?-Variation in Northern Jordanian Arabic: Manifestations of Standard Origin

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Abstract
The study investigates the phonetic behavior of the glottal stop in different in- word – positions (initial, medial, final) and across word-boundary in Northern Jordanian Arabic (NJA), and attempts to examine its convergence to that behavior described for classical Arabic in standard references. The study provides detailed quantitative data about ?- variation in NJA, and concludes that NJA is essentially similar to the standard model in demonstrating the sound's different variants, viz., fully- articulated ?, weak glottal constriction, substitution and deletion under similar phonetic conditioning. The study also finds some slight deviations from the standard possibly attributed to differences in the linguistic practice in both varieties, and reveals some innovations, especially in the substitution process.

1. Introduction
The glottal stop (so described on the IPA Chart) figures in the phonology of many world languages, and receives much research concern. Functioning in Arabic as a separate phoneme, or gesture (to use Browman and Goldstein's term, 1992: 156) demonstrating interesting phonological variants, it has also1 been intensively studied by modern linguistics (e.g. Moscati, 1969, Brame, 1970, Abu Salim, 1989, Gorgis, 1982, 1990, Shatanawi, 2005) in classical Arabic as documented in standard references, or as represented in the different Quranic recitations (e.g. Al-Qaysi, 1981, Al-Hamd, 1986, Al-Kilani, 2000, Al-Omari, 2002, Isteitiyyeh, 2003, to mention only a subset). The various phonological alternations the sound may assume in both standard domains provide either directly or indirectly much evidence in favor of the phonetic view that the sound is no more than glide, specified by the features [

Comparatively, the phonology of the glottal stop in non-standard Arabic accents developed over tens of centuries from Standard Arabic has received very little research concern, that no much is known about the subject matter in these accents, and about the extent to which these accents maintain the same phonological variations described for the standard model. The available literature is mainly traditional descriptive books which are often impressionistic and not corpus-based (e.g. Anees, 1992, Hilaal, 1993, Saloom, 1996, Al-Khalil and Al-Qasim, 1996 Al-Ozayzi, 2004, Al-Zobi, 2005, to mention only these.)

As one step in bridging such gaps, the present study handles the phonology of the glottal stop in both Standard Arabic (SA) and Northern Jordanian Arabic (NJA)3 (the researchers' accent), and attempts to find the extent to which NJA retains the standard phonological alternations. More specifically, it investigates these alternations in different in-word-positions (initial, medial and final) in the casual speech of many speakers of NJA, and attempts to compare and contrast them with those documented for classical Arabic in standard references (basically, Sibawayhi's Al-Kitaab, verified 1966).

The study adopts a quantitative descriptive approach, which, to our knowledge, has not been thus far utilized in investigating the phonological alternations of the sound in different in-word-positions in NJA. These alternations were examined in relatively representative casual speech data obtained from tape-recordings made for twenty subjects judged impressionistically to be native speakers of NJA. (See methodology below.)

Though classical Arabic linguists provide no quantitative evidence as to the frequency of each realization in SA, and this hinders adequate comparison, examples from both varieties were compared and contrasted. Similarities and differences were highlighted and possible explanation of differences were suggested.

The study hypothesizes that the glottal stop phonological variation in NJA is essentially similar to that in the standard origin, and the deviations observed are most likely attributed to differences in the linguistic practice in each variety, and to some phonological innovations possibly peculiar to NJA.

2. Methodology
2.1. Subjects
According to Romaine (1982: 15) “The search for the illusive homogeneous speech community is well documented”. Nonetheless, it is possible to operationalise the NJA category by selecting speakers who we may consider to be roughly representative of this category (See Kerswill, 1996a, 1996b, Kerswill and Williams 2000.)

The subjects were 20 NJA speakers (13 males and 7 females) who were carefully selected on the basis of their residency history: all were born and have lived and
worked the entirety of their lives in the rural areas of Irbid Governorate in the North of Jordan. All are adult (25-34 years old) and literate speakers. However, in this study adopting in-word-position as a linguistic parameter for tracing the phonetic behavior of the sound, possible effects of sex, age and literacy are not considered.

