Compensatory Lengthening Process in Borujerdi Dialect

in Optimality Theory Framework

Extended Abstract

This study examines the phonological process of **compensatory vowel lengthening** in the Borujerdi dialect, a sub-variety of the Lori language spoken predominantly in Borujerd, a city in Lorestan Province, Iran. Employing a descriptive-analytical approach, this research applies two theoretical frameworks—**Optimality Theory** and **Moraic Phonology**—to analyze the conditions under which compensatory lengthening occurs, the types of segments involved, and the specific phonological environments in which this process manifests.

Borujerd County, located in western Iran, borders several other counties, and its dialect exhibits unique phonological features that distinguish it from related Lori dialects, such as that of Khorramabad, while showing a closer affinity to Persian in many respects. The Borujerdi dialect is spoken by approximately 800,000 to one million speakers across several provinces including Lorestan, Hamedan, Markazi, and Kermanshah. This dialect's phonological characteristics, particularly regarding syllable weight and moraic structure, offer valuable insight into the interaction between segmental deletion and vowel lengthening.

Theoretical Background

The investigation is grounded in **Optimality Theory (OT)** and **Moraic Theory**, which provide a robust framework for understanding compensatory lengthening as a morphophonemic phenomenon linked to syllable weight preservation.

Optimality Theory, developed in the early 1990s by Prince and Smolensky and introduced to Iranian phonology by Dabirmoghadam, operates on the premise that surface forms are the result of competition between ranked, violable constraints. These constraints fall into two primary categories: **faithfulness constraints**, which preserve underlying representations by preventing excessive structural deviation, and **markedness constraints**, which regulate permissible phonological patterns. Unlike earlier generative frameworks where constraints were inviolable, OT allows for ranked constraints to be violated to achieve an optimal balance. This approach effectively models the competition between simplification processes such as deletion and the maintenance of syllable weight.

Moraic Phonology, on the other hand, conceptualizes syllables as composed of **moras**, units of timing or weight. Syllables are categorized as **light (one mora)**, **heavy (two moras)**, or **superheavy (three moras)**. The presence of moraic consonants and vowels directly influences syllable weight and, consequently, phonological processes like compensatory lengthening. Moraic theory thus predicts that deletion of moraic segments will often prompt lengthening of adjacent vowels as a compensatory strategy to preserve syllable weight.

Data and Analysis

The Borujerdi dialect presents two distinct types of compensatory lengthening:

1. **Lengthening triggered by the deletion of glottal consonants** /h/ and /ʔ/, which are the only moraic consonants in the dialect,
2. **Lengthening resulting from the deletion of unstressed short vowels**.

Both glottal consonants, the fricative /h/ and the stop /ʔ/, carry moraic weight in the Borujerdi dialect, a feature not common in all Iranian dialects. When these consonants are deleted—typically in coda or consonant cluster positions—the mora they carry is transferred to the preceding short vowel, lengthening it from monomoraic to bimoraic. This process preserves the overall mora count of the syllable, maintaining its phonological weight. Similarly, deletion of unstressed vowels adjacent to moraic consonants results in the neighboring vowel absorbing the freed mora, leading to compensatory lengthening.

The phonological environments in which compensatory lengthening occurs correspond partially to the three canonical contexts described by Lee S. Bickmore:

- **V_1 V_2 → Ø V_2 → [V_2ː]**: vowel deletion leading to lengthening of the following vowel,
- **V C → V Ø → [V**ː**]**: consonant deletion resulting in lengthening of the preceding vowel,
- **V C → Ø C → [C**ː**]**: consonant deletion causing lengthening of the adjacent consonant.

In Borujerdi, only the second and third contexts are prevalent, specifically with deletion of the glottal consonants /h/ and /ʔ/. Unlike some Persian dialects where glide deletion (/w/, /j/) may trigger compensatory lengthening, in Borujerdi, glide deletion does not produce this effect.

A novel finding of this study is the identification of a **fourth phonological environment** for compensatory lengthening in Borujerdi. This occurs in trisyllabic words with the structure **CV.CVC.CV(C)**, where the first of two adjacent vowels is deleted. Consequently, the following vowel absorbs the mora of the deleted vowel, resulting in its lengthening, effectively changing the syllable structure to **CV**ː**.CV(C)**. This pattern has not been previously documented in Persian dialectology and suggests an expanded functional domain for compensatory lengthening in this dialect.

Moreover, the dialect demonstrates a rare phenomenon of **discontinuous compensatory lengthening**, where the deleted moraic consonant occupies the second position in a consonant cluster within monosyllabic or disyllabic words (e.g., CVC.CV(C)). Upon deletion, compensatory lengthening affects a non-adjacent vowel, a pattern that challenges standard assumptions about locality in moraic reassignment. This type of lengthening is uncommon cross-linguistically and further distinguishes Borujerdi from Standard Persian, where such compensatory lengthening is limited mostly to monosyllabic contexts.

Implications and Conclusion

The high frequency of compensatory lengthening and its occurrence across diverse phonological contexts in the Borujerdi dialect suggest an underlying phonological motivation toward **economy and articulatory simplification**. Speakers appear to prefer deleting moraic consonants or unstressed vowels, simplifying the segmental inventory while preserving syllable weight through vowel lengthening. This phenomenon aligns with the linguistic principle of **least effort** or **minimal articulatory effort**, indicating that phonological systems strive for efficiency without sacrificing perceptual distinctiveness.

From a theoretical perspective, the results reinforce the significance of moraic structure in governing compensatory lengthening and demonstrate the explanatory power of Optimality Theory in modeling constraint interactions related to deletion and lengthening. The identification of a new phonological environment for compensatory lengthening enriches the typology of the phenomenon and highlights the importance of detailed dialectal studies in expanding universal phonological theory.

In conclusion, this study contributes both empirical data from an understudied Iranian dialect and theoretical insights into the interaction of moraic structure, segmental deletion, and compensatory lengthening. The Borujerdi dialect exemplifies how phonological processes are shaped by the interface between articulatory constraints and moraic timing units, underscoring the dynamic nature of phonological systems in response to both universal principles and local dialectal variation.