

The effects of gender and social class on the deaffrication of /dʒ/ in Jordanian Arabic

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ABSTRACT

This study investigates the phenomenon of the deaffrication (DAF) of the voiced palato-alveolar affricate /dʒ/ to the voiced postalveolar fricative [ʒ] in Jordanian Arabic (JA) among indigenous Ammani Jordanian speakers. Previous work has found DAF to be more common in the speech of women than in men in other large cities in Jordan (ex., Irbid, Al-Karak). The goal of this study is to assess if the same is true in Amman, a more culturally diverse and capital city in Jordan, via an examination of not only gender, but also social class and word position. Eight L1-JA speakers participated in a self-paced reading task targeting informal, colloquial JA speech. Results suggest that men were less likely to produce the DAF variant than women and that JA speakers from lower-middle social classes were less likely to produce it than those from high social classes. There was no effect for word position.

Keywords: deaffrication, Jordanian Arabic, gender, social class, sociophonetics

1. INTRODUCTION

Deaffrication (DAF) in Jordanian Arabic (JA) is a phenomenon in which the voiced palato-alveolar affricate /dʒ/ weakens into the voiced postalveolar fricative [ʒ]. Although DAF has received a great deal of attention in the literature on phonology and language acquisition [1,6,9,16], only a few studies have examined its social predictors [3,4,8]. The present work aims to contribute to this body of research through a sociophonetic examination of both social and structural predictors of the variable.

The purpose of this study is to investigate DAF as it occurs in JA among indigenous Ammani Jordanians (from Amman, Jordan) of different social classes. The DAF variable was chosen because it is a high-frequency phonetic variant of the /dʒ/ phoneme in JA; it is important to point out that although /ʒ/ is a phoneme in other varieties of Arabic, it is not in JA. In Modern Standard Arabic (MSA), the phoneme that is orthographically represented as /ج/ is realized as [dʒ] in some Arabic varieties and as [ʒ] in others. While there is an

"overlap regarding the two variants as far as the geographical distribution is concerned" [5], the JA phonemic inventory includes the phoneme /dʒ/ to the exclusion of /ʒ/. Given the way assimilatory processes behave across affricates in JA [14], it is expected that there will be word positional differences in how the DAF variant is conditioned. Considering the widespread alternation between [dʒ]~[ʒ] in JA, a rigorous examination of its distribution should provide insight into the roles of gender and social class in Ammani society [8,10].

Affricates are stops followed by fricative releases [7]. Hence, the deaffrication of an affricate simply involves the dropping of the stop segment and the retention (and/or lengthening) of the fricative portion. Figure 1 illustrates the difference between the Arabic affricate /dʒ/ and its deaffricated fricative variant [ʒ] on a spectrogram.

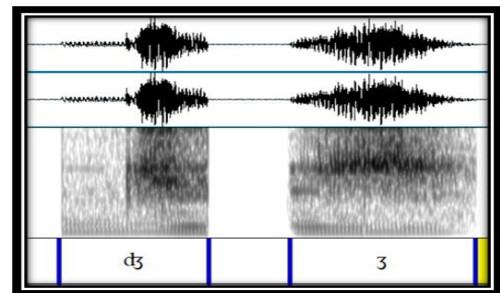


Figure 1: /dʒ/ and [ʒ] on a spectrogram

Ethnicity and rurality have been found to condition DAF usage: Palestinian Jordanians of urban Palestinian origin have been found to use higher rates of the [ʒ] variant, while indigenous Jordanians in provincial towns show higher rates of the standard [dʒ] [2,3,8]. Others have reported interactions between age and education level [3], in which more educated, younger women were found to use the DAF variant more often than less educated, older ones. Previous studies have identified urban women (i.e. in urban centers like Irbid) to be the initiators of language change in Jordanian society [8]; [4] later found that both gender and social class were the strongest predictors, with higher class speakers using more innovative variants than lower class speakers. Since younger speakers were found to use the DAF variant more often than older speakers, [4] argues

for the possibility of a change in progress with regard to DAF in JA.

