phonetic studies reviewed above, which are linked to the current research discussed in the following section.

4.4 Methodology: Approaches to Uncovering Language Attitudes

My approach to uncovering attitudes about JA combined several methods that have been successfully employed in the study of linguistic perception and introduced in the reviewed studies in previous sections. With respect to identification of JA, I modeled the methods after Preston (1986), using unmanipulated audio recordings of three Jazani speakers, which the respondents listened to one by one before identifying the speaker's regional dialect.

With regard to attitude, although many sociolinguistic perception and attitude studies have targeted respondents' implicit attitudes through matched guise tests (e.g., Campbell-Kibler, 2007; Lambert et al., 1960) and other experimental manipulations (e.g., Levon, 2007; Niedzielski, 1999), I targeted explicit attitudes about JA using a vocally presented approach rather than a conceptually presented approach (Alhazmi, 2018). I opted to look at explicit attitudes because no prior work had elicited the salient features of JA, making it difficult to know what features to manipulate in an implicit attitudes task. Following Campbell-Kibler (2007), I asked the respondents to listen to

and rate each speaker on a 6-point Likert scale with traits, such as slow vs. fast and educated vs. uneducated, to determine their attitudes about JA and what social characteristics they associated with JA speakers.

To determine how Jazani speakers are perceived and elicit salient features of the dialect, I used an approach similar to that of Garrett et al. (2005), in which I asked respondents open-ended questions (see APPENDIX F) to elicit more informative data. These questions were presented twice in the survey to reveal implicit and explicit attitudes about JA. To quantify the qualitative answers, I assigned respondents' answers to categories, such as "cultural association" and "comparison." This method allowed respondents to express their feelings in more detail and avoided more limited answers. Before delving into results, I present the methods in the next subsections, followed by respondents' recruitment and their sample.

4.4.1 Script and Audio Stimuli

I created a script (see APPENDIX G), which is a narrative about a former event of watching a soccer match. Some salient linguistic features, such as the definite article /ʔam/ "the," are deliberately not used in the script. The use of /ʔam/ is expected to make the respondents ignore the other linguistic features and thus responses might be mainly centered on /ʔam/.The script included 16 tokens of /r/ in a variety of phonological environments, and four instances of word-initial clusters, which were expected to contribute to listener identification of the speakers as Jazani. At the time of the study, I was not explicitly investigating /r/, and so the /r/ tokens in the script were not explicitly distributed across specific phonological environments.

The script included 16 instances of /r/ in different morphological and phonological environments.

Word-initial position

- followed by a low back vowel as in [rɑjk] “your opinion,” [rɑjd] “proper name” (n= 3)
- followed by a high front vowel as in [rijal] “Real” (n= 2)

Word-medial position

- followed by a low back vowel as in [ʔılmubærɑh] “the match” (n= 4)
- followed by a low front vowel as in [ʔıstıræħat] “resort” (n= 2)
- followed by a high back vowel as in [nuruħ] “we go” (n= 2)
- followed by a high front vowel, as in [madrid] “Madrid” (n= 1)

Word-final position

- preceded by a high front vowel [ʔaxır] “Last” (n= 1)
- preceded by a mid-central vowel [bkar] “proper name” (n= 1)

The script also included three instances of word-initial consonant sequences:

- [ħmad] “Ahmed (proper name)”
- [bkar] “Abkar (proper name)”
- [smaʕ] “listen”

I expected /r/ and word-initial consonant sequences to draw listeners’ attention and to contribute to listeners’ identification and social evaluation of the speaker.

Three educated male Jazani speakers who are friends of the author were the readers of the script. The readers were selected from the same area, Samtah, in Jazan to avoid any variation within the dialect. They were chosen to have similar voice registers. The readers were given the script and asked to read it and fit it in 15 seconds. Although the script was written in Standard Arabic, the readers were asked to read the script in JA. Due to a lack of Jazani speakers nearby (in

the US), the script was emailed to them, and they were instructed on how to record the script. The instructions asked them to read the script as naturally as possible in the Jazani dialect. They were asked to record in a quiet and controlled environment to avoid any kind of background sounds or interference with the recordings.

4.4.2 Procedure

The survey was presented in Arabic language online on the internet using Qualtrics (Qualtrics, 2005) as a delivery platform. The survey follows a within-subject design, whereby each participant heard all three of the speakers reading the script. The survey included the following tasks:

(1) listening to Speaker 1 reading the script;

(2) clicking on a blank map of Saudi Arabia to indicate where the respondent believed Speaker 1 was from;

(3) rating Speaker 1 for 5 of Likert-scaled characteristics, such as *intelligent*;

(4) Answer open-ended questions about the speakers

(5) Answer open-ended questions about JA

Respondents repeated (1)-(4) above for all three speakers. Later, they completed (5). These questions are discussed in turns in the following sections.

4.4.3 Identification Task

In this task, after hearing a speaker, participants viewed a blank map of Saudi Arabia. They were asked to identify the origin of the speaker and indicate his regional dialect by clicking it on the map. This method is used to find out the ability of Saudi laymen whether they can identify a Jazani speaker. I used the heatmap tool in Qualtrics, in which the location of each click/answer by

the respondents was recorded by the tool and classified as belonging to one of the five regions[12] shown below (see Figure 20). However, these divisions were only visible to the researcher, and not the respondents. As a result of those clicks/answers, heatmaps in (4.5.1) were auto generated by the heatmap tool.

Figure 20. Coded map of Saudi Arabia for identification task.

4.4.4 Attitude Rating Scales

After respondents listened to the audio stimuli and identified the speakers' regions of origin in the identification task, they were asked to rate the speakers based on five characteristics in a semantic differential scale from 1 "most negative" to 6 "most positive." These characteristics were *friendly*, *smart*, *fast*, *pleasant (to hear)*, and *educated*[13], which were chosen based on my intuition

[12] These regions correspond to the main Saudi regional dialects, discussed in Chapter 1.
[13] They translate to Arabic as; **مثقف ، مُريح للسمع ، سريع ، ذكي ، ودود**. The difference between *friendly* and *pleasant* is that *friendly* describes the speaker's personality, while *pleasant* (to hear) describes the speaker's speech. The difference between *smart* and *educated* is that *smart* describes the speaker's cleverness, while *educated* describes the level of education.

that such characteristics are often used in daily live to describe someone's speech and so they can be easy to grasp and respondents can easily provide their evaluations of the speakers.

4.4.5 Open-ended Questions

The open-ended questions contained 14 questions, four for each speaker in the stimuli (1)-(4), and two questions on the dialect (5)-(6). These are:

(1) What general impressions or thoughts do you have about the speaker?

(2) What do you think of the speaker's accent?

(3) What are the things about his accent that stood out for you as you listened?

(4) What do you think of the speaker's socio-economic status? That is, what kind of job the speaker might he have, and what kind of education do you think he has had?

(5) What impressions or thoughts do you have when you hear a Jazani speaker?

(6) What are the salient linguistic features that are pronounced differently in Jazani Arabic?

Respondents answered (1)-(4) for all three speakers. At the very end of the survey, they were exposed to questions (5)-(6).

Responses to questions (1)-(4) constituted the *implicit attitudes (indirect approach)* and (5)-(6) the *explicit attitudes (direct approach)*. The *indirect approach* asks indirect or implicit questions which don't draw respondents' conscious attention to the tested dialect (Jazani Arabic). The effectiveness of these questions is that they allow respondents to reveal their attitudes naturally without pressure or knowing what they are tested for. The *indirect approach* aims to elicit beliefs and covert social stereotypes or what I call in this paper *implicit attitudes*. On the other hand, the *direct approach* asks direct or explicit questions which draw respondents' conscious attention and aims to elicit personal beliefs and linguistic prejudice which are overt or *explicit attitudes*.

Incorporating both direct and indirect approaches will benefit the dissertation in eliciting

both types of attitudes and will broaden our scope to see whether results of the two approaches are comparable or contradicting, which could lead to further implication for the methodology.

4.4.6 Respondent Recruitment

Respondents were recruited via a social media site, namely Facebook (see APPENDIX D). I contacted the organizers of the "Saudis in USA" Facebook page to distribute the survey on my behalf. This page is an important social platform for US-based Saudi students (and former students), consisting of 253,753 followers (as of January 14, 2018), and thus offered access to a large potential sample of respondents. Participants were required to be Saudi nationals, to ensure that the respondents would be familiar with the dialect of interest. Participants who reported themselves as non-Saudi were ruled out. Participants had to be at least 18 years old. The respondents were asked to complete the survey individually to avoid any influence or shared information among respondents. Respondents participated voluntarily and were not compensated. Data was collected over 4 months, from October 2017 to January 2018. The demographics of the respondents are provided below.

4.4.7 Respondent Sample

Of the 382 respondents who participated, 195 did not finish the survey, two chose not to participate after reading the consent page, and two reported themselves as non-Saudi and were therefore excluded. Thus, the analyzed data were based on 183 responses from respondents from different regions of Saudi Arabia.

The overall age range of respondents was 18 to 46, with 38% aged 25 to 30 (see Table 13). Age is presented categorically in two groups, younger and older, to ease data interpretation. Younger respondents were 18 to 30, and older respondents were 31 to 46. I set the cut off post-hoc at the age of 30 to have an almost equal number of participants in each group.

Respondents were roughly evenly divided between younger and older respondents, with 52% younger (n = 95) and 48% older (n = 88). The data were not well distributed by gender, as male respondents (63%, n = 115) were nearly double the number of female respondents (36%, n = 65). Within female respondents, there were nearly proportionally twice as many younger women (66%, 43/65) as older women (34%, 22/65).

Table 13. Respondents by age group and gender.

Gender	Younger (18–30)	Older (31–46)	*N*
Female	43	22	65
Male	51	64	115
Not specified	1	2	3
Total	95	88	183

Regarding education (see Table 14), respondents tended to report having a bachelor's (33%, n = 61) or master's (33%, n = 60) as the highest degree attained. Respondents with a doctorate represented the next highest rate (25%, n = 45). These categories had a higher number of respondents than categories lower than a bachelor's. This strong skew toward participants with tertiary education was shaped by the participant pool being Saudis in the US, who mainly come from Saudi Arabia to pursue higher education in the US.

Respondents' region of origin (see Table 15) correlated strongly with their self-identified native dialects. Thus, respondents who grew up in the south represented the vast majority of southern dialect speakers (97%, 38/51). This was a systematic pattern across factors, with the highest rates of respondents for western (88%, 45/54), eastern (67%, 16/17), central (81%, 47/53), and northern (55%, 6/8) regions correlating with Hijazi, Eastern, Najdi, and Northern dialects, respectively. On the other hand, those who reported growing up in a region but claimed a dialect

different from that region's dialect could be attributed to the fact that people are associated with the dialect of their origins and not with where they have grown up. For instance, if someone is originally from the south and grew up in the central region, he or she would say the southern dialect was his or her dialect and not Najdi.[14]

Table 14. Respondents by education.