2.2. Data Elicitation

Casual speech was tape-recorded for the subjects talking freely about different topics of their choices for different periods of time. All sessions amounted to monologues, though some prompting was necessary for a few speakers who were at first a bit nervous about being recorded. Tape-recording was carried out in quiet rooms in the subjects' houses in a friendly atmosphere. A high quality tape-recorder was used to ensure reliable data.

2.3 Data Analysis

Glottal stop instances in the data were spotted, transcribed, and classified according to the distribution of the sound into three main linguistic categories: word-initial, word-medial and word-final. Across word-boundary effects were considered. Different realizations under each category were recognized, counted, tabulated, and studied, where appropriate, with reference to corresponding Standard Arabic examples cited in Sibawayhi's Al-Kitaab, and some other standard references.

3. Variation in Standard Arabic

Sibawayhi (1966: 541) suggests the prevailing norm of “ταιθι” (i.e. producing fully articulated θs) in different in-word positions in SA. Ibn Khalawayhi (verified, 1981: 46) attributes this to ancient Arabs' strong concern with adequate and perfect pronunciation of words, and Ibn Zinjila (verified, 1982: 19) relates it to their common linguistic practice of sounding each letter in the Arabic alphabetical system. Hence θΑρΑ?τυ → θΑρΑ?τυ (I read, past tense), and ρΑ?συν → ρΑ?συν (head).

In cases where it was not fully pronounced, it would undergo what Sibawayhi (ibid) termed “ταξφι:φ” (i.e. lenition), resulting from some inclination for exerting less effort (Ibn Khalawyhi, ibid). "Ταξφι:φ", explains Sibawayhi (542), may take one of three possible forms: "βαψνα- βαψν", "βαδαλ", and "α∆φ", as discussed below.

According to Sibawayhi, "βαψνα- βαψν" (literally in between) involves a realization of θ that is not of a true glottal stop (i.e. a proper glottal catch) and not of a true pure vowel, but something 'in between' having a 'flavor' of both realizations. This type of pronunciation might be similar to what Gimson (1989: 189) calls "weak glottal constriction" (e.g. 'the hospital' may be pronounced in nonstandard English as 'the ?hospital'). A classical example of "βαψνα- βαψν" in initial position is: ωα?ι∆ θΑΑλα ?ιβρΑΑηι:µΥ→ωα?ι∆ θΑΑλα?βρΑΑηι:µΥ (when Abraham said), and in medial position: βι?σα→βι?σα (what an evil!), σα?ιµα → σα?µα (got bored), and σα?αλα→ σα?λα (asked) (Sibawayhi, ibid).
'Badal' (substitution) is the phonological process whereby ? could be replaced by the glides [o, y] or 'alif almad' (i.e. the long vowel α) normally in medial position as in μαθρυ?ατυν → μαθρυωωατυν (readable), ξΑψ?ατυν → ξΑψψψατυν (sin), and ρα?σ → ραασ (head), respectively (Sibawayhi, ibid, 547, but for more evidence, see Assoyotti, verified, 1998: 356).

αΔφ (syncope) involves ?-deletion within the word as in Sibawayhi’s example: σαω?ατυν (genital) → σαωατυν (Sibawayhi: 556).

Despite the fact that there is no quantitative evidence as to the frequency of occurrence of each variant in SA (i.e. ta?qi:q and taxf:ί, including bayna-bayn; badal and αΔφ), one may conclude the following order of frequency as shown in Table (1). This conclusion is based on two basic grounds: first the ancient Arabs’ general tendency to produce fully-articulated ?s in different positions in the word (See Sibawayhi, Ibn Khalawyhi and Ibn-Zinjilah cited above), and second, Sibawayhi’s sequential treatment of the subject matter in Al-Kitaab starting with ta?qi:q and ending with αΔφ may give an indication of the relevance of the suggested order.

<table>
<thead>
<tr>
<th>Phonological Processes</th>
</tr>
</thead>
<tbody>
<tr>
<td>ta?qi:q (?-full realization)</td>
</tr>
<tr>
<td>bayna bayn (weak-glottal constriction)</td>
</tr>
<tr>
<td>badal (substitution)</td>
</tr>
<tr>
<td>αΔφ (syncope)</td>
</tr>
</tbody>
</table>

Table (1): A hypothetical ordering of ?-phonological processes in SA according to frequency of occurrence

The absence of quantitative data on the frequency of occurrence of each phonological process in SA makes it impossible for one to draw a one-to-one comparison with NJA. However, the suggested hierarchy in Table (1) above, in addition to the classical examples reported for SA would serve as guidelines and reference norm against which our NJA data is examined.

