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PROSODIC FEATURE ACQUISITION IN UKRAINIAN EFL STUDENTS: A COMPARATIVE ANALYSIS USING PRAAT

The acquisition of English prosodic features presents a significant challenge for Ukrainian EFL students, particularly for those training to become English teachers. These learners must not only develop their own prosodic competence but also acquire the analytical skills necessary to help future students achieve native-like English pronunciation.

At the heart of this challenge are the fundamental differences between the prosodic systems of Ukrainian and English. Ukrainian is characterized by a syllable-timed rhythm, where syllables tend to have relatively uniform duration. In contrast, English is a stress-timed language, marked by alternating strong and weak syllables and greater variation in pitch and rhythm. This divergence in temporal organization, stress patterns, and pitch range creates systematic interference when Ukrainian speakers learn English, resulting in persistent transfer of native language features into their English speech (5, 3).

As David Crystal (1987) explains, when we encounter a foreign language, our natural inclination is to perceive and produce it using the familiar sounds and patterns of our mother tongue. This phenomenon, known as phonological interference, means that learners often interpret and articulate the target language differently from native speakers. For Ukrainian EFL students, this leads to noticeable differences in how prosodic features—such as stress, intonation, and rhythm—are realized in English.[2, p. 372]

PRAAT, a powerful tool for acoustic analysis, enables both researchers and learners to systematically examine these differences. By visualizing and quantifying pitch contours, stress placement, and rhythmic patterns, PRAAT provides objective evidence of L1 interference and highlights specific areas where Ukrainian learners diverge from native English prosody. This analysis not only deepens our understanding of the acquisition process but also informs more effective instructional strategies for developing authentic English prosody in Ukrainian EFL contexts. [1]

This study employs PRAAT acoustic analysis software to achieve three primary objectives:

1 Quantify prosodic differences between Ukrainian EFL students and native English speakers through comprehensive acoustic measurement
2 Identify systematic L1 transfer patterns in prosodic feature acquisition among Ukrainian learners
3 Develop evidence-based pedagogical recommendations for PRAAT-enhanced pronunciation instruction tailored to Ukrainian learners' specific needs

The investigation utilized a comparative acoustic analysis design, examining recordings of Ukrainian EFL students alongside native English speaker models. [4] Participants included Ukrainian 1st year EFL teacher trainees from Zhytomyr Polytechnic State University. (Fig.1 and Fig.2)

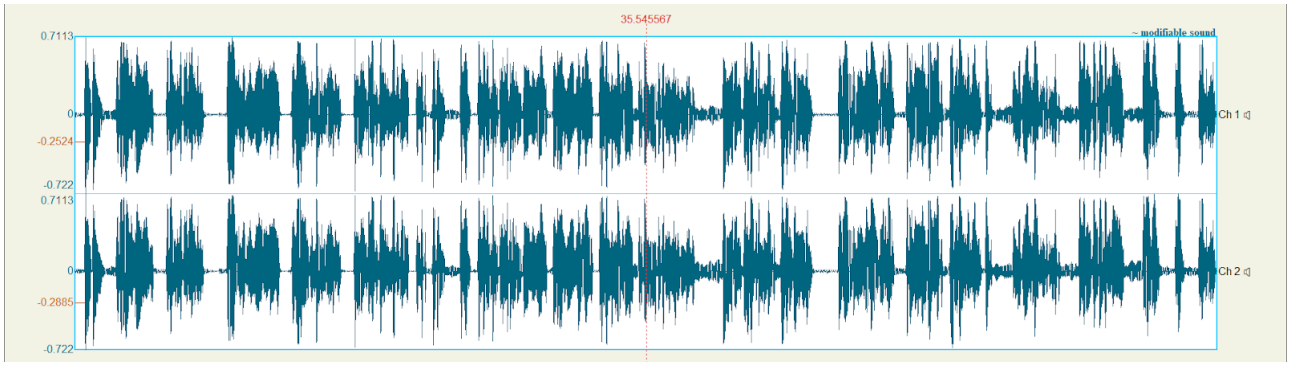

Fig.1. “I am”, a poem by John Clare read by native speaker.