2. METHODS

2.1 Research Questions

The present study seeks to answer the following research questions (RQs):

- **RQ1:** Which gender group (males or females) is more likely to use the DAF variant in a reading task?
- **RQ2:** Which class group (low-middle vs. high) is more likely to use the DAF variant in a reading task?
- **RQ3:** Does word position (word-initial, word-medial, and word-final) influence the appearance of DAF in a reading task?

2.2. Hypotheses

Based on previous literature, the present research makes the following hypotheses (H):

- **H1:** Females are more likely to use the DAF variant than their male counterparts.
- **H2:** High-class individuals are more likely to use DAF than those from lower classes.
- **H3:** It is expected that there will be positional differences in the conditioning of the DAF variant. However, due to gaps in the pre-existing literature, the directionality of these differences cannot be hypothesized.

2.3 Participants

16 participants (aged 22-24) balanced for gender, were recruited through word-of-mouth and WhatsApp. They were placed into two social class groups on the collective basis of the following criteria, following [10]: university type, residential area, and parental yearly income. Each social class group comprised 8 participants, balanced for gender (4 males, 4 females). One group consisted of upper-class individuals born and raised in West Amman, “a prestigious residential area” [10] who attended private universities and had parents of high socioeconomic status. The second group comprised lower-middle-class individuals born and raised in East Amman, “a non-prestigious residential area” [10], who attended public universities and came from families of lower-middle socioeconomic status. Each of the four groups ultimately contained

four participants: upper-class women, lower-middle class women, upper-class men, lower-middle class men (16 total). In an attempt to eliminate the effects of education, urbanization, and age, this study collected data from participants who attained the same level of education (4 years of college), were in the same age group (22-24), and who lived in the same city (Amman). Thus, the only two differences between the participants were gender and social class. To avoid the contact effect of other Arabic dialects [12] where the DAF variable is a phoneme and not a phonetic variant, this study examined only the speech of Indigenous Jordanians, to the exclusion of Jordanians of Palestinian or Syrian origins. Amman was chosen as the site of this investigation due to its status as the capital and largest city of the country. This choice was made because smaller cities with more homogenous populations may not exhibit the same patterns of speech indexing as seen in culturally diverse areas with higher rates of both indigenous and nonindigenous JA speakers.

2.4 Stimuli and Procedure

A reading passage was designed to mimic an informal JA style using colloquial words and phrases popular among L1-JA speakers. This method was chosen to facilitate data collection during the global pandemic, and because previous work has reported that young speakers who use the DAF variant in speech also use it in reading tasks [8]. The reading passage contained fifteen instances of /dʒ/ distributed equally in word-initial, word-medial, and word-final positions. The target words used in the study are shown in Table 1.

IPA	Gloss	Position
dʒəd hæ	grandpa	Initial
dʒəd ethæ	gramma	
dʒæ bæl	mountain	
dʒal ilæ h	Jaleeleh	
dʒæ nub	south	
æ ldʒ æ ʊ	weather	Medial
jdʒ mæ f	collect	
dæ dʒ æ dʒ	chicken	
θ æ l æ dʒ eh	fridge	
est æ dʒ el hum	hurry them up	
el dæ r æ dʒ	stairs	Final
be ht æ dʒ	needs	
taw wadʒ	crowned	
zæ w æ dʒ	marriage	
be j b h e dʒ	to charm	

Table 1: Target Words

Participants were sent the passage via email and asked to read and record it as a .wav file using a Knox TM gear microphone and the recording application "Voice Recorder" on a Windows operating system, when there was no one present with them in the room. The recordings were then fed into the software Praat [11] for phonetic analysis.