4. ?- Variation in Northern Jordanian Arabic

A close examination of the NJA data reveals that the NJA speakers demonstrate all the glottal stop phonological variations reported for SA, as discussed below.

4.1. ta?qi:q

The NJA subjects exhibit fully-articulated ?s in word-initial, medial and final positions, as illustrated in Table 2 below:

<table>
<thead>
<tr>
<th>In-word-position</th>
<th>No. of tokens</th>
<th>No. of fully-articulated? s</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial</td>
<td>2724</td>
<td>2374</td>
<td>87.2</td>
</tr>
</tbody>
</table>
It appears from the table that NJA speakers demonstrate fully-realized ? in all positions, most frequently in initial position (87.2%), less in medial (69%) and least in final position (57%), suggesting that the initial position is more predictive for the presence of ? than the medial position which, in turn, attracts relatively more presence than the final position. Examples:

**Initial Position:**

1. φι:ηα ?ακΤαρ μιν ΝαΣι:ραη (more than one tribe live in it)

2. ?αγΥ:λ λακ ξΑλΑΣ ΝεΙνι ζααιςατ (I say to you it is over as my eyes got dull)

3. φαΝνι ηννι μν?ρομ μηννη ?αδρυς λαςοιψςαατ (it means that I am fond of studying linguistics)

4. ωΑλλΑη ηαφ ?ΥμΥ:ρ κωΑψςεη (I swear that these are good things)

**Medial Position:**

5. φαβασ?αλ ιΣΣαβααβ (Asking the chaps)

6. κααν βιννισβεη ?ιλι μΥΤι:ρ λι?ακΤαρ μιν σαβαβ (for me it was attractive for more than one reason)

7. ?ακΥ:ν μαωδZY:δ Ναλα ρα?σ ιλ θαα?ιµιη (I am present on top of the list)

8. φαλαω φικβαρ ?ανα μιτ?ακδιη ?ανα ρα? ?αρκΥD ωΑρΑΑη (I am sure I will look after him even if he gets older)

**Final Position:**

9. φαηαφ ?αΣφαα δΖαμι:λεη (these are beautiful things)

10. ω ικβις ξΑΑΑ? ?ικβις δΖδδαν (That is even a big mistake)

11. ωαα?ιλι μααΣαα? ΑΛλΑΑη ικβιςιη (my family is big)

12. φικκιν τκΥ:ν ?ΑκβΑρ δΖΥζΥ? μιν ιλΝιλααδΖ (it might be the greatest part of remedy)

The finding of relatively high incidence of realized ? in NJA is generally consistent with the prevalent norm of ta:qi:q in SA as demonstrated in table (1) above, and indicates a general similarity in this respect between the two varieties.

<table>
<thead>
<tr>
<th>Position</th>
<th>364</th>
<th>251</th>
<th>69</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medial</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final</td>
<td>264</td>
<td>151</td>
<td>57</td>
</tr>
</tbody>
</table>
observation of higher frequency of fully-articulated ? in initial position may be attributed to the initial position itself reported in the literature to discourage sound loss. Pisoni and Lively (1995: 447), for instance, observe that when Japanese are trained to perceive/use a sound in initial position, it does not necessarily help them with the sound in final position. Tamimi (2002: 111) finds that 'h' in East London English (ELE) read speech is clearly more frequent in utterance initial function words (100%) than in non-initial ones (66.6%), and so concludes Hurford (1967: 325) for the same accent, though based on casual speech.

4.2. taxfi:f

NJA speakers have shown the different manifestations of taxfi:f in the manner described by Sibawayhi for SA (pp. 541-556), as discussed below.

4.2.1. bayna-bayn

As mentioned above, the bayna-bayn pronunciation of ? involves a weak glottal constriction. It should be noted that the impressionistic identification of such phonetic behavior leaves some room for uncertainty and doubt, and so we have only included in this study the unequivocal and unambiguous cases as counted in table (3) below.

