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Dialect identification in Saudi dialects: A socio-phonetic approach

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Abstract

Dialect identification research as a subset of perceptual dialectology has largely debated whether the presence of phonetic/phonological cues can significantly boost listeners' recognition of a speaker's place of origin. Therefore, this paper developed the dialect identification method, proposed by Preston (1999), by controlling the presence of phonetic cues, which was achieved by presenting 15 pairs; each pair had the same meaning in the two researched dialects and differed only in one vowel segment. Using an online questionnaire, this study examined the perceptions of a demographically represented sample of 289 Saudi towards phonetic differences in two main dialects in Saudi Arabia: the Najdi and Hijazi dialects. The results revealed that listeners' overall identification of the speakers' origin was highly accurate for both the Hijazi and Najdi dialects at 83.2% and 86.3%, respectively. Second, following Le page's (1980) model of predicting language variation and change, the results revealed that both dialects did not show language variation and change. Third, the effects of controlling phonetic cues were successful. However, this research argues that successful identification was boosted by other linguistic and cultural factors specific to Hijazi and Najdi dialects. Therefore, we encourage researchers to further test the developed methodology for other dialects where cultural and linguistic factors are not as salient.

Keywords: dialect; phonetics; phonetic cues; perception; voice stimuli; variations; Arabic; Urban Hijazi Arabic; Najdi Arabic

1. Introduction

Acquiring knowledge of folk linguistics with regard to regional varieties has proven to be a significant field of study in recent years. The studies examine folk perceptions of the distribution of social and regional dialects within particular contexts (Preston & Niedzielski, 2003). Research into folk linguistics arose to complement the linguistic research conducted by dialectologists and variationists (Williams, Garret and Coupland, 1999). Dialectologist and variationist linguists investigate the social and geographical distributions of dialects based on variations that are perceived in languages and dialects, while folk linguists explore the social and geographical distributions from the point of view of non-linguists (Preston & Niedzielski, 2003; Williams et al., 1999).

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Preston developed five main methods for the study of perceptions in folk linguistics, which includes drawing a map task, identifying degrees of difference for ranking tasks, determining correct and pleasant ranking tasks, identifying the dialects and obtaining qualitative data, such as through interviews. The task of identifying dialects is particularly relevant for this study (Preston, 1999, p. xxxiv). Research into dialect identification has revealed the degrees to which folks are sensitive to dialect forms by assigning the folks to their own regions, and their perceptions have been found to be much more accurate than the results obtained from research done by dialectologists (Kerswill & Williams, 2002; Williams et al., 1999). Therefore, the need to tackle dialect identification through folk perceptions is important as it could uncover language variations and changes in particular regions (Preston, 1996).

In this paper, we aim to investigate perceptions towards the geographical distribution of two main dialects in Saudi Arabia: Riyadh dialect in Najd (i.e., central region), henceforth Nadji dialect and Jeddah dialect in Hijaz (i.e., western region), henceforth Hijazi dialect, for illustration of their geographical locations, See Figure 1. To do this, we will follow the dialect identification method that Preston (1999) proposed for the study of perceptions in folk linguistics along with some methodological development.

The study used an online questionnaire in which participants were presented with real voice samples from six Hijazi and six Najdi speakers, who read 16 previously chosen pairs. The participants were then asked to assign each voice to its origin. More details about the study will be given in the Methodology Section (see Section 2).

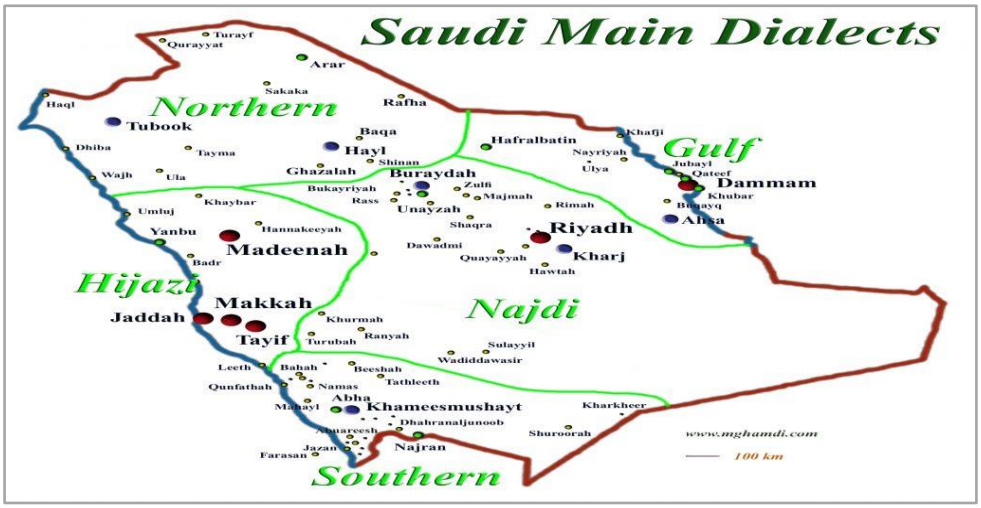

Figure 1. Saudi Arabic dialect map Adapted from (Alghamdi, 2020)

From a theoretical perspective, Preston (1996) designed a model, called the "modes of awareness", which interprets the dialect identification process. The model includes four continual dimensions: availability, detail, accuracy and control. Within each independent continuum, Preston has placed a hypothetical setting in which awareness might occur (see Figure 2).