Education	*N*
< Bachelor's	17
Bachelor's	61
Master's	60
Doctorate	45
Total	183

Table 15. Respondents by region and native dialect.

	Native regional dialect					
Region of Origin	Southern	Hijazi	Eastern	Najdi	Northern	*N*
Southern	38			1		39
Western	2	45		4		51
Eastern	2	4	16	1	1	24
Central	6	3	1	47	1	58
Northern	3	2			6	11
Total	51	54	17	53	8	183

[14] This is a real example that describes the author as well as other Saudi speakers.

The abovementioned demographic information is used for a later analysis as indicators for attitudes toward the Jazani dialect. The following section lays out the results for the identification task, followed by the attitudinal rating task, and finally a discussion on the open-ended questions.

4.5 Results

4.5.1 Identification Task Results

The main purpose of the study was whether native speakers of other Saudi dialects could identify Jazani speakers from sociophonetic information alone. To address this question, respondents were asked to listen and identify the origin of the speaker and indicate his regional dialect by clicking it on the map.

The heatmaps in Figure 21, Figure 22, and Figure 23 show the majority of responses (red) were centered around Jazan and southwestern Saudi Arabia, suggesting respondents could identify the regional dialect (Jazan) of the speakers. However, there was variation in the identification task across speakers. All three speakers were mostly perceived as Jazanis, but the heatmaps suggested Speaker 3 was more often perceived as Jazani than Speakers 1 and 2.

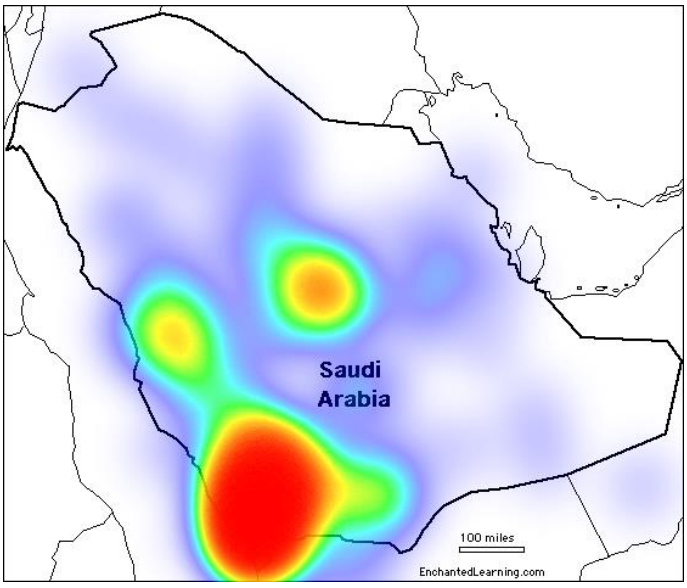


Figure 21. A heatmap for identification task for Speaker 1.

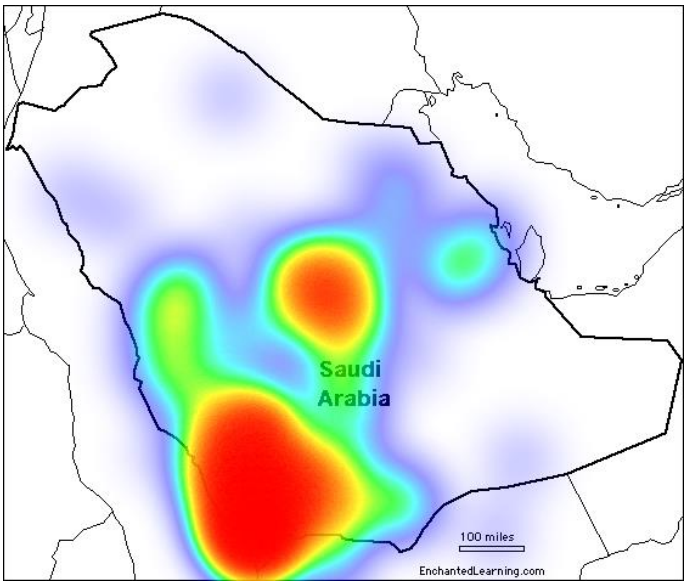


Figure 22. A heatmap for identification task for Speaker 2.

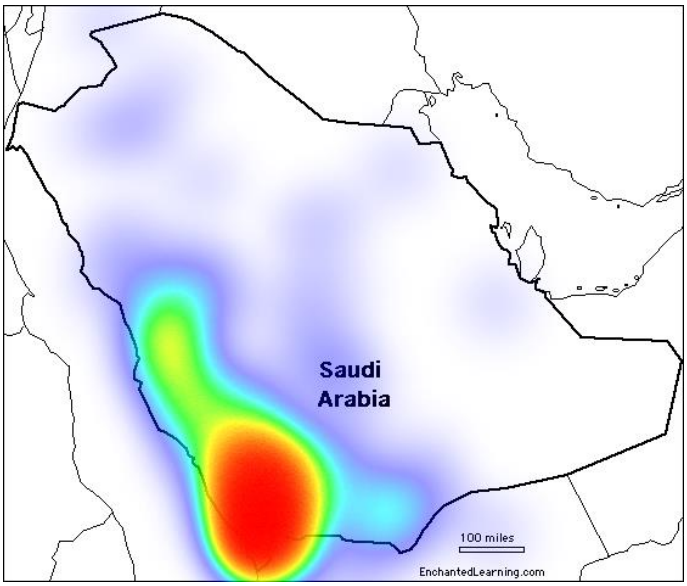


Figure 23. A heatmap for identification task for Speaker 3.

To confirm whether respondents could identify the speakers' regional dialect, after being presented with the audio stimuli and map, respondents were asked to write their answers in a text entry box. Responses were coded as "Jazan" if they specified the speaker's city (Jazan) and "Southern" if they wrote the southern region or mentioned other southern cities. The same method applies to responses for the central, eastern, northern, and western regions (see Figure 24).

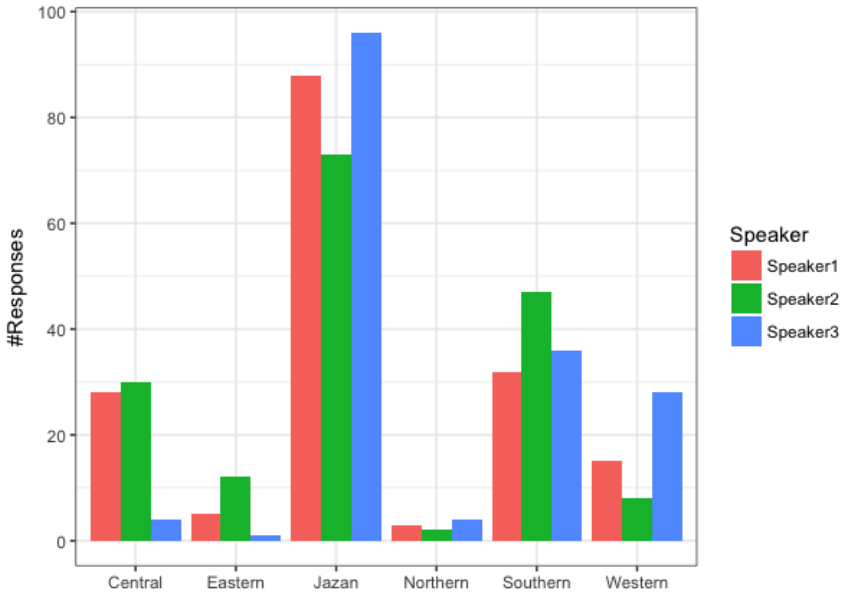


Figure 24. Perceived regional dialect for each speaker.

The distribution in Figure 24 shows that overall, Saudi speakers could identify the three speakers as coming from Jazan. Unsurprisingly, the second highest number of responses was for the southern region,[15] and the rest were distributed to other regions. However, there was variation in the identification task across speakers. Speaker 3 was most frequently identified as a Jazani speaker, followed by Speaker 1 and then Speaker 2, who was identified the least often as a Jazani speaker. Although all three speakers were Jazanis, this variation could be attributed to a sociophonetic feature that was perceived in one speaker's speech more than the other two, which is discussed in Section 0.

Since the goal was to determine whether Saudi speakers could identify the speakers as Jazanis, the data were collapsed and narrowed to two categories. Responses that indicated "Jazan"

[15] Respondents likely knew the speaker was Jazani but wrote down southern. This is because I asked respondents to identify the speakers' region or city of origin. A similar problem was encountered by Boughton (2006), who attributed the failure of more than half the respondents to identify the speakers' regions of origin to most respondents answering the question by naming a city or region, whereas the researcher asked them to identify the region, not the city.

were coded “Jazan” / “1” and those that indicated other regional dialects were coded “Others” / “0” for the purpose of a visual inspection and to facilitate the statistical analysis. To get a broader sense of the data after the recoding, I checked the data visually using a bar plot (see Figure 25).

The distribution in Figure 25 shows that overall, the speakers were identified as coming from Jazan only about half the time or less. A visual inspection showed variation in the identification of the three speakers. Speaker 3 was identified as a Jazani speaker 52% of the time (96/183), Speaker 1 48% of the time (87/183), and Speaker 2 40% of the time (73/183). Speakers 1 and 2 were more often identified as speaking other dialects and less often as Jazanis. In contrast, Speaker 3 was more likely perceived as speaking Jazani than another dialect.

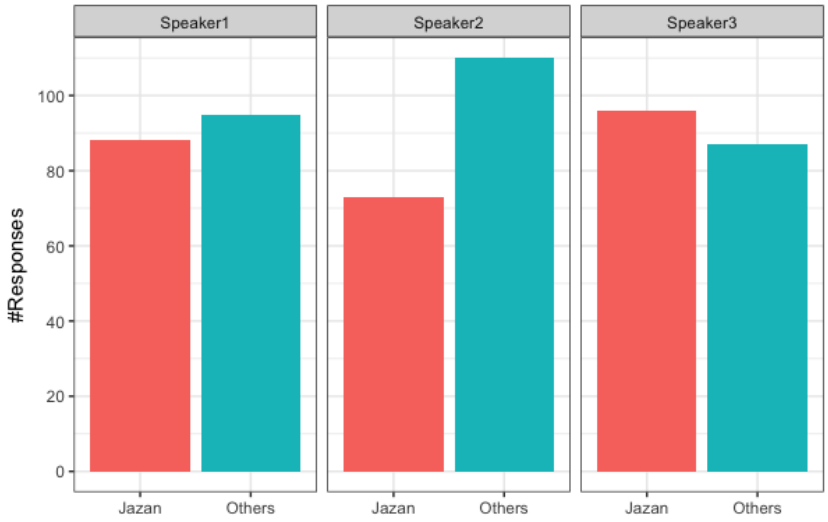


Figure 25. Perceived regional dialect for each speaker (Jazan vs. Others).