<table>
<thead>
<tr>
<th>In-word position</th>
<th>No. of ? tokens</th>
<th>No. of byna-bayn cases</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>initial</td>
<td>2724</td>
<td>119</td>
<td>4.37</td>
</tr>
<tr>
<td>medial</td>
<td>364</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>final</td>
<td>264</td>
<td>-</td>
<td>-</td>
</tr>
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</table>

Table (3): NJA subjects' bayna-bayn realization of ?

NJA speakers exhibit this type of realization in 119 instances out of 2724 in initial position, as exemplified below.

13. τιωφαφατ γαβλατκαµµιν σανιη (she died some years ago)
14. απαττα λαωα ννυη ιλωαααιδ φαγι:ρ (even if somebody is poor)
15. ?ανα αωωαλι µσβυ:Νειν (I in the first two weeks)

In 13 above, the ? seems to undergo weakening in ?ακαµµιν and its following vowel α moves to precede λ in γαβλα substituting 'sokoon' (silence), hence γαβλα ?καµµιν. In 14, the ? is presumably weakened in ?αννΥη and its following vowel α is placed after ω in the preceding word λαω forming λαωα, hence λαωα ?ννη. Similarly, in 15, the ? gets weaker in ?υσβυ:Νειν and its following vowel u is redistributed after λ in ?αωωαΛη forming ?αωωαΛη, hence ?αωωαΛη ?σβυ:Νειν. These examples are reminiscent of Sibawayhi’s example cited above: οα?ιΔ θΑΛα ιβρΛΑηι:μΥ → ωα?ιΔ θΑΛα θβρΛΑηι:μΥ, and indicative of similarity in this respect between the two varieties.
NJA subjects have shown no reflex of bayna-bayn realization in 364 tokens in medial position, but rather fully-articulated ?s, though they have introduced some candidate words, such as σα?αλ (asked), φα?ισ (gave up hope), µΥ?σιφ (regrettable), ?ατ?ΑξξΑρ (to be late) and συ?ααλ (question). This marks a difference from SA which provides evidence for this process in medial position as in Sibawayhi's examples cited above: βι?σα→βι?σα, σα?ιµα→σα?ιµα, and σα?αλα→σα?ιλα. What may account for NJA speakers' deviation from the standard norm is their tendency to avoid the two consonant clusters that bayna-bayn realization involves as obvious in the foregoing examples. In other words, while SA can tolerate CC, though its basic syllabic structure is CV.CV, NJA generally cannot (e.g. SA µιλ (salt) → NJA µιλι, SA Αρς (afternoon) → NJA ΑρςΥ and SA σαβτ (Saturday) → NJA σαβιτ.)

Sibawayhi reports no single evidence of bayna-bayn realization in final position, possibly because of the unavailability of the phonetic environment favoring this process in this position. Similarly, NJA speakers demonstrate no single instance to this effect.

4.2.2. badal

As mentioned earlier, SA demonstrates ?-substitution into the glides ω, φ or the long vowel αα. NJA speakers exhibit such alternations, in addition to some new innovation, as illustrated in table 4 below.

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</thead>
<tbody>
<tr>
<td>Initial</td>
<td>207</td>
<td>14</td>
<td>6.8</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>189</td>
<td>91.3</td>
<td>2</td>
<td>0.96</td>
<td>1</td>
<td>0.48</td>
<td>1</td>
<td>0.48</td>
<td>0</td>
</tr>
<tr>
<td>Medial</td>
<td>96</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>70</td>
<td>72.9</td>
<td>6</td>
<td>6.25</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Final</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
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</tbody>
</table>

Table (4): NJA Speakers' ?-substitutions

The subjects demonstrate 207 cases of substitution in initial position, 96 in medial position and only 7 in final position, as discussed below.

?→ω
The subjects have shown the SA substitution ?→ω in initial position in 14 instances out of 207. Examples:

16. γΥλτ ωαρρυ:νι ίjαιη (SA ?αρυ:νι: Show me)
17. µιλ οεΙν δΖααϕ ? (SA ?αφ: from where?)