AVAILABLE -----X---------- UNAVAILABLE
DETAILED ----------X---- GLOBAL
ACCURATE --------X---------- INACCURATE
FULL CONTROL ----------X-- NO CONTROL

Figure 2. Independent dimensions of the "modes of awareness" theoretical model adapted from Preston (1996, p. 41)

First, availability refers to the degree to which aspects of language are available to non-linguists; in other words, to test particular linguistic features from the point of view of the folks. These linguistic features must be available to the folks and prompted by a trigger. Second, the detail dimension indicates the extent to which non-linguists are able to show any details with regard to the linguistic features to which they are exposed. The degree of detail could be shown throughout their comments or choices. Third, accuracy suggests the degree to which non-linguists demonstrate true and correct answers, and fourth, control reveals the ability of non-linguists to produce variety (Preston, 1996). The findings of the present study will be interpreted according to Preston's theoretical model.

As noted above, research into dialect identification could uncover language variations and changes. The theory of focused and diffused speech communities that Le Page (1980) proposed is particularly relevant for this study. This theory suggests that focused speech communities are those that have stable social networks and fewer linguistic variations than others, while diffused speech communities are those that are open to mobility and, as a result, their languages involve rapid linguistic changes. To relate this theory to the current perceptual study, we hypothesize that if the results from perceptions of dialect identification point to a pattern in which members who speak a particular dialect would have a tendency to be able to identify it, this would indicate that the speech community is focused. Conversely, if the members are unable to recognize their dialects, it is likely that their communities experience language variation and change.

1.1. Literature review

In this section, we will review the most relevant studies among those that address dialect recognition tasks. Williams et al., (1999) conducted a study on the abilities of Welsh teenagers to recognize Welsh regional accents. The researchers chose six locations in Wales, and two speakers from a school in each location were selected to record the location's regional accent. Then, tape recordings of spontaneous narratives were presented to Welsh teachers and teenagers from previously selected schools in the same assigned locations. Three main results emerged from the study. First, the recognition rates were generally low to moderate: 30% for the teenagers and 50% for the teachers. Second, the teachers were more successful in recognizing regional accents than the teenagers. The third result was that the Welsh teenagers' recognition rates for their own accents were higher than for other regional accents in Wales. Williams, Garret and Coupland (1999) justified these results by consulting Preston's hypothetical model; they claimed that their results could be due to the limited number of linguistic features that were available to the teenagers, and that this led to inaccurate results and less detailed perceptions. However, some unexpected results emerged from the data and cannot be explained by the degree of availability, since the way the teenagers identified the voices of the two speakers from Cardiff differed widely. Williams, Garret and Coupland (1999) argue that there could be "some degree of phonological explanation" (1999, p. 353). Therefore, in the present paper we will control the presence and absence of the Hijazi and Najdi phonological features by providing pre-selected pairs with each participant being able to listen to the variations for the same word provided by two native speakers of both dialects.

In a similar vein, Kerswill and Williams (2002) conducted a dialect recognition study in England; three sites were chosen: Milton Keynes, Reading and Hull. The participants were chosen from two schools from each of these locations, with a total of 96 adolescents from six schools that represented the working and middle classes. The participants were presented with tape recordings of 10 different adolescents and adult speakers speaking in both the regional accents of these locations and other accents. The recordings were mainly "extracts from personal narratives" (Kerswill & Williams, 2002, p. 180). Unlike Garret and Coupland's study (1999), the researchers in this study expanded the speakers' voices to include adult speakers as well as younger ones from the assigned schools. The

results revealed that, first, with regard to the perceptions of the ingroup community, the Hull speech community was highly focused, as they were very successful in recognizing their own accents. Researchers attributed the successful identification of the Hull participants to the distinctive phonological features of the Hull dialect, which could contribute to the accuracy of their perceptions. In terms of the perceptions of the outgroup community, the study found that dialect recognition depended on how familiar the participants were with the dialect in question. The results of the study also revealed that younger judges in both Reading and Milton Keynes appeared to fail to recognize adult speakers' accents. Researchers maintained that these two cities are experiencing rapid linguistic changes and that, as a result, younger generations found it challenging to identify the accents of older generations.