To thoroughly inspect the different responses to the identification task among the speakers, I conducted a one-way repeated measure ANOVA. The ANOVA, at $p = 0.05$, showed a statistically significant difference in the identification task across the three speakers, $F(2,364) = 8.98$, $p < 0.001$, $\eta_2 = 0.02$. Thus, the null hypothesis that there is no difference among the speakers was rejected, and a post-hoc test was carried out to locate the difference between the speakers.

A pair-wise Bonferroni *t*-test showed no significant difference between Speakers 1 and 2, $t(182) = -0.34$, $p > 0.05$, suggesting these speakers were perceived similarly. A second *t*-test showed a significant difference between Speakers 1 and 3, $t(182) = -3.66$, $p < 0.001$, indicating respondents perceived them differently. A third *t*-test showed a significant difference between Speakers 2 and 3, $t(182) = -3.37$, $p < 0.001$, indicating respondents perceived them differently.

This variation could be related to sociophonetic features associated with each speaker, especially /r/. Speakers 1 and 2 used the emphatic [rˤ] as the primary allophone, whereas Speaker 3 only used the non-emphatic [r] and no allophone. This could explain why Speaker 3 was perceived differently from the others and why he was most often identified as a Jazani speaker. This may indicate two things: 1) respondents truly relied on sociophonetic features alone to identify the speaker as Jazani, and 2) respondents considered non-emphatic /r/ as a salient sociophonetic feature of JA speech.

The identification task showed that the respondents could generally identify the speakers' regional dialect based on sociophonetic features alone. However, there was variation in the identification of the three speakers, which could be attributed to sociophonetic features associated with one speaker more than the others. Knowing that Saudi speakers can identify JA speakers is important, but what is more important is knowing their attitudes toward JA and the effect of their social factors on how Jazani speakers were perceived.

4.5.2 Attitudinal Rating Task

After respondents listened to the audio stimuli and identified the speakers' regions of origin in the identification task, they were asked to rate the speakers based on five characteristics on a semantic differential scale from 1 "most negative" to 6 "most positive." These characteristics were *friendly*, *smart*, *fast*, *pleasant*, and *educated*. The rating-scale analysis was performed in the

following steps. First, I made a descriptive analysis of attitudes toward Jazani speakers, presenting visual inspections through bar plots for all rating scales across speakers, followed by a series of linear mixed effect models, in which I examined the effect of social factors, such as respondents' dialect, age, and gender, on attitudes about the speakers. The following section compares all rating scales across all speakers.

4.5.2.1 Rating Scales Across All Speakers

For this task, the data were collapsed from five groups—respondents' dialects: Southern, Najdi, Western, Eastern, and Northern—to three groups: Southern, Najdi, and Others (which included Western, Eastern, and Northern). This was done deliberately to focus on interpreting the results of the focus group, Southerners, and the reference point group, Najdis, treating Others as a control group. Najdis were not included in Others to compare previous results of Najdis' attitudes to Saudi dialects from (Alrumaih, 2002) to the results of the dissertation. I compared all rating scales across all three speakers to understand how Saudi speakers perceived Jazani speakers on the scales for *friendly*, *smart*, *fast*, *pleasant,* and *educated*.

Figure 26 shows the five characteristics on the x-axis and the mean of the rating scales on the y-axis. A higher bar indicates a more positive attitude, and a lower bar indicates a more negative attitude. A visual inspection revealed that Saudi speakers perceived Jazani speakers as primarily *friendly*, while *educated* was the lowest rated characteristic, which supports hypothesis (d). *Smart* had more positive attitudes, followed by *fast*, and then *pleasant*. To better understand the differences between these characteristics, Table 16 presents a descriptive analysis with means and standard deviations.

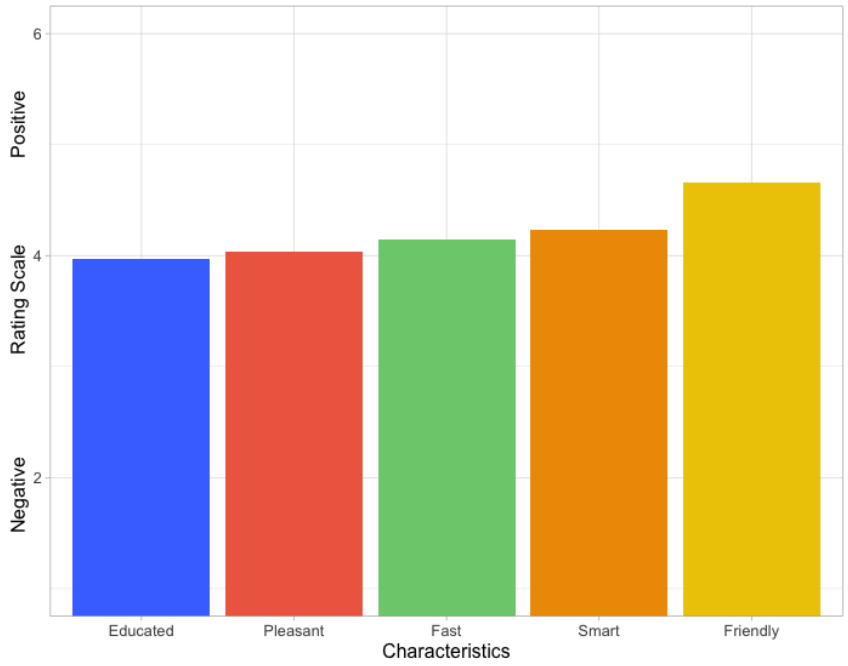


Figure 26. Bar plot displaying mean values for each characteristic.

Table 16. Means and SD values of each characteristic.

Trait	*M*	*SD*
Educated	3.77	1.21
Pleasant	3.94	1.25
Fast	4.01	1.20
Smart	4.08	1.08
Friendly	4.53	1.05

Table 16 illustrates that all characteristics have relatively close means and almost identical standard deviations, indicating that respondents perceived Jazani speakers similarly on these tested scales. This observation slightly corresponds with hypothesis (c), in which I expected neutral attitudes across the scales. More important to the study was how the social profiles of respondents may have affected their attitudes toward Jazani speakers. Therefore, the following section

discusses each of the five characteristics with respect to the social factors separately and their possible influence on respondent attitudes.

4.5.2.2 Effect of Social Factors on Attitudes

I ran a series of linear mixed-effects regression models (total of 15 models), to examine the effects of three social factors—respondents' dialect, age, and gender—on the five dependent characteristics ratings (*educated*, *pleasant*, *fast*, *smart*, and *friendly*). The models always included rating values for one of the following as the dependent variable: *educated*, *pleasant*, *fast*, *smart*, and *friendly*. They all, except the null model, included either one, two, or three fixed effects; *Respondents dialects* (Southern, Najdi, Others), *Age* (Younger, Older), and *Gender* (Female, Male, Not specified), without or with two- or three-way interaction (see APPENDIX H). In the models presented below, Najdis, Older, and Female were always the intercepts/baseline. The linear models included random intercepts for respondents to account for any variability introduced by any respondent due to making judgments repeatedly for three speakers. I only present the best fit model, which showed the lowest AIC = Akaike Information Criterion (Akaike, 2011). Below, I present the best five models, one for each of the five dependent variables/characteristics mentioned above.

4.5.2.2.1 Educated Rating Scale

Figure 27 exhibits the respondents' dialects on the x-axis and the mean rating value for the educated scale on the y-axis. The visual inspection showed that Najdi speakers perceived Jazani speakers as less *educated* than Southerners –and to a lesser extent Others—did.

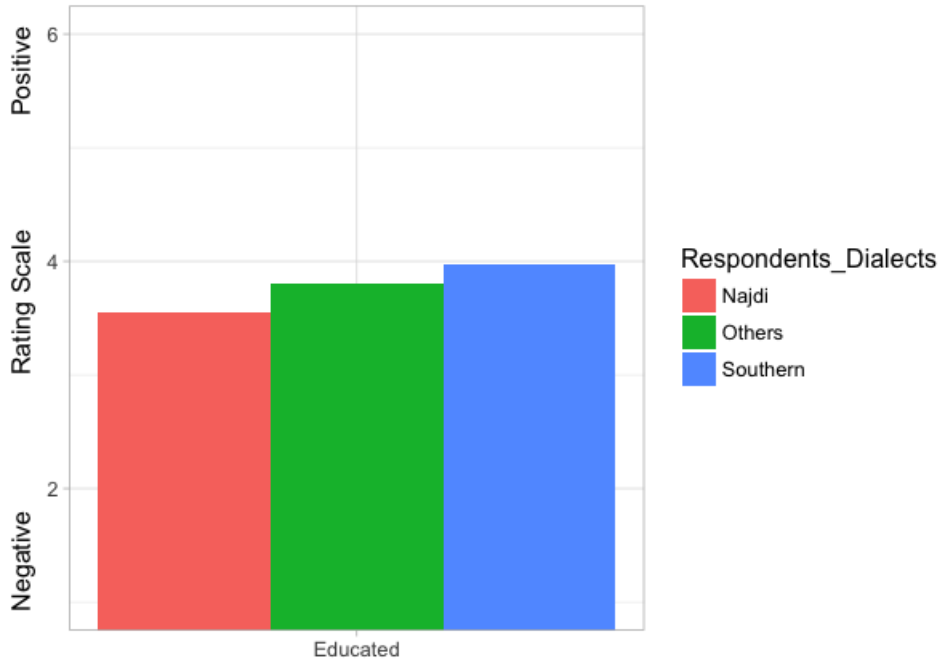


Figure 27. Educated rating scale by respondent regional dialect.

This is confirmed by the regression analysis in Table 17. Further statistical analysis was performed to reveal whether there was any significant effect from the social factors. Fitting different models to the data, the best fit model included a separate fixed effect of Respondent dialect, presented in Table 17.

Table 17. Linear mixed effects model for regional dialect and educated rating scale.

	Estimate	Std. Error	df	*t*	Pr(>|t|)
(Intercept)	3.54	0.11	180	31.84	<0.001
Others	0.26	0.14	180	1.82	<0.1
Southern	0.42	0.15	180	2.68	<0.01

According to the mixed effects regression analysis, the results showed a statistically significant effect of *regional dialect* on attitudes about Jazani speakers on the *educated* rating scale, showing an estimate increase from the Najdi speakers to the Southern speakers. This effect confirms the trend identified by visual inspection, indicating that Najdi speakers, with the lowest

mean and estimate, perceived Jazani speakers with more negative attitudes than Southern speakers did. Negative attitudes by Najdi speakers are expected in hypothesis (g, i), since Najdis, as assumed, are speakers of a prestigious variety and therefore are linguistically secure.