These examples are quite similar to Sibawayhi's Φυλααµυ ?αβι:κα → Φυλααµυ οαβι:κα (your father's servant), though the presence of the case-inflection Y (as in Φυλααµυ) is necessary for this substitution in SA (Sibawayhi, ibid, 543), but not mandatory in NJA. NJA speakers generally tend to drop case-inflections word finally,
hence 'γυλτ' is the NJA version of the SA 'θυλτυ' (I said). NJA speakers' application of ?→ω substitution with no obvious conditioning suggests more inclination towards laxing.

In word-medial-position, the data show no single incidence of ?→ω out of 96 candidates. But this has been observed across word boundary as in:

18. λαωλααδυη (SA λι?αωλααδιη: for his sons)

However, in SA, the ?→ω was reported to take place word medially as in Sibawayhi's example cited above: μαθρυ:?ατυν→μαθρυ:ωατυν (readable).

What seems to be more common than ?→ω amongst the NJA speakers in word-medial position is the change ?→:, as evidenced in 20 cases out of the 96 instances. Examples:

19. τξι∆ωαγταωι (SA τα?ξυ∆: it takes)
20. φκλυαυυυ (SA φα?κυλυυυ: they eat)

Assuming that τα?ξυ∆ is the lexical representation in 19 above, the NJA subjects might have applied the following phonological processes to generate the phonetic form τξι∆. First, 'backing' whereby α has changed into ( given that backing is quite common in NJA. NJA speakers, for example, tend to break SA consonant clusters by back vowels, not by front ones as is the case in different Jordanian varieties of Arabic, hence SA qabl→NJA gabul). Second, ?-deletion, and lengthening of in compensation, hence τξι∆. The same processes might have been applied in 20 above.

This change may be considered an innovation, though it follows in some respect Sibawayhi's substitution rule: ?→ω/υ?. Example: SA μυ?μιν→SA μωμιν (believer). Consistent with this, NJA speakers might have 'backed' the vowel preceding ? and changed it into instead of ω. This can be seen as a step further towards laxing, especially since this does not involve any obstruction to the airflow as the case would be in producing the glide ω.

Just like in SA, the data have not shown any single incidence of ?→ω in final position. (See Sibawayhi: 542-7).

?→φ

Contrary to what is documented for SA, NJA speakers, as can be seen in table 4 above, do not exhibit any single case of ?→φ alternation in initial position. According to Sibawayhi (ibid, 546), ?→φ if it is preceded by ι, as in 'μιν Θυλαμιμ ?αβικα→μιν Θυλαμιμ φαβικα (from your father's servant). A possible reason for the disappearance of this type of substitution in the data is the absence of case-inflections word finally in NJA.
However, the subjects demonstrate a high incidence of \(?\rightarrow\phi\) substitution in medial position (70 out of 96 tokens).

21. βανζζυμ ΤαλαΤμιφιη (SA ΤαλαςΤαμι?): three hundred

22.κωυν νααφιμ (SA ναα?ιμ: sleeping)

23.αανα δααφιμαν (SA δαα?ιμαν: always)

In 21 above, NJA speakers demonstrate \(?\rightarrow\phi\) in medial position since \(\iota\) is preceded by \(\iota\), and this behavior is congruent with Sibawayhi’s phonological rule, though it was meant to describe SA \(?\rightarrow\phi\) in initial position (e.g. Sibawayhi’s ‘\(\mu\iota\nu\ \nu\lambda\alpha\alpha\mu\mu\ \alpha\beta\iota\kappa\alpha\rightarrow \mu\iota\nu\ \nu\lambda\alpha\alpha\mu\mu\ \phi\alpha\beta\iota\kappa\alpha\) (from your father’s servant))

The subjects exhibit the same substitution, but in a different phonetic environment (i.e. \(?\iota\) instead of \(\iota\?)\), as exemplified in 22 and 23 above. This behavior is consistent with that in SA where the glottal stop of the tri-consonantal deverbal noun (e.g. ιαα?ιμ) may be substituted by \(\phi\) (Al-Zamakhshari, 1993: 527).

SA allows \(?\rightarrow\phi\) substitution in final position in only two phonetic environments described by Sibawayhi (552). First, if the word contains two glottal stops word-finally, the latter is replaced by \(\phi\) (e.g. δζαα?ι?→ δζαα?ιϕ: coming). Second, if two \(\iota\)s meet across word-boundary as in imperative sentences, the former is changed into \(\phi\), and the latter is truncated (e.g. ?αθρι? ?αβαακα ?ασσαλααµα→?αθριϕα βαακα ?ασσαλααµα: say hello to your father.).