Montgomery, (2007) went further in investigating dialect recognition by looking at the factors that affect participants' perceptions toward their dialects. Montgomery investigated the Northern English dialect using a triangulation method in which he applied three methods for perceptual dialectology. First, he asked participants to label dialect areas on a map, then he asked them to rate these dialects and finally the participants were provided with audio stimuli from different speakers of the same labelled dialect and asked to locate the origin of the speaker's accent on the map. Montgomery claimed that proximity and cultural prominence played significant roles in participants' perceptions. Essentially, the closer the location is to the participants, the easier it is to identify. Furthermore, Montgomery argued that even if the two locations are not geographically close to each other, the cultural significance of the dialect would compensate for the distance and would significantly raise the awareness of participants (Montgomery, 2012). It is important to note that Montgomery argued that the effects of proximity would be boosted by distinctive accents (Montgomery, 2012). In the present study, we believe that the two dialects that were chosen are distinctive dialects in Saudi Arabia, and they are culturally prominent. However, these dialects are geographically distant from each other. Therefore, the study would be able to test whether the cultural prominence of the Hijazi and Najdi dialects could compensate for the absence of a proximity factor.

Leach, Watson, Gnevsheva (2016) also researched perceptions of dialect identification in five locations in North England. The authors emphasized two issues: the effects of proximity and cultural prominence on dialect identification and the effects of the presence and absence of the phonological features that were presented in tape recordings to participants. In their study, the participants were asked to listen to four sentences from each previously mentioned locality. Researchers considered and analyzed potential linguistic cues in each sentence and their realization by the speakers in the audio stimuli. The results revealed that the more culturally prominent and distinctive the dialect was, the easier it was to identify. The study also found that there was a correlation between the presence and absence of linguistic cues in the audio stimuli and the accuracy of listeners with regard to assigning dialects to their origins. For example, they found that, in one sentence, the presence of the plosive lenition in the speech of the speaker, which is a feature unique to the Liverpool accent (i.e., scouse accent) highly boosted the allocations towards the Liverpool accent. Meanwhile, the absence of the plosive lenition in another sentence deterred listeners from categorizing the speech as a Liverpool. Thus, in the present study we developed our methodology of dialect identification by considering the findings of Leach et al. (2016), who argued that it is "probably impossible, of course, to devise a reading passage which does offer the same opportunities to all accents" (pp. 196-197). Instead, they encouraged researchers to consider the significance of the linguistic cues available to listeners and their effects on the dialect identification. However, we have decided to develop the methodology by substituting a reading passage or sentences for a set of pairs which differ only in one segment (i.e., vowel) and, therefore, can be highly controlled. Thus, the listener will have equal opportunity to hear the variations between the two dialects in question.

1.2. Data context

As mentioned previously, Saudi Arabia is a large country with many dialects (Al-Farsy, 1990). However, very few general studies have looked at the linguistic patterns in Saudi regions and hypothesized their linguistic boundaries (Ingham, 1994; Prochazka, 1988). Aldarsoni (2011) surveyed the linguistic practices in Saudi dialects and divided them into five main dialect regions: the Najdi dialect (Central), the Hijazi dialect (Western), the Southern dialect, the Northern dialect and the Eastern dialect (see Figure 1). Therefore, from this point onwards, we will use Aldarsoni's taxonomy for the dialect regions of Saudi Arabia.

The Najd region is one of the largest in Saudi Arabia and is considered to be an internal region with no external boundaries (Anishchenkova, 2020; Ingham, 1994). From a political perspective, it contains the capital, Riyadh, which gives the region international, social and economic significance. Furthermore, the region was the homeland of the founder of Saudi Kingdom and it witnessed the conquer of his battles to unify the Kingdom. Therefore, such historical and political importance gave the region a cultural prominence (Al-Rojaie, 2020a; Anishchenkova, 2020). As a result, the Najdi dialect (NA henceforth) became a distinctive dialect and one that was well represented in the Saudi media. With regard to the Hijaz region, it is very cosmopolitan, the reason for this being that it has the two most sacred mosques in the Islamic world and receives an annual influx of Muslims from all over the Islamic world (Alahmadi, 2015; Ochsenwald, 1984). Therefore, the dialect of this region is culturally distinctive and commonly represented in the Saudi media. it is important to note here that Hijaz region has a dichotomous language situation where two dialects for two different social groups are used in Hijaz region, they are Hadari Hijazi (i.e., urban Hijazi) and Bedouin Hijazi (other researchers). The reason is being for ideological suppositions that played a significant role in structuring Hijazi society (see Alhazmi, 2018). The present study will tackle only perceptions towards Urban Hijazi Arabic (UHA henceforth).

The present study will tackle the perceptions of two localities (Riyadh and Jeddah) in two dialect regions: Najd and Hijaz. The two localities are distant from each other, with Riyadh situated roughly 590 miles away from Jeddah. Their populations are approximately 7,388,000 and 4,697,000, respectively (General Authority for Statistics, 2018).

The two regional dialects have a considerable number of linguistic variations. Due to space constraints, however, we are not going to discuss all of them here and will only cover the significant ones. Table 1 shows the consonant phonemes of NA by place and manner of articulation (Alfaifi, 2019):

Table 1. Manner and place of articulation of Najdi Arabic consonant phonemes

	Stop	Affricate	Fricative	Trill	Lateral	Glide	Nasal
Bilabial	b					w	m
Labiodental			f				
Dental		ts dz	θ ð ðˤ				
Alveolar	t d		s z sˤ	r	l		n
Alveo-palatal		dʒ	ʃ				
Palatal						j	
Velar	k g						

Uvular	q		χ	ʁ
Pharyngeal			ħ	ʕ
Glottal		ʔ	h	

As for vowels, NA has (/a, i, u/), and their long counterparts (/a:, i:, u:/), respectively; besides the abovementioned short vowels, NA vowel system contains the high front vowel /ɪ/ (Alhammad, 2019).