4.5.2.2.2 Pleasant Rating Scale

For the characteristic *pleasant (to listen to),* after fitting different full models to the data, the null model is the best fit model, which is presented in Table 18.

Table 18. Linear mixed effects model for null model and pleasant rating scale.

	Estimate	Std. Error	df	*t*	Pr(>|t|)
(Intercept)	3.94	0.06	182	59.4	<0.001

That indicates that none of the predictors had a significant effect or interaction on the rating values for the *pleasant* scale. In other words, this could indicate that respondents with different dialects, age, and gender have similar perceptions or attitudes of JA speakers on the *pleasant* scale.

4.5.2.2.3 Fast Rating Scale

From the three main (fixed) effects and models with interactions, *age* is the best indicator in all fitted models for the *fast* scale, presented in Table 19.

Table 19. Linear mixed effects model for age and fast rating scale.

	Estimate	Std. Error	df	*t*	Pr(>|t|)
(Intercept)	4.12	0.08	181	46.92	<0.001
Young	-0.20	0.12	181	-1.65	<0.1

This confirms and aligns with the visual inspection of the results for the *fast* characteristic which revealed that only respondent age appeared to affect the ratings. Figure 28 exhibits the age groups on the x-axis and the mean rating value for the *fast* scale on the y-axis. Older respondents perceived Jazani speakers to have *fast* speech slightly more often than younger respondents. That

is to say, attitudes toward Jazani speakers on the fast rating scale decreased from the older group to the younger group. This is borne out by the regression analysis below, showing a significant difference between the age groups with the rating values for *fast*.

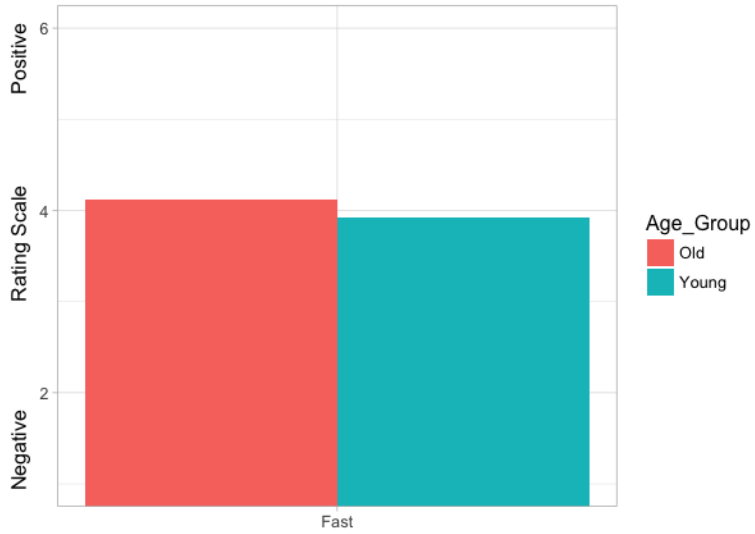


Figure 28. Fast rating scale by age group.

This attitude pattern was expected to be observed with respect to the different respondents' dialects but it turns out that *age* was more relevant. However, this finding is not surprising and can be interpreted because younger adults have been found to speak faster than older adults (Jacewicz et al., 2009). Therefore, based on that, I argue that younger adults perceived JA speakers to be not as *fast* as older listeners perceived them to be.

4.5.2.2.4 Smart Rating Scale

Among the three fixed effects, regional dialect is the best indicator for the *smart* scale. Figure 29 shows that Southern speakers more often perceived Jazani speakers as *smart*, while Najdi speakers were least likely to perceive them as smart. Overall, the rating scale for *smart* was not toward the negative or positive extremes, and the differences by dialect appeared small between Southern speakers and speakers of other dialects, although there was a larger difference between Southern and Najdi speakers.

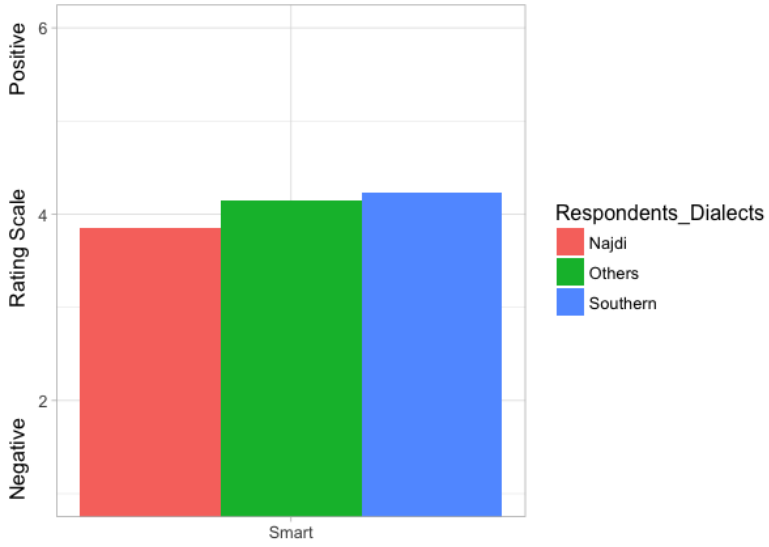


Figure 29. Smart rating scale by respondent regional dialect.

A linear mixed effect regression analysis was performed to determine if there was a significant effect from any of the social factors. Fitting different models to the data, the best fit model is presented in Table 20.

Table 20. Linear mixed effects model for regional dialect and smart rating scale.

	Estimate	Std. Error	df	*t*	Pr(>|t|)
(Intercept)	3.84	0.11	180	34.87	<0.001
Others	0.29	0.14	180	2.09	<0.05
Southern	0.37	0.15	180	2.40	<0.05

The best model included the rating values for the smart scale as the dependent variable and the respondents' dialects as the fixed effects, with a random intercept of respondent. According to the mixed effects regression analysis, the results showed a statistically significant effect of respondent regional dialect from all dialect groups on attitudes about Jazani speakers on the *smart* rating scale. However, the effect varied from one group to another. The model shows an estimate increase from Southern and Others speakers to Najdi speakers, indicating a larger effect by Najdis.

This supported the previous visual interpretation indicating that Najdi speakers, with the lowest mean and estimate, perceived Jazani speakers with more negative attitudes, i.e. as less smart, than Southern speakers did. It also supported hypothesis (g, I), in which I expected Najdi speakers to perceive JA speaker negatively due to their linguistic security. In contrast, Southerners exhibited in-group loyalty, rating the JA speakers as significantly smarter than the Najdi respondents did, which supports hypothesis (g, II).

4.5.2.2.5 Friendly Rating Scale

Again, regional dialect turns out to be the best indicator for the *friendly* scale. Figure 30 shows that speakers of other dialects and Southern speakers more often perceived Jazani speakers as *friendly*, while Najdi speakers were less likely to describe them as *friendly*. Surprisingly, speakers of other dialects showed a slightly more positive attitude than Southern speakers. This is confirmed by the regression analysis below.

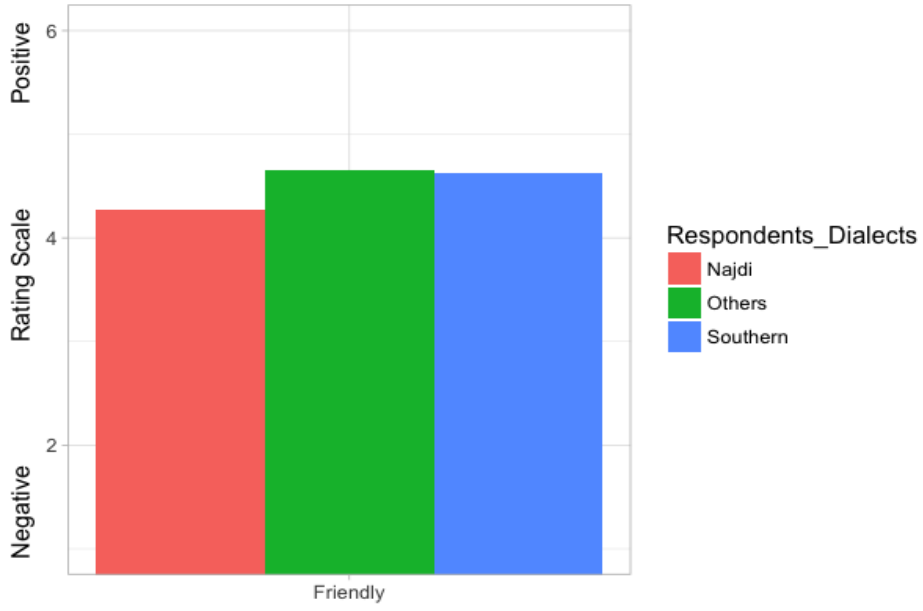


Figure 30. Friendly rating scale by respondent regional dialect.

The best linear mixed regression model had the rating values for the *friendly* scale as the dependent variable, the respondents' dialects as the fixed effect, and respondent as random effects.

Table 21 shows a significant effect from respondent regional dialect on the *friendly* rating scale for the Najdi speakers, a smaller significant effect for speakers of other dialects, and no effect for Southern speakers.

Table 21. Linear mixed effects model for regional dialect and friendly rating scale.

	Estimate	Std. Error	df	*t*	Pr(>|t|)
(Intercept)	4.27	0.12	180	34.28	<0.001
Others	0.37	0.16	180	2.33	<0.05
Southern	0.34	0.17	180	1.93	0.1

The statistical analysis aligns with the visual interpretation above, indicating that Najdi speakers, with the lowest mean and estimate, perceived Jazani speakers with more negative attitudes than speakers of other dialects (including Southern respondents) did. Again, hypothesis (g, i) is borne out, but hypothesis (g, ii) is not. That Southerners considered themselves less friendly than Others, thereby showing linguistic insecurity, is not surprising, since a similar pattern, but with correctness, is observed in previous studies, as with residents of southern Indiana who rated other states higher than themselves in correctness (Preston, 1993b).

Overall, there are significant effects from respondents' dialects on attitudes toward Jazani speakers on some characteristics more than any other social factors. Najdi respondents are more critical, as reflected in their more negative attitudes to the JA speakers, whereas Southerners are more lenient, showing more positive attitudes to JA. Specifically, Najdi respondents perceive Jazani speakers with more negative attitudes than Southern dialects and speakers of other dialects on the *educated*, *smart*, and *friendly* scales. These results confirm the notion that the dialect situation is socially stratified and so it is reflected with the different attitudes associated with different dialects that represent different social groups. Some of these results, specifically those

for Najdi respondents, correspond with findings from (Alrumaih, 2002). With respect to the other respondent factors. the only effect by age was for the *fast* scale, showing that older respondents perceived Jazani speakers to have fast speech slightly more often than younger respondents. However, there is no effect of gender on any attitudes toward JA. Furthermore, in all full models, there are no two-way or three-way interaction for the social factors. These results indicate that gender and, to a lesser extent, age don't contribute to attitudes toward JA.