NJA subjects do not seem to adhere to this standard norm in final position, showing \(?\rightarrow\phi\) substitution when the \(?\) is preceded by \(\iota\). This can be seen in all the seven tokens in the data. Examples:

25. σαηιλ Ναςνυ ηααδιψ (SA: ηααδι?): calm)
26. βιξαββιϕ ?αΣϕαακ ηει (SA: ϕυξαββι?): hides)

\(?\rightarrow\alpha\)

In SA, the change \(?\rightarrow\alpha\) is possible in all word positions: initially (e.g. φαυ ωαφλαατα ?α?αλιδυ→φαυ ωαφλαατα αα?αλιδυ, how come I give birth?!, Sibawayhi, 549); medially (e.g. ρα?σ→ ραασ, head, p.543); and finally (e.g. ιθραʔ→ιθραα, read, ibid 550).

In initial position, and as can be seen in table 4 above, NJA speakers have shown no single case of \(?\rightarrow\alpha\) substitution in 207 tokens. This could be attributed to NJA
phonotactic system that does not normally allow two glottal stops word-initially. In other words, it would not be expected from a NJA speaker to say, for example, α?α?ντα?, have you or are you?, which is quite normal in SA.

Similarly, and contrary to that in SA, the subjects have not shown any incidence of ?→αα substitution in word-final position, but rather ?-deletion, e.g.

27. ιγρα ϕα Sabri (read, Sabri). [SA ιγρα?]

This deletion may reflect NJA speakers' inclination towards laxing, especially since it involves less effort than substitution.

However, in word-medial position, the speakers, as can be seen in table 4 above, demonstrate 6 instances of ?→αα substitution out of 96 candidates. Examples:

28. ΑρΑΑσυ βρΑΑσι (He challenged me) (SA ρα?συη→ SA ραασυη)
29. δαρραστ φι μααδαβα (I taught in Madaba) (SA μα?δαβα→ SA μααδαβα)

Obviously, these examples bring NJA closer to SA in this respect.

?→b

?→b is alien to SA, but it seems to be very common in word-initial position in NJA (189 instances out of 206 tokens). Examples:

30. βασ βαιβηυµ (but I like them) (SA ?Υιββηυµ )
31. βας τυ νυ φι: αζ µυρ:ρ (I feel there is a traffic jam) (SA ?ΥισσΥ)
32. ?ανα βαΣυ:φ ιααλι μυρααα (I feel uncomfortable) (SA ?αΣℵΥρΥ)
33. ?ανα μα βαγδαρ (I cannot) (SA qdIγΥ)

It could be argued that this is not a substitution process since NJA speakers tend to insert b word initially even in words that do not originally begin with ?, such as, βινρυ: (we go), βιτιβηυµ (she loves them), and βιΦνικ (makes you rich). It follows from this that b in 30-33 above is not a replacement of ?, but an inserted sound before a deleted ?. Thus, in 30, for example, SA ?υιββηυµ→ NJA βα?αιβηυµ (at one stage)→ βααιβηυµ, suggesting that b-insertion has occurred before ?-deletion. But this argument may have its flaws, as ?-deletion is possibly older than b-insertion in the history of NJA sound change. This may be supported by evidence from Bedouin Jordanian Arabic where ? is normally retained in initial position (e.g. ?αιββακ (I love you) and ?αγδαρ (I can)). β-insertion is seemingly a recent sound change evidenced in Lebanese, Syrian, Palestinian and Jordanian Arabic. This may lend some support to our claim that the phonological process in 30-33 above is ?→ b replacement.

As expected, the subjects have not shown any single instance of this change in both medial and final positions as this may lead to change in meaning (e.g. σα?α (asked)
→ σαβαλ (let); Σαα? (wanted) → Σααβ (became a grey-haired), or to meaningless words (e.g. φα?σ (axe) → φαβσ; σαμαα? (sky) → σαμααβ, etc..)

?→μ

This type of substitution is also alien to SA, though some of its varieties, most notably Himyar Arabic, was reported to demonstrate λ→μ substitution (e.g. the Prophet's Hadith, "λαφσα μιν ymoon…” (αλβιρ: reverence). A relic of this can be found in NJA "ιμβααρη" (yesterday) for SA "αλβααρηαη".