UHA has a similar consonant inventory to that of NA. It, however, replaces the standard /θ/ and /ð/ with the dental stops [t] and [d] (Ingham, 1971). Table 2 below shows the consonant phonemes of UHA by place and manner of articulation (Alfaifi, 2019):

Table 2. Manner and place of articulation of Hijazi Arabic consonant phonemes

	Stop	Affricate	Fricative	Trill	Continuant	Nasal
Bilabial	b				w	m
Labiodental			f			
Dental	t d tˤ dˤ					
Alveolar			s z sˤ zˤ	r	l	n
Palatoalveolar		dʒ	ʃ			
Palatal					j	
Velar	k g					
Uvular			χ ʁ			
Pharyngeal			ħ ʕ			
Glottal	ʔ		h			

UHA is not that different from NA with respect to its vowel inventory. It contains the short vowels (/a, i, u/) as well as their longer counterparts (Al-Mohanna, 2021). UHA has not been documented to have the abovementioned NA high front vowel /ɪ/. A thorough laboratory investigation of the vowels on Saudi dialects including NA and UHA is still lacking; however, such a study is beyond the scope of this paper.

1.3. Research questions

To our knowledge, within the context of Saudi Arabia, no study has tackled the perceptions of the people toward their dialects using a dialect identification method. However, there are three studies of interest that have investigated perceptions using two or three of Preston's methods of perceptual dialectology rather than dialect identification. Alrumaih (2002) examined the perceptions of people in the Najd region toward the main dialects in Saudi Arabia along with modern standard Arabic. To do this, the researcher used a map technique that involved drawing a map and creating two ranking tasks: degrees of difference and correct and pleasant tasks. Alhazmi (2017) used the same techniques to investigate perceptual dialectology in the Hijaz region. Finally, Al-Rojaie (2020b) investigated perceptions toward regional varieties in the Qassim region in Saudi Arabia, using a map task that included a language attitude study in which the participants were asked to jot down characteristics that they perceived as being associated with the dialects on the map. It is, therefore, apparent that research into dialect identification has been largely overlooked in Saudi Arabia, and that there is a need to use

this approach of addressing perceptions. It is important to note that even international research into the way dialects are perceived prioritizes the research techniques proposed by Preston over dialect identification technique (Boughton, 2006; Kerswill & Williams, 2002). As a result, although dialect identification did not develop as much in terms of methodology as did other techniques, this type of identification is a powerful method that has the potential to uncover language and lead to change. Therefore, broad investigation is needed into the dialect situation in Saudi Arabia from the point of view of non-linguists, by asking the following three questions:

1. What is the level of awareness of Hijazi and Najdi participants when identifying their dialects?
2. What is the dialect situation in the Najd and Hijaz regions in terms of language variation and change?
3. What is the effect of controlling phonetic cues in pairs presented in the dialect identification task?

2. Method

2.1. Participants

This experiment's target populations were UHA and NA native speakers. A total of 289 participants were recruited and participated online. One participant reported that her father is a native speaker of UHA and her mother is a native speaker of NA; however, she chose UHA as her dialect. Her results were compared to that of other UHA speakers. The results were not significantly different so they were included. More NA speakers (60%) participated in the survey compared to (40%) of the UHA participants. Similarly, more females (63%) participated than males (37%). Most of the participants (39%) belong to age group number three (between 35 and 44) and (27%) to age group number two (between 25 and 34). As for the participants' level of education, most of the participants either had a Bachelor degree (55%) or a graduate degree (36%). Only (9%) of the participants had a high school degree. Finally, with respect to area of residence, unsurprisingly most participants were from either the central region (54%) or the western region (38%)—where the two dialects are predominantly spoken as discussed above. The rest of the participants were from the Eastern region (4%), Northern region (1%), and the Southern region (1%), roughly. Table 3 below shows the raw numbers of the participants, their dialect, age range, gender, level of education and finally length of residence by region in the past ten years.

Table 3. Percentages of region identification of listeners' regions for each stimulus

Dialect		Gender		Age		Level of Education		Length of Residence	
Category	No.	Category	No.	Category	No.	Category	No.	Category	No.
Hijazi	115	Male	107	18-24	26	High School	26	Western	111
Najdi	174	Female	182	25-34	77	Bachelors	159	Central	161
				35-44	112	Graduate	104	Eastern	12
				45-54	52			Northern	3
				55-64	20			Southern	2
				Over 65	2				

2.2. Data collection procedures

The experiment was conducted using a link through the Questionpro electronic survey development tool (QuestionPro, 2020). In January 2021, the survey was distributed through sending the link to acquaintances by email and social media channels with a request to further distribute the survey to UHA and NA speakers.