3. ANALYSIS

3.1. Measurements

Tokens of /dʒ/ were assessed and measured using two different spectrographic cues: 1) presence of stop closure in affricates, and 2) the presence of friction in fricatives. Given that fricatives are formed by forcing airflow through a narrow constriction between passive and active articulators, they were assessed on the spectrogram via the presence of aperiodic vibrations (turbulence) at high frequencies. Conversely, affricates were assessed via the presence of a stop closure followed by the high-frequency turbulence of a fricative [12]. Figures 2 and 3 show the visualizations of standard [dʒ] and the DAF variant [ʒ] on the spectrogram in the word /daradʒ/ 'stairs.' As illustrated in Figure 2, the affricate [dʒ] has two parts: a short stop closure followed by short high-frequency turbulence, characteristic of a fricative. Figure 3, on the other hand, shows the DAF variant, which features a longer period of turbulent energy at a high frequency.

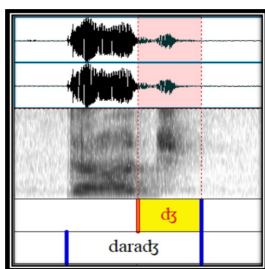


Figure 2: /dʒ/

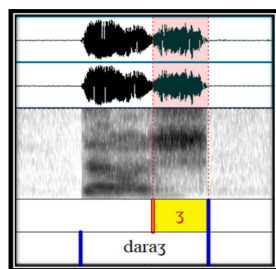


Figure 3: DAF variant

3.2. Statistical Analyses

Measures of binary DAF occurrence were submitted to a stepwise logistic regression with gender (male, female), social class group (high, mid-low), word position (initial, medial, final), and all possible interactions thereof as independent variables, using the glm() function in the glm2 statistical package in R [13]. All visuals were created using Excel and the interaction.plot function in R [13].

4. RESULTS

The stepwise model determined the bestfit model to contain: gender + social class group + gender*social class group. Word position did not figure in the bestfit model. The output of the optimal model is visualized in Table 2:

	Odds Ratio	Std Error	P-value
Intercept	18.99926	0.5923	<0.001 ***
genderMale	0.03271571	0.6491	<0.001 ***
groupmid-low	0.234453	0.6798	<0.005 *
genderMale:groupmid-low	1.4414	1.0247	0.159

Table 2: Bestfit model

Results of the logistic regression found a main effect for gender (p<0.001) such that male speakers were 96.72% less likely to produce the DAF variant than female speakers. This effect is visualized in Figure 4:

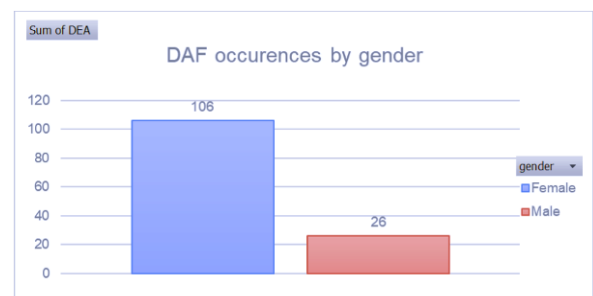


Figure 4: DAF occurrences by gender

There was also a main effect for social class group (p<0.001), such that the mid-low class speakers were 76.34% less likely to use the DAF variant than high-class speakers. This effect is visualized in Figure 5:

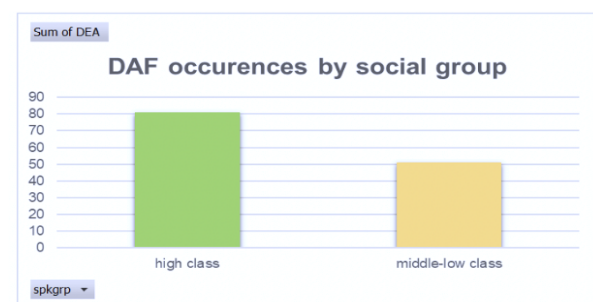


Figure 5: DAF occurrences by social class group

No effect was found for the two-way interaction between group and gender (p=0.159). High-class females and males used DAF more often than mid-low class females and males, but the effect was not significant, as visualized in Figure 6:

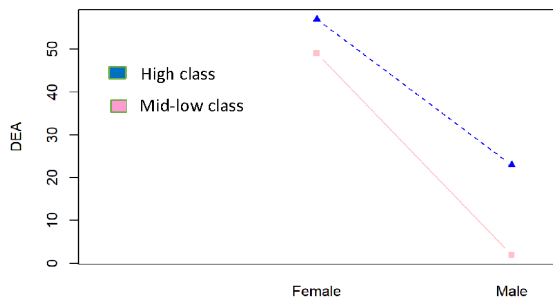


Figure 6: DAF by gender and group

5. DISCUSSION

The main findings of this study suggest that both gender and social class affect how often people produce the DAF variant in Amman, Jordan. In regards to RQ1, it was found that women produce the DAF variant significantly more often than men, in support of our hypothesis. This provides additional support for [3] who targeted uniquely female speakers in their investigation of other social predictors of language variation. Additionally, the finding supports [3,4,8,14] by suggesting that (young Ammani educated) women are more prolific users of the DAF variant than men, indirectly signaling that they may be leading this linguistic change in Amman, as has already been reported more generally for other linguistic variables in cities like Irbid [8] and Al-Karak [14].

For RQ2, it was found that high-class individuals produce the DAF variant more frequently than lower class individuals, also in support of our hypothesis. This finding lends additional evidence to [4,8] who reported speakers in higher classes in Jordan to use more innovative variants in speech, including the DAF variant, all around. This finding also develops on previous work in sociolinguistics that has reported higher classes to be less sensitive to mechanisms of prestige and linguistic accommodation overall, due to their inherently privileged status [15].

For RQ3, it was found that word position did not significantly or meaningfully predict the occurrence of the DAF variant, contra our hypothesis. In fact, the word position factor did not figure into the bestfit model reported here (or any competing models proposed by the stepwise analysis). This finding suggests several possibilities: 1) that phonological environment is not a meaningful predictor of the DAF variant, or 2) that our operationalization of DAF (word-initial, word-medial, word-final) was not adequate to capture any phonological conditioning that may be present in the variable. [8] suggests that the alternation between the two variants is, in fact, phonetically conditioned, but that its appearance is predicted not by where it occurs in the word,

but by the place features of certain adjacent consonants, i.e. it is more common in front of dentals and bilabials than in front of vowels. A third possibility is that phonological environment may, in fact, play some role in predicting the appearance of DAF, but that its effect is much weaker than that of the social factors of gender and social class under investigation here.

Future research should seek to more robustly examine the interaction of age with gender and social class. The participants in the present study were all between the ages of 22 and 24, and therefore represented only a sliver of the Ammani population. This fact also calls for a more robust operationalization of social class, in particular one that is based on the participants' own income rather than that of their parents.

In terms of structural variables, future research should seek to examine the conditioning behaviors of adjacent segments, as well as overall syllable count in the target word, as the variable may be preferred in internal position, primarily when it occurs in bisyllabic words [8]. The role of lexical frequency should also be considered, given the oft-reported tendency of higher-frequency words to more readily exhibit sociophonetic variation. From a phonetic standpoint, future work may choose to include durational and spectral measures of the DAF variant that seek to qualify and compare its energy distribution relative to whole segments. In spite of its social distribution, it has been reported that the [dʒ]~[ʒ] alternation is not a salient and, therefore, not a stigmatized linguistic marker in Jordan [4,8]. However, a post-conversation with one of the participants indicated otherwise. When asked why she deaffricated her /dʒ/, she claimed that the DAF variant made her speech "sound more feminine." As such, it is possible that the deaffricated variant [ʒ] is, therefore, becoming a more salient marker in JA.

6. CONCLUSION

This study investigated the role of gender, social class, and word position on the appearance of DAF in JA. Results revealed that women and individuals from high social classes were more likely to use the DAF variant than men and individuals from lower social classes. While the interaction did not reach statistical significance, it can be observed descriptively that women from higher social classes were the most likely to use DAF than any other group. A variety of elicitation methods and more engagement in ethnographic fieldwork are needed to determine the socio-indexical properties of DAF and listener attitudes towards it in JA.

7. REFERENCES

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