THE ISSUE OF STRESS IN UZBEK PHONETICS: THEORY AND PRACTICE

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Аннотация

В этой статье рассматриваются теоретические и практические аспекты ударения (акцентуации) в узбекской фонетике с упором на его классификацию, правила размещения, фонологические модели и последствия для произношения и орфографии. Узбекский язык, как тюркский язык, представляет собой уникальную систему ударения, которая существенно отличается как от индоевропейских, так и от семитских языков. Хотя обычно считается, что в стандартных формах в нем присутствует фиксированное конечное ударение, фактический разговорный узбекский язык демонстрирует значительные вариации в зависимости от диалектных различий, синтаксической структуры, словообразования и заимствованных элементов. В статье исследуется, как ударение взаимодействует с морфологическими границами, влияет на редукцию гласных и интонацию, а также играет роль в ритме речи и дифференциации значений. Используя сочетание описательного анализа, полевых записей и корпусного обзора размещения ударения в спонтанной речи, это исследование выявляет закономерности и исключения, которые имеют педагогическое и лингвистическое значение. Практические последствия включают разработку моделей произношения для узбекского языка как иностранного и необходимость в инструментах синтеза речи, чувствительных к ударению. Результаты исследования подчеркивают необходимость интеграции фонетической теории с прикладным лингвистическим обучением и предлагают шаги по стандартизации моделей ударения в словарях и учебных материалах.

Ключевые слова. Узбекская фонетика, словесное ударение, просодия, акцентуация, тюркское языкознание, фонология, ритм речи, морфология, прикладная фонетика, варьирование ударения.

Abstract

This article investigates the theoretical and practical aspects of stress (accentuation) in Uzbek phonetics, focusing on its classification, placement rules, phonological patterns, and implications for pronunciation and orthography. Uzbek, as a Turkic language, presents a unique system of stress that differs significantly from both Indo-European and Semitic languages. While generally considered to exhibit fixed final stress in standard forms, actual spoken Uzbek shows considerable variation depending on dialectal differences, syntactic structure, word formation, and borrowed elements. The article explores how stress interacts with morphological boundaries, affects vowel reduction and intonation, and plays a role in speech rhythm and meaning differentiation. Using a combination of descriptive analysis, field recordings, and a corpus-based review of stress placement in spontaneous speech, this study reveals patterns of regularity and exceptions that are pedagogically and linguistically

significant. Practical implications include the development of pronunciation models for Uzbek as a foreign language and the need for stress-sensitive speech synthesis tools. The findings emphasize the necessity of integrating phonetic theory with applied linguistic instruction and propose steps toward standardizing stress models in dictionaries and educational materials.

Keywords. Uzbek phonetics, word stress, prosody, accentuation, Turkic linguistics, phonology, speech rhythm, morphology, applied phonetics, stress variation.

Introduction

Stress, or prosodic accentuation, plays a vital role in phonetic and phonological systems across the world's languages. It influences not only the rhythm and melody of speech but also assists in differentiating word meanings, emphasizing elements within utterances, and guiding language acquisition. In many languages, such as English or Russian, stress is phonemic—capable of altering lexical or grammatical meaning. In contrast, stress in Turkic languages, including Uzbek, has often been viewed as non-phonemic and predictable. However, recent research suggests that the picture is far more complex.

Uzbek phonetics traditionally describes stress as fixed on the final syllable in most word types. Yet, empirical data drawn from spoken language, regional dialects, poetic forms, and syntactic constructions indicate considerable flexibility. In addition to final stress, Uzbek also exhibits cases of initial and penultimate stress, particularly in borrowed words, compound formations, interrogative structures, and emphatic contexts. Furthermore, the presence or absence of stress can influence vowel length, reduction, and even segmental assimilation.

This paper aims to explore the phenomenon of stress in the Uzbek language through a dual lens: theoretical classification and practical manifestation. The key research questions guiding the study are:

1. What is the structural basis of stress assignment in standard Uzbek?
2. How does stress function in morphologically complex and borrowed forms?
3. What are the implications of stress for phonological instruction and speech technologies?

By addressing these questions, the study contributes to the broader understanding of Uzbek phonology and its relationship with both native speaker intuition and formal phonetic description. In addition, the research holds practical value for language teaching, particularly for non-native learners of Uzbek, and for computational linguistics applications such as text-to-speech systems and automatic speech recognition.

LITERATURE ANALYSIS AND METHODOLOGY

To thoroughly investigate stress patterns in Uzbek, this study employed a multi-pronged methodological approach involving theoretical phonological analysis, audio data collection, and corpus linguistics. The methods included:

1. **Theoretical Analysis**:

We reviewed major scholarly works in Uzbek and Turkic phonology, including studies by A. Madvaliev, S. Sirojiddinov, and international Turkologists such as Johanson and Kornfilt. Stress types—lexical, grammatical, emphatic—were classified, and rules regarding stress placement on different morphological categories (nouns, verbs, adjectives, particles) were synthesized.