The experiment started by asking participants which dialect they speak. The options were "Urban Hijazi or Najdi". The respondents were told to leave the experiment if they did not speak either dialect. Then, the main body of the experiment started. Each trial had the same question "in your opinion, to which region does the speaker belong?". The answers were always the same "Hijaz Region, Najd Region, neither one of them, and I do not know." The participant was expected to select one of the four choices. The participants were able to repeat the audio files of the recording in the question through a playback button on the screen next to the stimuli. The participants were unable to proceed to the next screen until they selected an answer in the current screen. Lastly, a progress bar appeared on each screen for the participants.

After completing all stimuli items in the experiment, the participants were asked to fill out a background questionnaire which asked about: gender, education, age group, residence for the past 10 years, and finally they were asked to write any notes they would like to provide, if they have any". The length of experiment was approximately 10 minutes per participant.

2.3. Data analysis

The data was then collected on an excel sheet for analysis. The data was analyzed with linear mixed-effects regression models implemented in R (R Core, 2015) using the lme4 package in the R statistical environment (Bates et al., 2015). The full model was fit with Answer (the choice selected by the listeners) as the dependent variable. The full model was also fit with the following fixed effects: Listener's Dialect (UHA or NA), Education (High School, Undergraduate or Graduate), Gender (Male or Female), Age (18 -24, 25 - 34, 35 - 44, 45 - 54, 55 - 64 or 65 or above), Area of Residence (region) in the past ten years (Western, Middle, Eastern, Northern or Southern). Participants and Words (stimuli) were entered as random effects. Backwards stepwise comparison was then used to reach the final model, removing each fixed effect (except the random effects) one at a time and comparing the simpler model to the full model by way of a likelihood ratio test (using the ANOVA () function in R) (Baayen, Davidson, & Bates, 2008). Then and when needed, Helmert contrasts were performed. Helmert coding compares each level of a given factor to the mean of the subsequent levels. In this paper, Helmert contrasts were performed in order to compare groups only within the Age variable. The following section discusses the results.

3. Results

As noted above, the 289 participants listened to 32 (16 x 2) items. Overall, the listeners of both dialects were able to identify the region of the speaker (Table 4). Table 4 also shows that the vowels in the pairs whether [a vs. i], [u vs. i] or [u vs. a] do not seem to have an effect on the listeners' choices. However, this finding remains to be tested statistically as discussed thoroughly below.

Table 4. Percentages of region identification of listeners' regions for each stimulus

No.	Stimulus	Dialect	UHA	NA	Neither	I do not know	Vowels
1	[ʁaʃ]	Hijazi	38.41%	40.83%	4.84%	15.92%	[a] vs. [i]

	[ʁiʃ]	Najdi	25.61%	57.44%	5.19%	11.76%	
2	[dagiːga]	Hijazi	98.27%	1.04%	0.35%	0.35%	
	[digiːga]	Najdi	11.42%	83.74%	3.11%	1.73%	
3	[dʒanuːb]	Hijazi	83.74%	4.15%	9.34%	2.77%	
	[dʒinuːb]	Najdi	3.11%	88.24%	6.92%	1.73%	
4	[jiħtarim]	Hijazi	80.97%	6.92%	7.61%	4.50%	
	[jaħtarim]	Najdi	2.77%	92.04%	2.77%	2.42%	
5	[dʒadiːda]	Hijazi	90.66%	3.46%	3.46%	2.42%	
	[dʒidiːda]	Najdi	4.50%	92.73%	1.38%	1.38%	
6	[zamaːn]	Hijazi	96.89%	1.38%	1.04%	0.69%	
	[zimaːn]	Najdi	7.61%	87.89%	3.11%	1.38%	
7	[kabiːr]	Hijazi	91.00%	2.08%	4.50%	2.42%	
	[kibiːr]	Najdi	10.73%	82.01%	3.81%	3.46%	
8	[sˤaʁiːra]	Hijazi	75.43%	13.84%	6.57%	4.15%	
	[sˤiʁiːra]	Najdi	2.42%	96.19%	0.35%	1.04%	
9	[kunt]	Hijazi	92.73%	3.81%	2.08%	1.38%	[u] vs. [i]
	[kint]	Najdi	2.77%	95.16%	1.38%	0.69%	
10	[ruħt]	Hijazi	85.81%	9.00%	3.11%	2.08%	
	[riħt]	Najdi	8.30%	89.27%	1.73%	0.69%	
11	[kul]	Hijazi	84.08%	5.88%	5.19%	4.84%	
	[kill]	Najdi	1.73%	95.85%	1.38%	1.04%	
12	[ʕunab]	Hijazi	75.78%	7.61%	7.96%	8.65%	
	[ʕinab]	Najdi	25.95%	55.36%	8.30%	10.38%	
13	[ʔadrus]	Hijazi	59.17%	29.41%	6.23%	5.19%	
	[ʔadris]	Najdi	2.08%	93.77%	2.08%	2.08%	
14	[taktub]	Hijazi	93.77%	3.81%	1.38%	1.04%	[a] vs. [i]
	[tiktub]	Najdi	1.38%	94.46%	3.11%	1.04%	
15	[junzil]	Hijazi	96.19%	0.69%	1.73%	1.38%	
	[janzil]	Najdi	5.88%	85.47%	5.19%	3.46%	
16	[tirsum]	Hijazi	88.93%	4.15%	3.11%	3.81%	
	[tarsum]	Najdi	1.73%	91.70%	3.81%	2.77%	

