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Role of Lexical Variables in Persian Word Processing: Insights from Reaction Time and Naming Latency Data

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Abstract

This study investigates how structural, semantic, and emotional variables shape Persian word processing, a key gap in cross-linguistic psycholinguistic research. Reaction time (RT) and naming latency (NL) datasets were analyzed as complementary behavioral indices of lexical processing, drawing on multiple existing Persian norms, including Bagheri et al. (2016), Bakhtiar et al. (2013), Mahjoubnavaz et al. (2024), Mokhlesin et al. (2015), Nazari et al. (2014), Nemati et al. (2022, 2025), and Rezaei (2023). Structural predictors included word frequency, orthographic and phonological length, orthographic and phonological neighborhood size, and frequency. Semantic variables comprised familiarity, age of acquisition (AoA), concreteness, imageability, and animacy, while emotional predictors covered valence, arousal, and dominance. Generalized Additive Models (GAMs) were employed to model both linear and nonlinear effects. Frequency emerged as the most robust predictor across all models, confirming its central role in Persian lexical access. Phonological variables outperformed orthographic ones, suggesting an effect of the reduced vowel representation in Persian script. Familiarity and AoA added explanatory power beyond frequency, while other semantic variables, including concreteness and imageability, showed limited or inconsistent effects. Emotional variables exhibited weak or dataset-dependent contributions, with valence and arousal occasionally significant, and dominance non-significant. NL data essentially replicated RT patterns, except for concreteness being explanatory beyond and above frequency, but the results were less stable due to a smaller sample size. Persian patterns align with established findings in other languages, reinforcing the primacy of frequency and phonological factors. The results also underscore Persian's distinctive phonological reliance and the need for larger, standardized psycholinguistic norms. Expanding Persian lexical resources and integrating existing corpora are essential to advancing cross-linguistic modeling of word-processing mechanisms.

Keywords: Lexical variables, Word processing, Naming latency, Persian

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