Vowels in Initial Najdi Consonant Sequences: Phonological or Intrusive?

Omar Alkhonini[1]

[1]*Majmaah University*

Najdi Arabic is claimed to allow word-initial consonant sequences, #CC, albeit sometimes with a prothetic vowel, #vC_1C_2VX ([1]). The present study sought to determine what consonant sequences (i.e., with a rising, falling, or plateau sonority profile) could surface in Najdi without a prothetic vowel. It also investigated the differences between these projected instances of prothesis and lexical vowels in terms of duration and intensity. Additionally, Najdi participants' perception of the vowel inserted before word-initial consonant sequences was inspected to determine if it could be considered phonological epenthesis or an intrusive vowel. The study consisted of two experiments.

The first experiment tested whether lexical vowels—i.e., vowels that are an expected part of a word (#VC_1C_2X)—were produced with similar duration and intensity as prothetic vowels (#vC_1C_2X). The initial vowel was always /i/. The first set of stimuli consisted of 89 words containing an initial two-consonant sequence (#C_1C_2X) that might result in vowel prothesis. The second set consisted of 30 words containing lexical vowels in the same environment as the projected prothesis in the first set (#_C_1C_2X). All items were produced by Najdi participants once as individual words and then again in a carrier phrase. Stimuli were balanced between rising, falling, and plateau sonority ([2,3]) and sonority distance ([4]). Lexical vowels were significantly longer in duration and higher in intensity than prothetic vowels before word-initial consonant sequences in all three sonority profiles (χ^2= 61.67, p < .001) (see Figure 1). In addition, prothetic vowels inserted before rising sonority consonant sequences were far fewer than those added before falling (χ^2= 4.02, p < .001) or plateau (χ^2= 1.06, p < .05) sonority profiles. This production data suggested that the two types of vowels were acoustically distinctive.

The second experiment tested perceptions of these vowels and whether those perceptions matched participant productions. The stimuli consisted of 32 isolated nonce words with the structure #VCCVC produced by a male native Najdi speaker. The length of the initial vowel of each word was manipulated to reflect two measurements: the length of lexical vowels and the length of prothesized vowels (based on the first experiment's results). In addition, a third category was created that had the nonce words without the initial vowel; i.e., the vowel was cut out. The 346 participants chose the optimal spelling (#C_1C_2X, #VC_1C_2X, or #C_1VC_2X) for each nonce word they heard. The spelling #VC_1C_2X was chosen more often with a vowel of lexical than prothetic length (χ^2= 2.05, p < .001) and more often with prothetic length than no vowel (χ^2= 2.75, p < .001). With nonce words starting without a vowel (#C_1C_2), participants tended to hear an illusory epenthetic vowel approximately half the time (see Figure 2).

Together, the production and perception findings highlight the distinctiveness of the Najdi prothetic vowel. Although a prothetic vowel was shorter in duration and lower in intensity than lexical vowels, this study argues it is underlyingly phonological. First, the average length of the prothetic vowel was 28.83 ms. Second, the prothesis mostly targeted more marked (i.e., sonority-violating) clusters, which intrusive vowels never do cross-linguistically ([5]). Third, although they differentiated lexical from prothetic vowels, participants perceived prothetic vowels to be lexical 86% of the time (choosing the VC_1C_2X spelling). This suggested the prothetic vowel was phonological and not merely an intrusive or transitional vowel. Furthermore, the data indicated that Najdi is very restricted in word-initial consonant sequences. In terms of production, only rising sonority sequences could surface. In terms of perception, Najdi showed no underlying word-initial sequences (*/C_1C_2/); instead, it had /VC_1.C_2/, reinforcing prior findings about the simplicity of its onset structure ([6]).

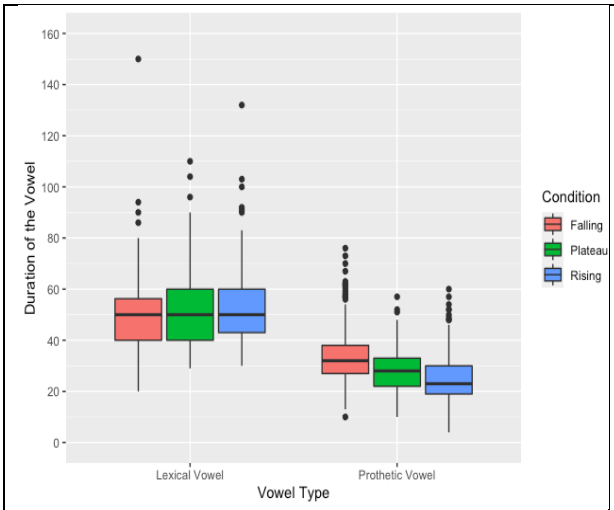

Figure 1. Duration of lexical vs. prothetic vowels.

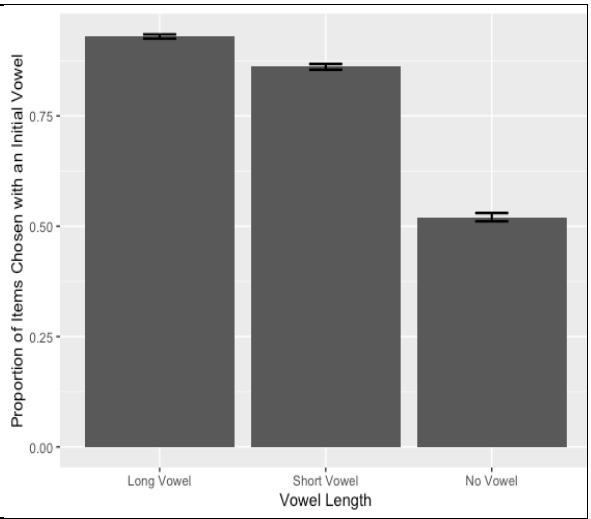

Figure 2. Orthographic choice results for long vowel vs. short vowel vs. no vowel.

References

[1] Alghmaiz, B. A. (2013). *Word-initial consonant cluster patterns in the Arabic Najdi dialect* [Master's thesis, Southern Illinois University]. https://opensiuc.lib.siu.edu/cgi/viewcontent.cgi?article=2089&context=theses

[2] Selkirk, E. (1984). On the major class features and syllable theory. In M. Aronoff, R. Oehrle, & M. Halle (Eds.), *Language sound structure: Studies in phonology, presented to Morris Halle by his teacher and students* (pp. 107–136). MIT Press.

[3] Steriade, D. (1982). *Greek prosodies and the nature of syllabification* [Unpublished doctoral dissertation]. Massachusetts Institute of Technology.

[4] Selkirk, E. (1982). The syllable. In H. van der Hulst & N. Smith (Eds.), *The structure of phonological representations* (pp. 337–383). Foris.

[5] Hall, N. (2006). Cross-linguistic patterns of vowel intrusion. *Phonology*, *23*(3), 387–429.

[6] Alkhonini, O. (2021). *Underlying representation and acoustic analyses of two-consonant initial clusters and prothesized vowels in Najdi Arabic* [Unpublished PhD Dissertation]. English Department, George Mason University.