Two pairs of all the items were not identified as accurately as the rest of the items. The first pair [ʁaʃ] and [ʁiʃ] was the least pair to be identified correctly among all pairs. More listeners from UHA and NA dialects identified this pair to be NA (40.83% and 57.44%, respectively), whereas 15.52% and 11.76% of the listeners did not know whether [ʁaʃ] and [ʁiʃ] were UHA or NA, respectively. The pair ([ʕunab] and [ʕinab]) although was identified more accurately than [ʁaʃ] and [ʁiʃ], it was not as easy for the listeners as the rest of the items. A substantial percentage of the listeners identified the NA [ʕinab] to be UHA, 25.95% of the time, compared to only 7.61% who thought the UHA [ʕunab] was NA. On the contrary, the UHA [ʔadrus] was identified as NA 29.41% compared to the NA [ʔadris] which was identified as UHA only 2.08%. Finally, the UHA [sˤaʁiːra] item was identified as NA

13.84%, whereas its NA counterpart [sˤiʁi:ra] was identified as UHA only 2.42%. On the other hand, [junzil] was identified to be UHA very highly (96.19%). A very small percentage identified it to be NA (.96%).

As mentioned above, overall, the listeners were able to identify the dialect of the item very accurately. Table 5 below shows the percentages of each answer choice by the dialect. UHA items were identified correctly (83%) of the time by the listeners of both dialects whereas NA items were identified correctly (86.2%) of the time by the listeners of the two dialects. Small percentage of the listeners misidentified the dialect and even smaller percentages of them identified the item to belong to "neither" UHA nor NA, and "I do not know" to which dialect the item belongs.

Table 5. Overal Percentages of the Choice Answers by the Dialect of the Listener

Answer Choice	Hijazi	Najdi
Hijazi	83%	7.5%
Najdi	8.7%	86.2%
Neither	4.3%	3.4%
I don't know	3.9%	2.9%
Total	100%	100%

To sum up, the listeners were able to identify the pairs very accurately. UHA items were identified correctly (83%) of the time by the listeners of both dialects. NA items were identified correctly (86.2%) of the time by the listeners of both dialects (Table 6). That said, the listeners faced some sort of challenge to identify [ʁaʃ] and [ʁiʃ] pair more than the rest of the pairs. The NA [ʕinab] was also a challenge for UHA speakers since 25.95% identified it to be NA.

If we zoom in to the results, it can be seen that the listeners were able to identify the items of their own dialect even more accurately. Therefore, we find higher percentages in UHA where the percentage goes up (83%) by all listeners to (86%) by UHA listeners and compared to 81.2% by NA listeners. NA listeners were also able to identify the items of their own dialect (87.4%) which is higher than the overall percentage by all speakers (86.2%). Table 6 below summarizes the percentages of the four answer choices by the dialect of the listener and how each group of listeners performed on their own dialect and the other dialect; namely, how UHA listeners performed on UHA and NA, and how NA listeners performed on UHA and NA.

Table 6. Percentages of the Choice Answers by the Dialect of the Listener

Answer Choice	Hijazis on Hijazi	Hijazis on Najdi	Najdis on Hijazi	Najdis on Najdi
Hijazi	86%	9%	81.2%	6.5%
Najdi	7%	84.4%	9.9%	87.4%
Neither	4%	3.1%	4.5%	3.5%
I don't know	3%	3.5%	4.4%	2.6%
Total	100%	100%	100%	100%

As can be seen above, the results demonstrate that the listeners identified the dialect of the speaker most of the time accurately. Statistical analyses of the dependent variable (speakers' allocations of the dialect) and independent variables (socio-demographics) were performed in order to investigate the significance of each variable statistically. The independent variables in this paper are the dialect of the

listener, level of education, gender, age and area of residence in the past ten years, as discussed in 2.4 above.

Comparisons of model fit indicate that Participant Dialect ($\chi2 = 0.07$, $p>.01$), Gender ($\chi2 = 2.06$, $p>01$), Education ($\chi2 = 2.06$, $p>.01$), and Area of Residence in the past ten years ($\chi2 = 2.12$, $p>.01$), are all not significant predictors of the listeners' choices of what region the listener belongs to. This indicates that no one factor of these factors yield significant comparisons between the models when removed from the non-full model. That is, comparisons of model fit indicate no significant results to the listeners' identification of the speakers' regions.