Now that we discovered the effect of social factors on attitudes in scaled and quantitative questions, we turn to discuss non-scaled qualitative questions to reveal the Saudi speakers' attitudes to JA.

4.5.3 Qualitative Attitude Responses

4.5.3.1 Data Analysis

The purpose of analyzing the qualitative comments was to establish and convert beliefs, stereotypes, and social evaluations into general patterns about JA. I followed a content analytic procedure to group the responses. First, I looked at the qualitative answers for the questions in Section 4.4.5 above and recorded what was relevant, common, and salient. To quantify the qualitative answers, modeling after Garrett et al. (2005), I assigned respondents' answers to one of eight categories: linguistic features, affective (positive affective and negative affective), status and social norms (cultured and uncultured), cultural association, comparison, and domestic comparison. These categories are explained one by one below.

Category 1 is linguistic features. This category contains general comments that addressed broad linguistic qualities about the three JA speakers' pronunciation. Here I quote some: "different pronunciation," "he said it in a weird way." Other comments were about speech rate, such as "he speaks so fast." Some linguistic comments were very specific and addressed segments, such as

non-emphatic /r/, /g/, /dʒ/, and vowels like [o], while others addressed a process, such as word-initial consonant sequences or final consonant deletion. Other comments were related to the lexis level, where respondents referred to a specific word, indicating a different pronunciation or usage of different word, such as [mobarah] "match" and [wɪʃ] "how about?"[16]

Category 2. is affective positive. This category contains positive comments that addressed speakers' speech. Affective positive included comments such as "friendly," "pleasant," "beautiful dialect," "exciting," and "I like it."

Category 3 is affective negative. This category contains negative comments that addressed speakers' speech. Affective negative included comments such as "unpleasant," "annoying," and "harsh."

Category 4 is cultured. Comments in this category refer to correctness, education, and social status associated with JA. Cultured attitudes included comments such as "well-spoken," "fluent," "articulate," "smart," and "educated."

Category 5 is uncultured. Likewise, comments in this category refer to correctness, education, and social status associated with JA. Uncultured attitudes included comments such as "incorrect," "non-fluent," and "perverted dialect."

Category 6 is cultural associations. Responses in this category include things symbolically related to Jazani culture. Some of the responses focused on the nature of Jazan, such as "mountains," "jasmine," and "mango," which Jazan is known for, while others focused on the typical costume of Jazani people, consisting of a *wizrah* (similar to a skirt), blouse, and a headband

[16] To point out a different pronunciation, respondents resorted to writing words that were perceived with different pronunciation as in the case with [mobarah] "match," and [ʕɪndoh] 'at his/he has". To focus on eliciting sociophonetic features of Jazani, salient lexis of JA such as [maho] "what?/how about" was deliberately avoided, as they can draw respondents attentions, and replaced with the word [wɪʃ] wich is used in other Saudi dialects. As respondents identified the speakers as Jazanis, some of them pointed out to the word [wɪʃ] and wondered why the speakers did not use [maho].

of basil and flowers. Mohammed Abdu, a famous Jazani singer, was mentioned to indicate what came to mind when thinking of Jazani speakers.

Category 7 is comparison. This category contains comparisons with non-Saudi Arabic varieties, such as Yemeni, Emirati, and Omani Arabic. Typical comments coded into this category included "He sounded like an Omani speaker," "He seemed to have a heavy Yemeni accent," "He pronounced X word as an Emirati does," and "He is influenced by X dialect." An important coding decision was to exclude comments related to Saudi dialects from this category, and to put them into *domestic comparison* instead.

Category 8 is domestic comparison. This category includes comments comparing JA to other Saudi dialects, such as Hijazi, Asiri, Eastern, Qassimi, or Bedouin.

4.5.3.2 Results and Discussion

Table 22 gives an overall picture of the comments that were grouped into eight categories. Two overarching categories divide responses into implicit and explicit attitudes. Explicit attitudes were expressed in answer to the survey question, "What impression comes to mind when you think of JA speakers?" in which respondents were overtly directed to evaluate JA. Accordingly, percentages increased and decreased based on these two categories.

I calculated the number of comments for each category and added the total number of comments for each overarching category to get the percentages illustrated in Table 22. For example, of the 1,078 keywords given by respondents, 26% denoted linguistic features, and only 1% denoted association.

Table 22. Percentages of implicit and explicit attitude comments in each category.

Respondents (n = 183)	Items (n = 1,078)		Items (n = 284)	
Categories	Implicit		Explicit	
	%	N	%	N
Linguistic features	26%	285	48%	136
Affective positive	15%	161	8%	23
Affective negative	9%	98	5%	15
Cultured	23%	253	5%	13
Uncultured	11%	117	6%	16
Associations	1%	1	9%	25
Comparison	5%	54	15%	44
Domestic Comparison	10%	109	4%	12

4.5.3.2.1 Linguistic Features

The largest number of comments were coded as linguistic features. As shown in Table 22, these comments constituted 26% of all Implicit responses, more than any other category in implicit attitudes, increasing to 48% in the explicit attitudes category, again far higher than any other category. This finding suggests respondents relied heavily on linguistic (and in this case, especially phonetic) features in identifying and assessing Jazani speakers. As mentioned before, linguistic feature comments varied from general comments about pronunciation to specific features, such as segments, speech rate, and lexis.

First, I will present comments from the implicit attitudes. Unsurprisingly, word-initial consonant sequences in the stimuli drew considerable attention, which respondents also commented on. Respondent did not mention word-initial consonant sequences explicitly, but they

did mention a vowel or consonant was deleted, such as in [smaʕ] and [bkar], thus referring to word-initial consonant sequences indirectly. In fact, due to the presence of such linguistic features in JA, respondents considered Jazani speakers to have a *faster* speech rate than their own dialects.

Furthermore, in the implicit attitudes, the variable /r/ was a major salient feature mentioned across all three speakers. /r/ was referred to as "moraqqaqah," i.e. non-emphatic [r]. Interestingly, 88% of the time, non-emphatic [r] was associated with Speaker 3, 8% with Speaker 1, and only 4% with Speaker 2. This shows Speaker 3 had a salient production of /r/, providing evidence that /r/ is a strong predictor of the speakers' dialect and explaining why Speaker 3 was perceived as sounding the most Jazani. In this study, I relied on open-ended responses rather than giving options to choose from. On the one hand, this method is appropriate in an exploratory study to avoid limiting the answers and to gather as much information as possible. On the other hand, it does not guarantee respondents comment on everything they hear. Therefore, it is unclear whether there is actually variation in the production of /r/ in Jazani speech or if respondents decided to mention it once and only by chance did the comments more frequently pertain to Speaker 3.

Surprisingly, in the implicit attitudes, other comments brought up the /ħ/ and /dʒ/ segments. Some respondents thought southerners pronounced /ħ/ and /dʒ/ differently from non-southern Saudi dialects. One respondent referred to two words from the audio stimuli [rɪħna] "we went" and [madʒnunah] "crazy" to indicate these were pronounced with what he called " حاء و جيم أهل الجنوب" "Southerners' /ħ/ and /dʒ/." The same respondent attributed this to the Arabic grammatical term "kasrah," a high short vowel that precedes or follows /ħ/. This attribution supports my coming claim in the following paragraph about the "sharpness of /g/." Initially, I can conclude that vowels are a trigger in perceiving these segments as salient in JA. It is unclear whether this attribution applies to /dʒ/. Another explanation is that /dʒ/ is susceptible to change and therefore realized as

/ʒ/, as in the case of Hijazi Arabic (Omar & Nydell, 1975). However, this is only speculation and requires further phonetic analysis, which is beyond the scope of the study.

Also, in the implicit attitudes, the [o] in a single word in the audio stimuli, [ʕɪndoh] "at his/ he has," was another indicator of JA for some respondents. However, it caused other respondents to think the speakers were Najdi speakers, namely Qassimis. This is not surprising, since Qassimi Arabic uses the same vowel and thus the same pronunciation of the word, unlike other Saudi dialects in which the word [ʕɪndoh] is realized as [ʕɪndah] with [a]. Although this vowel was an indicator of JA, from my linguistic experience, this feature is more associated by laypeople with Qassimi Arabic.

In the explicit attitudes, comments included other linguistic features, namely segments such as /g/. One respondent commented "Jazani speakers have their own way of pronouncing /g/," and one elaborated that /g/ in Jazani speech is pronounced with "sharpness." The stimuli contained no instances of /g/. Rather, respondents commented on this feature based on their previous experience and perceptions of JA. These comments occurred only in response to explicit attitudes question, "What are some salient linguistic features pronounced differently in JA?" What respondents referred to as a sharpness of /g/ might be attributed to the vowel following /g/. I speculate that /g/ sounds "sharp" when followed by [ɪ] in a word like [gɪdim] "old." However, further phonetic analysis is needed, which is beyond the scope of this study. Other respondents overgeneralized Yemeni Arabic's use of /g/ instead of /dʒ/ to JA, which is not the case. For example, in JA, "stones" is realized as [ħadʒar], whereas it is [ħagar] in Yemeni Arabic.

In terms of lexis and morphemes, the definite article [ʔam] "the" and the word [maho] "how about?" were deliberately not included in the audio stimuli. Nevertheless, [maho] was commented on in the implicit and explicit attitudes, whereas [ʔam] was only brought up by the

respondents in the explicit attitudes, indicating they are well-known linguistic features associated with JA.

With respect to phonetic cues, a few respondents considered nasality a feature of JA. Some mentioned Jazani speakers had "thin voices," probably meaning they had high-pitched voices, while others found JA had a different rhythm, possibly an attempt to say that it has different intonation and stress patterns. Such comments were obtained in both implicit and explicit attitudes.

4.5.3.2.2 Affective Categories

Table 22 shows a systematic pattern of higher percentages for positive (15%) and negative (9%) affective comments in the implicit attitudes category and lower percentages for positive (8%) and negative (5%) affective comments in the explicit attitudes category. This suggests respondents felt freer to express their attitudes when they were unaware of the dialect they were judging and were more sensitive when they knew which dialect it was. This would explain why there are more comments overall in the implicit attitudes column in Table 22 (over a thousand) and fewer in the explicit attitudes column (just 284). This was supported by some comments from respondents, such as "I think it's a shame to criticize people's dialects" and "All dialects on the eye and head," meaning all dialects are respected.

Respondents also made numerous other comments to evaluate Jazani speakers positively and negatively. For example, positive affective comments included "friendly," "simplicity," "calm," and "pleasant," while negative affective comments included "annoying," "weird," "underestimated," and "harsh."