Since the change into the bi-labial b is very common in NJA, as discussed above, it is not surprising to find some incidence of ?→μ in the data. In fact, this reflex has been observed in 2 instances out of the 207 glottal stop initial tokens, as exemplified below:

34. μιρκιν Ναλεικ (SA ?αρκινυ). I rely on you  
35. μααξ∆ι:ν φικραη (SA ?ααξι∆ι:ν). We reckon that

Just like ?→b, ?→μ change has not been observed in the data in either medial or final positions, and this again may be attributed to the impact this change may have on meaning in terms of change (e.g. "σα?αλ" (asked) → "σαμαλ" (gouged), "βηυδυ?:?" (quietly) → "βηυδυ:μ" (with clothes on)), or meaningless outcome (e.g. "φαδΖ?αη" (suddenly) → "φαδΖµαη" (non-word), "?αδιθΑΑ?" (friends) → "?αΦδιθΑΛµ" (non-word))

?→τ

NJA data have shown a single instance of what might be considered a change into an alveo-dental τ, but only in initial position:

36. ξαμσ τυΣηρ (SA ξαμσατυ ?αΣηρ: five months)

NJA speakers may or may not adhere to the SA syntactic rule stipulating disagreement with respect to gender between number (from 3-9) and countable nouns; hence SA ξαμσατυ (five, feminine) καραασιν (chairs, masculine) → NJA ξαμσ (five, masculine) κΑρΑΑσι, whereas SA ?αρβαΝυ (four, masculine) νισαα? (women, feminine) → NJA ?αρβαΑ (four, masculine) νισωααν (women, feminine). The lack of research in this area makes us only speculate about the instance in 36 above, which may be interpreted as either a) a peculiar commitment to the disagreement rule, i.e. attaching the feminine t to the countable noun (τυΣηρ) (after ?-deletion) not to the number itself (ξαμσ), or b) a case of ?→τ substitution: SA ?Σηρ→ NJA τυΣηρ (and this involves ι-insertion to achieve vowel harmony).

In fact, more research is recommended to verify the possibility of ?-alternations with β, μ, τ because if this were true, it will add to the perplexity of an accurate phonetic description of ? (glottal stop vs. glide)
?-Deletion

NJA speakers have also shown ?-deletion in all positions as summarized in table 5 below.

<table>
<thead>
<tr>
<th>In-word-position</th>
<th>No. of ?-tokens</th>
<th>?-deletion</th>
<th>percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial</td>
<td>2724</td>
<td>24</td>
<td>0.88</td>
</tr>
<tr>
<td>Medial</td>
<td>364</td>
<td>17</td>
<td>4.8</td>
</tr>
<tr>
<td>Final</td>
<td>264</td>
<td>106</td>
<td>40</td>
</tr>
</tbody>
</table>

Table 5: NJA Speakers’ ?-Deletion

As can be seen in the table, in initial position NJA subjects demonstrate a very low incidence of ?-deletion (24 instances out of 2724 tokens; 0.88%), as exemplified below:

37. μαα □αδ βισωα (nobody deserves) (SA ?α□αδ)
38. μαα□αδ βιμααρισ (nobody practices) (SA ?α□αδ)
39. μαα αχζαθιδ (I don’t believe) (SA ?αΛζαθιδ)

According to Sibawayhi (ibid: 545), ?-deletion is possible in SA across word-boundary if ? is preceded by a consonant and followed by a vowel. Formally, ? — Ο /C— V. This involves, explains Sibawayhi (ibid), a consequent placing of the same vowel after that consonant, e.g. SA μαν ?αβυ:κ (who is your father?) → μανα βυ:κ, and SA μαν ?υμμυκ (who is your mother?) → μανυ μμυκ. No such deletion has been observed in the data, though μι:να βυ:κ (who is your father?) is quite possible in NJA.

However, as shown in (37-9) above, NJA speakers may apply ?-deletion when ? is preceded by a vowel; hence SA μαα ?α□αδ → NJA μαα □αδα; SA μαα ?αΛζαθιδυ → NJA μαα αΛζαγιδ. This suggests that NJA is essentially similar to SA in demonstrating ?-deletion in initial position, though in a different phonetic environment.