Comparisons of model fit also indicate that Age is not a significant predictor of the listeners' choices of what region the listeners belong to, ($\chi2 = 0.067$, $p>.01$). As mentioned above, there were more than one age group (18 -24, 25 - 34, 35 - 44, 45 - 54, 55 - 64 or 65 or above). Helmert contrasts were performed to compare all age groups; the results did not indicate significant differences between the age groups. These results suggest that no specific age group identified the social regions and origins of speakers more accurately than the other groups.

4. Discussion

As discussed and shown in the previous sections of this article, the stimuli of this study were pairs from UHA And NA with only one segment (vowel) different in the two tested dialects. To the best of our knowledge, no study has investigated Arabic dialect identification at such a level; namely where only one segment is different. We further tried to control for as many factors as possible including the gender of the producer of the pairs (i.e., speaker), their age ranges, recordings quality, etc. The results, yet, overall showed that there is a high level of accuracy in the listeners' identification of the dialect. This accuracy indicates that the listeners were sensitive to the phonetic cues which is indicative of how important these cues are in dialect identification. In fact, it is not surprising to see successful identification of dialects using phonetic cues by listeners; for instance, previous research has shown that phonetic cues are used, for instance, by successful second language learners (Iverson et al., 2005; Kim, Clayards & Goad, 2017); in accent identification within one language (Trude & Schmidt, 2012); in language identification (Tang et al., 2017), among others. Here in this paper, we also show that phonetic cues are also important in Arabic dialect identification even when the comparison is between two popular and frequently used dialects of (Saudi) Arabic. The following discussion however translates and pinpoints the listeners' use of socio-demographics in dialect/language recognition and identification by presenting the results from a sociolinguistic perspective in terms of "modes of awareness" as well as the significant contribution of controlling for phonetic cues in such studies.

In the following subsections, we will discuss the findings of the present study in three thematic sections. First, we will interpret the results according to the theoretical "modes of awareness" model proposed by Preston (1996). Second, we will discuss how language variation and change in UHA and NA can be predicted from the present findings. Third, we will consider the effects of the controlled linguistic cues on the results.

4.1. "Modes of awareness" of Hijazi and Najdi

The "modes of awareness" hypothetical model contains four dimensions: availability, detail, accuracy and control (see Figure 1). Only availability and accuracy are relevant in the present study. Before we go further into discussing the results according to these dimensions, we will give a brief justification of why the others are not relevant here. Regarding detail, participants were not asked to provide details about the linguistic features they listened to; rather, the linguistic features were globally characterized by participants. In other words, participants were not given the chance to

comment on why they thought the two pairs differed linguistically. As for control, our methodology did not give the participants the space to perform the two regional varieties.

The results reveal that the linguistic features were available to UHA and NA participants and that the audio clips triggered recognition. How accurate their answers were is interpreted by the accuracy dimension. The findings reveal that 83% and 86.2% of UHA and NA participants, respectively, accurately allocated the voice stimuli. A high level of accuracy can be identified by considering two metalinguistic factors that could potentially affect the cognitive mapping processes of participants: publicity and folk culture artifacts. According to Preston, publicity indicates the degree to which the language or dialect is popular in all types of media and its cultural popularity. Both the UHA and NA dialects are frequently represented in Saudi media. Though the representations of these dialects are stereotypically driven, the scope of the present paper does not tackle attitudes towards them. Therefore, they are not going to be discussed. We argue that the strong representations of UHA and NA dialects significantly raised participants' awareness of the linguistic practices of the two dialect groups. As for the folk culture artifacts, both dialects have noticeable cultural artifacts that have been acknowledged regionally and internationally. In 2010, for example, a historical site located in the Najd region called At-Turaif District in ad-Dir'iyah was registered as a heritage site by UNESCO (UNESCO World Heritage, n.d.). In 2014, Historic Jeddah, the Gate to Makkah was also registered as a heritage site for its symbolic and exceptional cultural importance by UNESCO (UNESCO World Heritage, n.d.). As for intangible heritage, two traditional shows or dances performed by UHA and NA members in traditional festivals have been recognized by UNESCO as well. They are called the Almezmar (representing the Hijazi) and the Alardah Alnajdiah (representing the Najdi) (UNESCO, n.d.). Considering all these factors together, our claim echoes Preston's when he stated that "the importance of the status of a variety as a folkloristic artifact is dramatic" (Preston, 1996, p. 60). Simply put, publicity and folk culture artifacts highly boost the recognition and identification level of the regional dialects. This led us to a wider claim that the activation of the perceptions of linguistic cues is preceded by sociocultural evocation.

A relevant issue that needs to be discussed here is the effect of cultural prominence on the dialect identification process. Montgomery (2002) claimed that nearby dialect regions would boost the recognition process. Furthermore, he maintained that if the regional dialects are not geographically adjacent to each other, then the cultural prominence of the dialects would compensate for the loss of proximity. In the present study, it is evident that both dialects are spatially distant from each other. However, as previously discussed, the cultural prominence of the HA and NA dialects lends itself to interpretation for the present findings, as it worked as a mediating factor for dialect identification. Thus, the findings of the present study support the results of Leach et al. (2016) and Montgomery (2007, 2012), where English accents were highly recognized because of their cultural prominence.