4.5.3.2.3 Culture

Table 22 shows that positive culture comments drew the second largest proportion (23%) in the implicit attitudes category, but this proportion dramatically decreased to 5% in the explicit

attitudes category. This is consistent with the pattern attested in affective comments, in which comments in the explicit attitudes decreased. Again, this supports the idea that respondents appeared sensitive about criticizing and judging specific dialects, especially when they were named. Examples of positive culture comments included “social,” “confident,” “smart,” and “comprehensible.” Along the same lines, negative culture comments were higher (11%) in the implicit attitudes and lower (6%) in the explicit attitudes. Negative comments included “careless,” “uneducated,” “influent,” and “stupid.”

4.5.3.2.4 Cultural Associations

Cultural associations received the lowest percentage (1%) of any category in implicit attitudes. However, unlike affective and culture comments, cultural association comments increased in explicit attitudes to 6%. This was unsurprising since being made aware of the cultural context of the speakers would make respondents more likely to make cultural comments. As previously mentioned, responses in this category focused on things symbolically associated with Jazani culture, such as “mountains,” “jasmine,” and “mango,” which Jazan is known for, or the typical costume of Jazani people, consisting of a *wizrah* (similar to a skirt), blouse, and a headband of basil and flowers. Other comments were associated with names like Abdu, a typical name of a Jazani person. In that vein, Mohammed Abdu, a famous Jazani singer, was mentioned to indicate how symbolic he is to Jazan and comes to mind when thinking of Jazani speaker.

4.5.3.2.5 Comparison

In response to the qualitative questions, comparisons were always brought up. Although comparisons like “Emirati” and “Omani” were present, they were only reported once or twice, with the main focus on “Yemeni.” Comments such as “He sounded like a Yemeni speaker,” “He seemed to have a Yemeni accent,” “He pronounced X word in a Yemeni way,” and “He is

influenced by the Yemeni dialect" were coded into this category and quantified to see which speaker was associated more frequently with Yemeni Arabic. Yemeni Arabic was referenced 106 times; of these, "Yemen" was mentioned 60 times, and the other 46 comments were in response to the explicit question about JA. Speaker 3, most often identified as a Jazani speaker, was associated more frequently with Yemeni Arabic, with 50% of the Yemen comments (n = 30) referring to him. Speaker 2 was the second likeliest speaker to be associated with Yemeni (30%, n = 18), and Speaker 1 was the least likely (20%, n = 12). This went against the initial expectation, since Speaker 1 was identified as a Jazani speaker 48% of the time, more than Speaker 2, who was identified as such only 40% of the time. This may indicate another factor played a role in this comparison.

4.5.3.2.6 Socio-Economic and Occupational Status

The expectation was that Jazani speakers would be associated with low-income jobs, such as security, soldiers, and cashiers. One question was asked for each speaker regarding what respondents thought about the speaker's social status, education level, and occupation. Respondents usually only answered one part of the question and forgot the other parts. Thus, there were few responses addressing the socio-economic status and education of the speakers.

Regarding speaker occupation, the vast majority of responses guessed "student." This could be attributed to the topic, which indicated the speakers were young and interested in watching soccer matches, making respondents think of students. Some respondents guessed the speakers' occupation type, while others just reported "employee." Thus, not all occupation comments were important, because "employee" does not give a specific occupation. Below, I highlight the relevant comments, especially jobs tied to stereotypes about Jazani people and that have a low socio-economic status.

The respondents thought Speaker 1 sounded more "academic" and he was called a teacher 9% of the time (n = 16), more often than Speaker 2 (3%) or Speaker 3 (2%). Comparing Speakers 1 and 3, this was understandable since Speaker 3 was perceived as the most Jazani speaker and therefore less likely to be associated with academic jobs. However, it was the opposite with Speakers 1 and 2 since Speaker 1 was perceived to be more Jazani than Speaker 2 and thus was expected to be less associated with academic jobs than Speaker 2; however, the opposite was the case. This could follow from changing stereotypes about Jazanis. That is, the old stereotype visualizes Jazanis as uneducated, while a new stereotype represents them as strict, hardworking, and educated. This perception was apparent in two comments: "To my knowledge, Jazanis are known for their keenness to get the highest degrees" and "What comes to my mind is that Jazan is a city of culture and knowledge," regarding this respondent's first impression. Thus, this new way of looking at Jazan and Jazanis may have led to this discrepancy in the results. If the old stereotypes about Jazanis are changing, more research is needed on new cultural stereotypes about them.

Although the numbers reported for other occupations were not high enough for meaningful statistical analysis, the job types associated with each speaker may show how the speakers were conceptualized. What is important here is to focus on occupations with a low income, such as salesman, cashier, security guard, soldier, mechanic, and animal breeder. In these low-income jobs, only Speaker 3, who was perceived as a Jazani speaker more frequently, was described by various respondents to belong to all of them. Among the low-income jobs, salesman, handicraft, mechanic, and breeder jobs are considered to have the lowest income. Speaker 3 was thought of as a "grocery and vegetable salesman" 3% of the time, more than Speaker 1 (1%), while Speaker 2 was never thought of as a salesman. Speaker 3 was conceptualized more to have a handicraft job (2%) than Speaker 1 (1%) or Speaker 2 (1%). In addition, Speaker 3 was the only one conceptualized as a

mechanic or animal breeder (1%). This may explain why Speaker 3 was less likely perceived as a soldier (2%) than Speaker 2 (3%). That is, respondents thought of Speaker 3 as having jobs at a lower income than a soldier. These low-income jobs do not require speaking skills or speaking to an audience. This would explain such comments as "a job has nothing to do with speaking or delivering a speech" and "I can't know his job from this recording; however, I can exclude some jobs. Therefore, I think he is not an educated or specialized person, and so I don't think he is an academic or a teacher or relating to jobs that require education." These comments show some respondents held negative attitudes about the speakers' dialect, informing their opinions about what occupations should correspond to that dialect.

To sum up, in the identification task, respondents showed that they could generally identify the speakers' regional dialect as Jazan or Southern based on sociophonetic features alone, relying on sociophonetic features such as /r/ and word-initial consonant sequences. With respect to the scaled attitudes, results yielded a significant effect of respondents' dialects and age, but no effect of gender on attitudes toward JA. Respondents pointed out sociophonetic features associated with JA such as /r/ and word-initial consonant sequences, as well as [ʔam]. Cultural association comments were symbolic and iconic representations of Jazani culture and public figures. In Chapter 5, I review the aim and findings of the dissertation and discuss limitations and further directions.

CHAPTER 5. CONCLUSION

5.1 Introduction

One of the main goals of this dissertation has been to shed light on Jazani Arabic. As discussed in Chapter 1, this dialect of Arabic has been little studied by linguists in general, and rarely by phonologists and sociolinguists. Yet, JA has a lot to offer in terms of phonological, sociolinguistic, as well as morphological and syntactic analyses. In this final chapter, I first provide a summary of the findings on the syllabic organization of word-initial consonant sequences in JA presented in Chapter 3. I then provide a summary of findings on attitudes toward JA from Chapter 4. Later, I discuss the dissertation contributions to phonology and sociolinguistics, followed by future directions of this dissertation.

5.2 An Overview of the Dissertation Results

One goal of this dissertation was to address the syllabic organization of word-initial consonant sequences in JA, i.e. determining whether they are simplex or complex onsets. Results of this dissertation showed that JA word-initial consonant sequences were simplex onsets rather than complex. In order to address this, I conducted a phonetic analysis, utilizing the correlation between the syllable structure organization and temporal coordination. To do this, first I constructed stimuli consisted of 78 real and nonce word, 39 pairs, for Experiment 1 and 16 real and nonce words, 8 pairs, for Experiment 2. Data was collected from 7 native JA speakers in both experiments. I measured the timing of the consonants in relation to the vowel; the left edge, the c-center point, and the right edge for each word, and speaker in the sample. Below, I summarize my findings, which align with findings from previous research that address the same question, but with different languages or varieties.

Experiment 1 results showed that JA word-initial consonant sequences were simplex onsets rather than complex. That is, the right edge interval, among all pairs and across all participants and

sonority profiles, had the lowest RSD values, and thus was the most stable interval compared to the left edge and c-center intervals. This pattern was consistent with the simplex onset organization hypothesis in Shaw et al.'s (2011) study of Moroccan Arabic, and Goldstein et al.'s (2007) study of Tashlhiyt Berber. I supplemented these findings with the results of Experiment 2, which confirms that word-initial consonant clusters in JA behaved as simplex rather than complex onsets, confirming the findings of Experiment 1. Furthermore, Experiment 2 provided evidence against the argument that the first consonant of word-initial consonant sequences is resyllabified with the preceding word, as words were tested in isolation. The results of the syllabification of word-initial consonant sequences are compatible with the syllabification of word-medial consonant sequences, meaning that consonant in both cases are syllabified in different syllables. However, in word-initial consonant sequences, the first consonant seems to function on its own as a nucleus or as an onset with empty nucleus. These results offer some new directions for investigation, which I discuss in Section 5.5.

Two other main goals of the dissertation were to discover the socially salient sociophonetic features of JA and Saudis' attitudes toward JA. Results of this dissertation showed that word-initial consonant sequences and /r/ are salient sociophonetic features of JA. With respect to attitudes, respondents' dialect and age showed an effect on attitudes toward JA. I conducted an online survey, employing an identification task, attitudes scaled questions, and open-ended questions. To construct this survey, first I created a Jazani script, which was recorded by 3 Jazani speakers. These recordings were presented in the survey. None of the recordings contained lexical, morphological or syntactic JA features. The respondents listened to each speaker and identified the speakers' region of origin, then rated each one of them on a 6-point semantic differential scale for five different social characteristics, such as *pleasant (to listen to)* and *smart*. Finally, respondents were

asked some open-ended questions about the speakers and about Jazani Arabic to elicit more informative data. Data came from 183 respondents from all different regions of Saudi Arabia.

Results of the identification task, regardless of the variation in identifying the speakers as Jazanis, showed that respondents could identify the region of origin (Jazan) of the speakers based on phonology/phonetics alone. Attitudes scaled questions results showed there are significant effects from respondents' dialects on attitudes toward Jazani speakers on the *educated*, *smart*, and *friendly* scales. Najdi respondents held more negative attitudes, whereas Southerners held more positive attitudes to JA. These results align with the idea that the Saudi society is socially stratified and so it is reflected in attitudes from different social groups toward other groups dialects/speech. Age of the respondent also exhibited an effect on the attitude toward JA speech rate, showing older respondents to perceive Jazani speakers to have fast speech more than what younger respondents think. Gender of the respondent has no influence on attitudes toward JA. An analysis of the responses to qualitive questions showed that respondents can point out linguistic and importantly sociophonetic features of JA. Comments on linguistic features were proportionally the most frequent, indicating that respondents relied heavily on phonetic features in identifying and assessing Jazani speakers. Comments revealed many linguistics features, but mainly /r/, word-initial consonant sequences, and [ʔam] (which was not present in the script, but is a well-known feature of JA) were pointed out. Respondents seemed to be sensitive in showing their attitudes, feeling free to express their implicit attitudes but not their explicit attitudes. Cultural association comments were symbolic and iconic representations of Jazani culture and public figures, such as Mohammed Abdu. Results of open-ended questions proved previous anecdotally observations, such as sounding like Yemeni speakers. Further, it turned out that the comparison with Yemeni speakers is derived from respondents' perception of the phonetics of the audio stimuli, rather than

merely from people's knowledge of Yemen's geographic proximity to southern Saudi Arabia, as assumed in previous research (Aldosaree, 2016; Alrumaih, 2002). With respect to socio-economic and occupational status, it is expected that Jazani speakers would be associated with low-income jobs, which is borne out by respondents' comments such salesman, cashier, security guard, mechanic, and animal breeder. In the remaining sections, I discuss methodological considerations and contributions of this dissertation, followed by a discussion about possible avenues for future work.