In medial position, ?-deletion has appeared in 17 cases out of 364 tokens (4.8%):

40. κεIf ελμαρα (how is the woman?) (SA ?αλμαρ?αη)
41. βαδατ ελμαρακι (the school opened) (SA βαδα?ατ)
42. Σααϕλι:νυη Να ρυ:σηυμ (idiom. They respect him very much) (SA ρυρυ:σηυμ)

Interestingly, amongst Sibawayhi’s examples of ?-deletion in medial position (p. 545) is SA αλμαρ?αη→ SA αλμαρα, essentially identical to the NJA incidence in 40 above. The other two examples above are clear cases of such deletion: βαδα?ατ→ βαδατ; ρυρυ:σ→ ρυρυ:σ, respectively.

In final position, and as can be seen in table 5 above, NJA speakers demonstrate a high incidence of ?-deletion (99/264; 40%). Examples:
43. Ιν ΣΑΑλλΑη (God willing) (SA Ιν Σαα?α ΛΛΑη)
44. βεΙε λέκαξα (Condolence place) (SA ?alNзаα?)
45. μιν ωαρα λ διςξααν (because of smoking) (SA ωαραα?)

These examples are quite similar to those cited by Sibawayyhi (549), e.g. ξυρυ:δΖυ λ ξαβα?α→ ξυρυ:δΖυ λ ξαβα (revealing the hidden), and φαθαδ δΖαα?α ?αΣρΑΑυηα→ φαθαδ δΖαα ?αΣρАΑυηα (its clues have appeared).

The percentages of -deletion in the NJA data according to position (0.88% initially, 4.8% medially and 40% finally) indicate that the sound is most immune against loss in initial position, and most vulnerable in final position. This is consistent with Labov's (1969) findings for t/d-deletion in General American English, and with Tamimi's (2002: 111) conclusions for h-deletion in East London English (For further detail about sound deletion with respect to different in- word-positions, see Hurford, 1967: 325 ,Pisoni and Lively 1995: 447).

Conclusions

1. Similar to that in SA, in NJA, ? is almost present in initial position, but undergoes the SA different phonological processes in both medial and final positions.

2. Unlike in SA, NJA does not show 'bayna-bayn' realization in medial position, as this involves a consequent two-consonant-cluster that NJA speakers tend to avoid. But similar to it; the realization may occur word-initial across word- boundary.

3. In NJA ?→ω occurs only in initial position, but in SA it can occur in both initial and medial positions. ?→☑: seems to be the NJA alternative in medial position, which is alien to SA. Laxing, based one some phonetic similarity between ω and ☑, may justify this choice.


5. NJA speakers show a strong tendency towards ?→ϕ in medial position when ? is preceded by the vowel ι, the same phonetic condition encouraging this process in SA. In Final position, they exhibit a relatively stronger tendency.

6. NJA speakers exhibit a relatively stronger tendency towards ?→ϕ in final position when ? is preceded by the vowel ι, a simpler phonetic condition than that in SA necessitating the presence of two glottal stops words- finally or across word boundary.

7. Just like SA, NJA provides some evidence of ?→αα in medial position, but unlike it, there is no such substitution in both initial and final positions.
8. There is a clear tendency amongst the NJA speakers towards a possible \( \rightarrow \beta \) substitution, exclusively in initial position, and some evidence of what might be categorized as \( \rightarrow \mu \) and \( \rightarrow \tau \) in the same position, alternations unfamiliar to SA.

9. Just like in SA, \( ? \)-deletion occurs in all positions in NJA, in which \( ? \)-deletion is far more frequent in final position than in medial position, but rare in initial position. The phonetic conditioning for this deletion in both medial and final positions is almost similar in both varieties, but different in initial position where NJA speakers may apply \( ? \)-deletion simply when \( ? \) is preceded by a vowel.

**End Notes**

1. The sound has been lavishly studied by ancient Arab grammarians that one could hardly find it missing in standard references.

2. Since there is no consensus amongst researchers as to the exact characterization of \( ? \), we follow the norm of referring to the sound as glottal fricative in this research.


4. If proved to be true, such alternation, may lend some support to the IPA description of the sound as glottal fricative.

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**References**