4.2. Prediction of Language variation and change situation in Hijaz and Najd

The results reveal a high level of accuracy regarding the recognition of the phonetic features of the UHA dialect by UHA participants (86%), and likewise of the NA dialect by NA participants (87.4%), see Table (6) below for more details. This result can be interpreted through the use of the focus and diffuse theory proposed by Le Page (1980). We can conclude that both speech communities are highly focused and far from language variation and change in regard to the three vowel sets we investigated in the current study. One possible interpretation that can be put forward is that the distinctiveness of the phonological and phonetic variations of the dialects significantly boost dialect recognition (Kerswill & Williams, 2002; Montgomery, 2012). Thus, due to the distinctive linguistic features of the UHA and NA dialects, the findings point towards a homogeneity of correct perceptions of both

dialects. Our results echo findings from Kerswill and Williams's (2002) study, wherein the Hull speech community were observed to be highly focused as they successfully identified their regional dialect.

In this section, we will discuss one of the unexpected findings from the results of the dialect identification. The pair [ʁaʃ] and [ʁiʃ] was moderately identified by both UHA and NA participants and allocations varied between the two dialects. In order to interpret this result, we first need to mention that all the remaining pairs that tested perceptions of [a] vs. [i] were largely correct. Thus, the failure of dialect identification is relatively marginal. Also, it is important to note that we successfully controlled for phonetic variations in all pairs. Therefore, we reject the idea that the failure of recognition was due to phonetic/phonological variations. Instead, we think that this failure could be related to the ambiguity of the lexical category of the word could cause. That is, the lexical category of [ʁaʃ] can be a noun 'cheating', and a verb "he cheated' in HA. [ʁiʃ], however, can only be used as a noun ('cheating') in NA. Such lexical ambiguity in the lexical category of the word might have led some participants to fail to allocate the word correctly to its dialect group. This argument is supported by the fact that there are no verb counterparts in all other items.

4.3. Effects of controlled linguistic cues on the results

The results reveal that controlling the presence of phonetic cues boosted the accuracy level of dialect identification in listeners. Thus, we argue that directing listeners' cognition to a single linguistic trigger would increase successful identification. Previous research came to support the belief that dialects are perceived as a whole rather than by small linguistic cues (Kerswill & Williams, 2002). In this regard, we argue that the findings of the present study support the belief that dialects can be successfully recognized through presenting single linguistic cues. Though the development of the method was successful, we think that there are other factors that contributed to this favourable outcome. As discussed earlier, these factors pertain to the linguistic and social/cultural contexts of the two dialects. On the linguistic level, the two dialects are distinctive, while on the social/cultural level, they both have a strong presence in Saudi media and are culturally prominent. Further research is needed to test whether the control of phonetic cues would be a successful methodology in dialect identification when the dialects in questions are less distinctive and less culturally prominent. If the results hold true, then the developed methodology would constitute a significant contribution to the field of PD research.

5. Conclusions

In this paper, we asked three research questions: 1) What is the perceived awareness of Hijazi and Najdi participants in identifying their dialects? 2) What is the dialect situation in the Najd and Hijaz regions in terms of language variation and change? and 3) What is the effect of controlling phonetic cues in pairs presented in a dialect identification task?

Regarding research question 1, the results revealed that Najdi and Hijazi listeners showed a high level of awareness of phonetic cues as well as high awareness of the two regional varieties. This might sound like an obvious point to Saudis, but we argue that this conclusion is based on experimental rather than anecdotal evidence. The results were interpreted by consulting Preston's "modes of awareness" model, which explains how the linguistic cues were available to listeners and why their perceptions were highly accurate. Preston argued that the activation of modes of awareness could be triggered by two metalinguistic factors (publicity and folk culture artifacts), which our results came to confirm. For research question 2, the results revealed that both Hijazi and Najdi speech communities proved to be highly focused and far from being prone to language variation and change. Regarding question 3, the results revealed that the proposed developed methodology proved its success in terms

of the tested phonetic cues. Nevertheless, we argue that there are linguistic and social factors that could have played a significant role in the success of the developed methodology. Therefore, we encourage other researchers to further widen the study by manipulating the linguistic and social/cultural factors. In this regard, we would like to shed some light on the general motive behind sociolinguistic study using fine grained linguistic cues. Williams et al., (1999) claimed that a sociolinguistic study shouldn't be confined to answering the question of participants' knowledge in recognizing a given language, but rather an important question has to be put forward—that is, how is this knowledge constructed? The findings revealed this by finding common threads between the dialect and its popularity and cultural artifacts, which both led to cultural prominence.

One limitation of the study is related to the limited number of phonetic cues tested. This is because that we did not want the listening task to be fatiguing. We therefore confined the choice of the variations to the phonetic cues only. We suggest that a study that investigates variations on both the consonant and vowel levels is merited in the Saudi context. Also, we suggest further studies that include more localities in the Saudi context in order to test the validity of the developed methodology.

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