5.3 Methodological Considerations

I would refine some aspects of this research if I were given the chance to conduct it again. I address some of these issues below, hoping future work will take them into consideration.

5.3.1 Stimuli Construction

Although it might not be the norm, the production experiments, especially Experiment 1, which investigated the syllable structure of word-initial consonant sequences could have benefited more from unrelated topic sentences, rather than carrier phrases. This could steer participants' attention away from target words, which can allow us to test whether the first consonants in those sequences resyllabify as codas of the preceding syllables.

The variation in identifying the speakers' region of origin (Section 4.5.1) could be resulting from the audio samples. When the stimuli were created, the speakers had to read a script from a piece of paper, something which might have affected how natural/unnatural and formal/informal the speakers sounded in the stimuli. Therefore, future work should consider an alternative way e.g. narrating the story after being familiar with the script.

5.3.2 Qualitive vs. Quantitative Questions

There is no doubt that the dissertation benefited from both qualitive and quantitative types of questions. Also, because of the nature of the dissertation, there are exploratory questions for which I indeed need to elicit information from respondents, therefore there were text entry questions. Answers to these questions were valuable but at the same time the qualitative analysis was a massive undertaking, and in Arabic, which also needed to be coded. Working with responses in English would have been direct and easier than responses in Arabic, because software programs such as *Excel* and *R* don't properly read or work with Arabic scripts. Coding of these answers took hours and hours to be ready for analysis. However, after this exploratory investigation and initial effort to collect qualitative data, the analysis can be used to construct more targeted (and restrictive) questions such as multiple answers, choose from the list that applies, or drop-down menu etc. that will be less time-consuming to analyze in future research.

5.4 Contributions of the Dissertation

One goal of this dissertation was to understand the behavior of the consonant sequences word-initially in JA. The dissertation has fulfilled that by providing phonetic analyses with some suggestions for a phonological analysis. It contributes to a growing body of research on phonology by expanding this line of inquiry to another understudied Arabic variety which exhibits a temporal pattern similar to that of Moroccan Arabic and Tashlhiyt Berber rather than English and Georgian. Results of the dissertation support the effectiveness of the acoustic measurements as a tool to understand syllabic organization. Thus, I anticipate that the acoustic measurements will lead to an expansion in studying more languages and dialects' syllable structure due to its accessibility, compared to the articulatory method.

One main struggle before this dissertation started was the lack of information about what

peculiar features single out JA. Now, the dissertation has successfully determined some salient sociophonetic features of JA. Following some sociophonetic perception studies, such as Campbell-Kibler (2007), and modelling after Garrett et al. (2005), the dissertation identified word-initial consonant sequences and /r/ as two of the salient sociophonetic features of JA. Therefore, this contributes to the literature of JA and facilitates the set up for future work.

Another goal of the dissertation was to grasp the attitudes of Saudi speakers toward JA and understand how the two linguistic features contribute to the identification of the Jazani speaker and the possible meanings associated with them. By the perceptual and the language attitude study on JA, the dissertation accomplished that, allowing a better understanding of the stereotypes and beliefs on JA, which add to folk-linguistics and the recent growing interests in attitudes to Saudi dialects. Results of this dissertation proved that attitudes to JA differed based on respondents' dialects reflecting the social stratification in Saudi Arabia. This work also demonstrated beliefs and stereotypes that people have for JA.

Due to paucity of work on the phonology and sociolinguistics of JA, the presented data and analyses in this dissertation make an essential contribution to knowledge of the dialect itself and to Arabic dialectology. The dissertation is the cornerstone for JA phonetics, phonology, and sociolinguistics, a reference, and a starting point for further directions. Below, I discuss some possible future work.

5.5 Further Directions

The dissertation, as with any other research, had some limitations, that are due to time or practical constraints, which merit further investigation. As mentioned before, the dissertation provided a phonetic analysis that paved the way to a phonological analysis. Thus, the dissertation servers as a starting point for collecting further phonological evidence on Jazani word-initial

consonant sequences. To do so, a study would need to provide a metrical phonological analysis that could go along with the phonetic analysis. For clarity, a metrical analysis will be able to show if the extrasyllabic consonant constitutes a syllable unit. For instance, if the Jazani dialect has a certain metric pattern that is followed in poetry, it would help to see how extrasyllabic consonant is or is not linked to a syllable. In poetry, certain languages have certain metrical structure for poems. For example, a language like Tashlhiyt Berber has a meter which constitutes of 13 syllables. These syllables in the meter follow a systematic syllable weight order: L H L L L L L L H L H L L, where (L) for light syllables (syllables without a coda) and (H) for heavy syllables (syllables with a coda) (Dell, 2011). When these syllables are aligned to tones in songs, each single syllable must be associated with only one note, and two syllables cannot share the same note. Tashlhiyt Berber allows consonant clusters that are simplex in nature. Dell (2011) shows that the nuclear consonant in a vowel-less syllable of two consonants is linked to a note or a pitch. Such similar piece of evidence can be attainable if and only if the pattern in question is found in Jazani poetry. Therefore, one limitation of the dissertation is not providing a metrical analysis due to the lack of Jazani poems, that have the patterns in question, that the dissertation could have benefited from.

Discovering that JA has similar pattern to that of Moroccan Arabic and Tashlhiyt Berber leads us to question the syllabic organization of such sequences in other varieties of Arabic. Many Arabic dialects are claimed to allow complex onsets, such as Najdi Arabic. Whether evidence for such claims are provided or not, it is worth investigating these word-initial sequences. Najdi Arabic could easily lend itself into the temporal organization research as well as metrical phonology as it is well-known and rich with poems. Further research following the direction of this study could consider the syllabic organization of word-initial consonant sequences of other languages e.g.

Arabic or Saudi dialects, such as Najdi Arabic.

With the effectiveness of the acoustic measurements and the success in studying the syllabic organization of word-initial consonant sequences in English and now JA, further acoustic studies that focus on the syllable structure of the coda sequences are possible and needed. Along the lines of this dissertation, one direction would be studying the unknown syllabic organization of JA coda sequences, as well as other debatable sequences in other dialects or languages.

In this dissertation, the non-emphatic /r/ was borne out to be salient feature of JA. Although the three Jazani speakers were from the same region, Samtah (but from different villages), there is noticeable variation in the comments on /r/ production across the three Jazani speakers, which could lead to the following questions; (a) Are there certain social groups that exhibit different production of /r/? Or (b) Is this a change in progress? Or (c) Is this variation has been stable? (d) Is this a possible contact effect? In a similar vein, the variation in the comments on /r/ shed light on further research that needs to be conducted in the production and the perception of /r/ in JA. Therefore, more data and further work are needed to better understand this linguistic variable in this dialect.

There are other linguistic features that were pointed out by the respondents as salient or different in JA that are also worth investigation. For instance, as mentioned before, respondents considered southerners' pronunciation of /ħ/ and /dʒ/ to be different from non-southern Saudi dialects. One possible direction of this observation is to investigate the place of articulation of these segments via phonetic or articulatory methods. With respect to /dʒ/, one possible finding is that /dʒ/ has lenited to /ʒ/, as claimed for Hijazi Arabic (Omar & Nydell, 1975). Speaking about /ħ/, it is very likely that vowels preceding or following the segment trigger the different perceptions. Along the same lines, respondents perceived /g/ differently, claiming that there is

"sharpness" in pronouncing it. As previously mentioned, I anticipate that is due to the surrounding vowels, specifically high short front vowels [i] and [i] which trigger the perception. Therefore, a thorough phonetic investigation of /ħ/ and /g/and their vocalic environment is needed.

As mentioned throughout this dissertation, word-initial cluster is a well-known linguistic feature associated with Samtah variety of JA. For example, as I stated in Chapter 1 there are five varieties of Jazani dialect; in the qualitative responses, some Jazani respondents reported exactly the name of the Jazani variety used in the audio recordings, namely the Samtah variety of JA. What to take from this, is that Jazanis know themselves and distinguish the different spoken varieties of JA. For instance, a Jazani speaker/listener can distinguish a Samtah from a Sabyani speaker due to peculiar features in each variety. This leads to one possible direction by looking at how Jazanis themselves can identify the different varieties of the dialect, and what attitudes they may have toward each other. Also, further detailed research that focus on morphological and phonological features of these varieties will considerably add to the literature of JA.

APPENDICES

APPENDIX A

Research Participant Information and Consent Form – Production Experiments

PROJECT TITLE: Acoustics of Secondary Articulation in Human Language
INVESTIGATORS: Karthik Durvasula, Elliot Selkirk, Mohammed Ruthan

PURPOSE: You are being asked to participate in a research study of speech production of you native language (American English, Japanese, South Korean, Chinese, Arabic). From this study, the investigators hope to learn more about important control characteristics of human speech production. Your participation in this study will take about 20-30 minutes. If you are under 18, you cannot be in this study.

PROCEDURES: You will be presented with sentences in your native script on a computer screen, and asked to read them out in a normal/calm voice. Your voice will be recorded and later analyzed.

BENEFITS: You will not get financial compensation for your participation in this study. If eligible through your professor, you will receive extra-credit points (to a value determined appropriate by your professor).

POTENTIAL RISKS: There are no foreseeable risks associated with participation in this study.

CONFIDENTIALITY: The data for this project will be kept confidential. Only the investigators will have access to your data. Information about you will be kept confidential to the maximum extent allowable by law. The results of this study may be published or presented at professional meetings, but the identities of all research participants will remain anonymous.

FREEDOM TO WITHDRAW: Participation in this research project is completely voluntary. You have the right to ask questions, not answer specific questions and withdraw participation at any time without penalty.

COMPENSATION: You will not be compensated for participation in this study.