2. **Audio Corpus Collection**:

A dataset of 1000 words and 200 utterances was compiled using field recordings of native Uzbek speakers from Tashkent, Samarkand, Fergana, and Karakalpak regions. The recordings included minimal pairs, proverbs, poetic lines, and spontaneous dialogues. Speakers were recorded under controlled conditions with high-fidelity microphones, and speech segments were annotated using Praat software to measure pitch contours, intensity peaks, and syllable duration.

3. **Corpus-Based Analysis**:

We utilized the Uzbek National Corpus (UNDC) and open-access audio materials from radio and television broadcasts to detect patterns of stress in larger discourse. Token frequency, word class, syllable structure, and context type were used as classification criteria.

4. **Perception Tests**:

20 Uzbek language learners and 10 native speakers were subjected to listening tasks involving minimally contrastive pairs differing only in stress position (real or artificially manipulated). Their interpretations were analyzed for meaning perception and phonetic sensitivity.

Data was statistically processed using RStudio for acoustic analysis and SPSS for survey evaluation. Stress salience was quantified using pitch rise (Hz), duration (ms), and relative loudness (dB), allowing for acoustic verification of intuitive stress judgments.

RESULTS

The analysis confirmed the theoretical claim that standard Uzbek generally exhibits **final stress** in isolated root words and basic morphologically simple forms. For instance, nouns such as *kitob* ("book") and *daryo* ("river") and verbs like *keladi* ("comes") reliably demonstrate terminal stress placement. However, several key patterns emerged indicating flexibility and functional variability.

1. **Borrowed Words**:

Borrowed lexical items from Russian, Persian, or Arabic often retain their original stress pattern, especially in colloquial speech. For example, *institút*, *poéziya*, and *televízor* display initial or penultimate stress, diverging from the native final-stress pattern.

2. **Compound and Derivative Forms**:

Compound nouns and words with multiple suffixes sometimes shift stress to the stem for clarity or emphasis. For example, *dáryoliklar* ("people from river regions") emphasizes the base *daryo*, not the suffix.

3. **Intonation and Sentence Stress**:

In longer utterances, sentence-level prosody frequently overrides word-level stress. Words placed at the end of a question or statement often receive stress regardless of lexical rules: *U keládi-mi?*

4. **Dialectal Variations**:

Karakalpak and Qashqadaryo dialects showed unique stress shifts, often placing stress on the first syllable or pronouns for pragmatic purposes. For example, *MÉn bilaman* instead of *men bilamán*.

5. **Phonetic Manifestation**:

In acoustic analysis, stressed syllables showed 15–25% longer duration and 20–40 Hz higher pitch compared to adjacent unstressed syllables. Vowel centralization was less common in stressed syllables, affirming their articulatory prominence.

6. **Perception Accuracy**:

Listeners identified meaning differences based on stress in 82% of test cases. However, language learners had lower accuracy when stress shifts resulted in syntactic ambiguity (e.g., *boradi* vs. *borádi* interpreted as statement vs. question).

Overall, the results suggest that Uzbek stress, while relatively predictable, is also context-sensitive and semi-functional in terms of prosodic meaning.

CONCLUSION

The findings of this study challenge the traditional classification of Uzbek as a language with fully predictable, fixed word stress. Instead, the results point to a more dynamic and context-sensitive system that integrates lexical, grammatical, and pragmatic elements. This semi-functional nature of stress in Uzbek aligns it more closely with "mixed" stress systems seen in languages like Turkish or Finnish, where morpho-prosodic factors influence accent patterns.

From a pedagogical perspective, the implication is clear: Uzbek language instruction, particularly for foreign learners, must include awareness of stress variation, not merely rote pronunciation of isolated words. In speaking fluency and comprehension, correct stress placement can affect intelligibility, naturalness, and even meaning. For example, the difference between *ko'pchilik* and *ko'pchilík* can alter whether the speaker emphasizes quantity or subject.

In applied phonetics, the results provide a framework for improving Uzbek speech synthesis systems and ASR (automatic speech recognition) tools. By incorporating stress rules into pronunciation dictionaries and prosody modules, developers can enhance machine-generated speech quality. Similarly, language testing platforms can use stress-sensitive tasks to better assess learner fluency.

The dialectal variation revealed in this study also underscores the importance of including regional data in national phonetic models. A one-size-fits-all stress description is insufficient for accurate linguistic representation. Instead, standard pronunciation should be framed as a pedagogical norm while allowing for sociolinguistic variation in authentic use.

Further research could expand this analysis into poetic metrics, discourse intonation, and speech disorders. Moreover, a comprehensive stress-marked lexicon of Uzbek would be a valuable addition to linguistic and technological resources, particularly for education and AI applications.

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