CONTACT: If you have concerns or questions about this study, please contact:

Dr. Karthik Durvasula
Assistant Professor of Linguistics
B-330 Wells Hall
Michigan State University

E-mail: durvasul@msu.edu
Phone number: 517-432-0194

If you have questions or concerns about your role and rights as a research participant, would like to obtain information or offer input, or would like to register a complaint about this study, you may contact, anonymously if you wish, the Michigan State University's Human Research Protection Program at 517-355-2180, Fax 517-432-4503, or e-mail irb@msu.edu or regular mail at 207 Olds Hall, MSU, East Lansing, MI 48824.

INFORMED CONSENT: Your signature below means that you voluntarily agree to participate in this research study.

Signature: _____ Date: _____

APPENDIX B

Word List – Production Experiment 1

Meaning	Transcript	Transcript	Meaning
Proper name	[ħmad]	[mad]	Extend
Nonce	[hmaf]	[maf]	Nonce
Clean	[mħaʃ]	[ħaʃ]	Cut
Nonce	[mħaz]	[ħaz]	Nonce
Hit / stupid	[xmaʕ]	[maʕ]	With
Nonce	[xmak]	[mak]	Nonce
Scratch	[mxaʃ]	[xaʃ]	Get in
Nonce	[mxan]	[xan]	Nonce
Listen	[smaʕ]	[maʕ]	With
Nonce	[smaθ]	[maθ]	Nonce
Catch	[msak]	[sak]	Nonce
Nonce	[msag]	[sag]	Nonce
Proper name (Amjad)	[mdʒad]	[dʒad]	Grandfather
Nonce	[mdʒaT]	[dʒaT]	Nonce
Collect	[dʒmaʕ]	[maʕ]	With
Nonce	[dʒmak]	[mak]	Nonce
Pluck eyebrows	[nmʊS]	[mʊS]	Suck
Nonce	[nmʊk]	[mʊk]	Nonce
Forbid	[mnaʕ]	[naʕ]	Nonce
Nonce	[mnax]	[nax]	Nonce
Get off	[nzɪl]	[zɪl]	Get in
Nonce	[nzɪθ]	[zɪθ]	Nonce
throttle	[znʊT]	[nʊT]	Jump
Nonce	[znʊd]	[nʊd]	Nonce
Sieve	[nxal]	[xal]	Vinegar
Nonce	[nxaʕ]	[xaʕ]	Nonce
throttle	[xnʊg]	[nʊg]	Nonce
Nonce	[xnʊz]	[nʊz]	Nonce
Publish	[nʃʊr]	[ʃʊr]	Consulate
Nonce	[nʃʊS]	[ʃʊS]	Nonce
Hang up	[ʃnʊg]	[nʊg]	Nonce
Nonce	[ʃnʊl]	[nʊl]	Nonce
Blow out	[nfax]	[fax]	Trap
Nonce	[nfad]	[fad]	Nonce
Nonce	[fnʊs]	[nʊs]	Nonce
Slaughter	[nħar]	[ħar]	Hot
Nonce	[nħað]	[ħað]	Nonce
Cook	[ħnɪd]	[nɪd]	Rival
Nonce	[ħnɪf]	[nɪf]	Nonce

APPENDIX C

Word List – Production Experiment 2

Meaning	Transcript	Transcript	Meaning
Proper name	[ħmad]	[mad]	Extend
Hit/stupid	[xmaʕ]	[maʕ]	With
Listen	[smaʕ]	[maʕ]	With
Cook	[xmad]	[mad]	Stretch
Throttle	[znʊtˁ]	[nʊtˁ]	Jump
Throttle	[xnʊg]	[nʊg]	Nonce
Hang	[ʃnʊg]	[nʊg]	Nonce
Cook	[ħnɪd]	[nɪd]	Rival

APPENDIX D

Recruitment Posts – Attitude Survey

Message to moderator of "Saudis in USA"

Dear *"Saudis in USA"* Moderator, I would be grateful if you could post the following message on the site. I am a Saudi student pursuing a PhD degree, and I am trying to recruit Saudi nationals to participate in a short survey. Many thanks, Mohammed Ruthan.

Facebook recruitment post

Are you a native speaker of Saudi Arabic? Are you willing to help with a short linguistic experiment on Saudi Arabic dialects? I am a Ph.D. student at Michigan State University. I am conducting a research study of where people think dialects are in Saudi Arabia, and what they think of those dialects. I am recruiting participants who are native speakers of Saudi Arabic, aged between 18 and 70.

In the experiment, you will answer a few questions about your age, gender and education and listen to three brief recordings of people talking. You will be asked what you think of the people you heard, and where in Saudi Arabia you think they are from. The time for the experiment will be in late July and early August. The experiment can be accessed here: [link]. The whole procedure will only take about 15-20 minutes. Responses will be anonymous. You will not need to provide your name.

If you have any questions, please contact me via email. My email address is: ruthanmo@msu.edu

Thank you for your attention!

APPENDIX E

Consent Form – Attitude Survey

PROJECT TITLE: Attitudes to Saudi Arabic dialects
INVESTIGATORS: Suzanne Wagner, Karthik Durvasula, Mohammed Ruthan

PURPOSE: You are being asked to participate in a research study of language attitude of your native language (Arabic). From this study, the investigators hope to learn more about people's attitudes toward certain dialects of Arabic. Your participation in this study will take about 15-20 minutes. If you are under 18, you cannot be in this study.

PROCEDURES: You will be presented with audio recordings for three speakers in certain Arabic dialect, and asked to identify the origin of the speakers, and rate them on scales based on different characteristics. Your survey responses will be later analyzed.

BENEFITS: You will not get financial compensation for your participation in this study. If eligible through your professor, you will receive extra-credit points (to a value determined appropriate by your professor).

POTENTIAL RISKS: There are no foreseeable risks associated with participation in this study.

CONFIDENTIALITY: The data for this project will be kept confidential. Only the investigators will have access to your data. Information about you will be kept confidential to the maximum extent allowable by law. The results of this study may be published or presented at professional meetings, but the identities of all research participants will remain anonymous.

FREEDOM TO WITHDRAW: Participation in this research project is completely voluntary. You have the right to ask questions, not answer specific questions and withdraw participation at any time without penalty.

COMPENSATION: You will not be compensated for participation in this study.

CONTACT: If you have concerns or questions about this study, please contact:

Dr. Suzanne Wagner
Associate Professor of Linguistics
B-401 Wells Hall
Michigan State University

E-mail: wagnersu@msu.edu
Phone number: 517 355-9739

If you have questions or concerns about your role and rights as a research participant, would like to obtain information or offer input, or would like to register a complaint about this study, you may contact, anonymously if you wish, the Michigan State University's Human Research Protection Program at 517-355-2180, Fax 517-432-4503, or e-mail irb@msu.edu or regular mail at 207 Olds Hall, MSU, East Lansing, MI 48824.

INFORMED CONSENT: By clicking on the button below, you voluntarily agree to participate in this online survey.

Yes, I Agree _____ No, I do not Agree _____

APPENDIX F

Attitude Survey Questions

1. What is the city you lived in up to the age of 8?
2. How old are you?
3. What is the highest degree you achieved?
4. What is your gender?
5. What is your Saudi regional dialect?

6. Now, listen to the audio recording by clicking on the button below.

(SPEAKER 1 Audio)

How do you rate this speaker based on the following characteristics?

Friendly	○	○	○	○	○	○	Unfriendly
Smart	○	○	○	○	○	○	Stupid
Slow	○	○	○	○	○	○	Fast
Pleasant	○	○	○	○	○	○	Annoying
Educated	○	○	○	○	○	○	Uneducated

7. On the map, identify the region origin of the following speaker/s.

8. What city/region did you choose?
9. What general impressions or thoughts do you have about the speaker?
10. What do you think of the speaker's accent?
11. What are the things about his accent that stood out for you as you listened?
12. What do you think of the speaker's socio-economic status? That is, what kind of job the speaker might he have, and what kind of education do you think he has had?

- Repeat 6-12 for (SPEAKER 2 Audio) and (SPEAKER 3 Audio)

13. What impressions or thoughts do you have when you hear a Jazani speaker?
14. What are the salient linguistic features that are pronounced differently in Jazani Arabic?

APPENDIX G

Script for Audio Stimuli - Attitude Survey

IPA phonetic transcription

ja mħammad wɪʃ rɑjk noruħ ʔɪstɪræħat rɑjd
nɪtæbɪʕ mobærɑt ʔɪlbarʃa wa rijæl madrid
ħmad wa talal wa bkar wa kol ʔɪlʃabæb ʕɪndoh
ʔaxɪr marrɑh jom rɪħna wa tabaʕna ʔɪlmobærɑh hɪnak
kæn fallah wa ʔɪlmobærɑh kænt madʒnonh
smaʕ wɪʃ rɑjk noruħ ʔɪlsæʕah tɪsʕah

Script Translation

Hey Mohammed, how about we go to Rayed's resort to watch Barcelona and Read Madrid soccer match. Ahmed, Talal, and Abkar all the other guys are there. Last time we went and watched the match there it was so much fun and the match scenario was crazy. Listen, how about we go at 9 o'clock.

APPENDIX H

Linear Mixed Effect Models

m1=lmer(data=Ratings,Pleasant~1 + (1|Respondent))

m2=lmer(data=Ratings,Pleasant~Respondents_Dialects + (1|Respondent)) #lowest=best model

m3=lmer(data=Ratings,Pleasant~Age_Group + (1|Respondent))

m4=lmer(data=Ratings,Pleasant~Gender + (1|Respondent))

m5=lmer(data=Ratings,Pleasant~Respondents_Dialects + Age_Group + (1|Respondent))

m6=lmer(data=Ratings,Pleasant~Age_Group + Gender + (1|Respondent))

m7=lmer(data=Ratings,Pleasant~Respondents_Dialects + Gender + (1|Respondent))

m8=lmer(data=Ratings,Pleasant~Respondents_Dialects + Age_Group + Respondents_Dialects:Age_Group + (1|Respondent))

m9=lmer(data=Ratings,Pleasant~Age_Group + Gender + Age_Group:Gender + (1|Respondent))

m10=lmer(data=Ratings,Pleasant~Respondents_Dialects + Gender + Respondents_Dialects:Gender + (1|Respondent))

m11=lmer(data=Ratings,Pleasant~Respondents_Dialects + Age_Group + Gender + (1|Respondent))

m12=lmer(data=Ratings,Pleasant~Respondents_Dialects + Age_Group + Gender + Respondents_Dialects:Age_Group + (1|Respondent))

m13=lmer(data=Ratings,Pleasant~Respondents_Dialects + Age_Group + Gender + Age_Group:Gender + (1|Respondent))

m14=lmer(data=Ratings,Pleasant~Respondents_Dialects + Age_Group + Gender + Respondents_Dialects:Gender + (1|Respondent))

m15=lmer(data=Ratings,Pleasant~Respondents_Dialects + Age_Group + Gender + Respondents_Dialects:Age_Group:Gender + (1|Respondent))

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