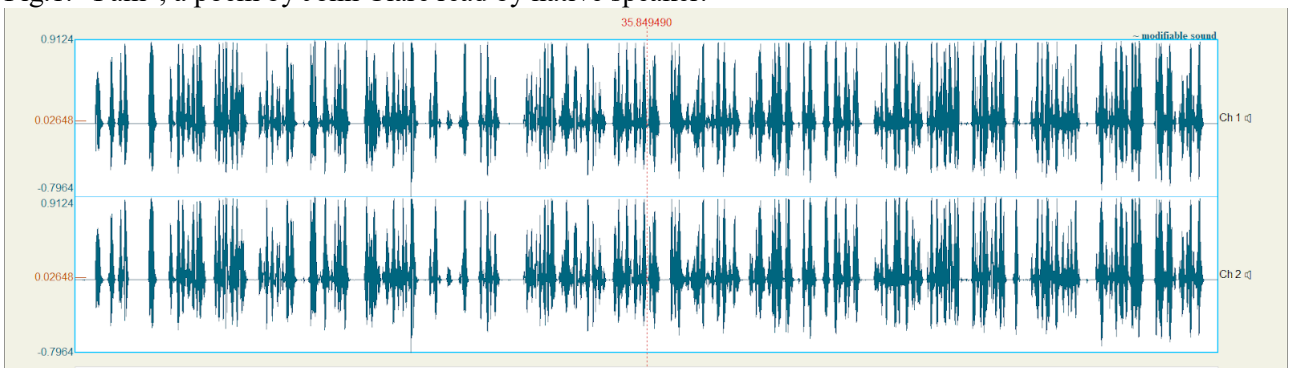

Fig.2. “I am”, a poem by John Clare read by a Ukrainian student.

PRAAT Analysis Protocol encompassed multiple prosodic parameters:

- Pitch Analysis: F0 range measurement, pitch contour tracking, intonation pattern identification
- Temporal Analysis: Speech rate calculation, pause detection and measurement, rhythmic timing assessment
- Intensity Analysis: Amplitude variation measurement, stress pattern identification
- Comparative Visualization: Side-by-side spectrographic and waveform analysis

Data collection utilized poetry reading tasks, selected for their prosodic richness and cultural relevance, including works by prominent English and American poets. Native speaker reference models were provided through professional recordings, enabling systematic comparison across identical textual material.

Pitch and Intonation Patterns: PRAAT analysis revealed dramatic differences in pitch utilization between Ukrainian students and native speakers. Ukrainian learners demonstrated significantly narrower F0 ranges (approximately 50-80 Hz) compared to native speakers (100-150 Hz), representing a 50-80% reduction in pitch dynamism. Visual analysis showed flatter, more monotonic pitch contours in Ukrainian speakers, with limited emotional expression through prosodic variation. Intonation group boundaries showed systematic deviations, with Ukrainian speakers exhibiting distinct tonal patterns that reflect L1 prosodic structure.

Temporal and Rhythmic Organization: Waveform analysis provided clear evidence of syllable-timing interference in Ukrainian speakers' English production. Ukrainian students showed more uniform amplitude across syllables, contrasting sharply with native speakers' clear stress-timing patterns visible through distinct amplitude variations. Temporal analysis revealed compressed reading pace in Ukrainian speakers, with different pause distribution patterns and shorter silent intervals compared to native models.

Stress and Accentuation Patterns: Spectrographic analysis demonstrated systematic differences in vowel reduction patterns, with Ukrainian speakers maintaining

clearer formant patterns in unstressed syllables rather than the vowel reduction characteristic of native English. This finding supports previous research indicating Ukrainian speakers' tendency to fully pronounce unstressed vowels, contributing to altered rhythmic perception.

Statistical analysis of acoustic parameters showed significant differences across all measured prosodic features:

- Pitch variability coefficients: Ukrainian speakers showed 60-70% less variation
- Intensity standard deviation: Native speakers demonstrated significantly higher amplitude variation
- Temporal compression ratios: Ukrainian speakers exhibited 15-20% faster reading rates
- Pause-to-speech ratios: Different temporal organization patterns

The research findings support a three-phase PRAAT-based training:

Phase 1: Awareness Building - Students examine side-by-side PRAAT comparisons of their recordings with native models, developing visual literacy in acoustic analysis and understanding specific prosodic targets.

Phase 2: Feature-Specific Training - Targeted exercises address identified interference patterns: pitch training (to expand pitch range), rhythm training (exercises for developing stress-timing patterns), activities for appropriate pacing and pause placement.

Phase 3: Integration Practice - Comprehensive prosodic training with objective progress tracking through acoustic measurements rather than subjective assessment.

This study provides acoustic documentation of Ukrainian-specific prosodic patterns in English acquisition. The research demonstrates PRAAT's effectiveness as both an analytical tool for identifying systematic prosodic differences and a pedagogical instrument for providing objective feedback.

The acoustic analysis confirms Valihura's (2009) findings about Ukrainian prosodic interference, including "narrowing of tonal range", "monotonic pronunciation", and temporal organization differences. [5] Visual PRAAT evidence provides concrete support for theoretical claims about Ukrainian syllable-timing influence on English rhythm acquisition.

The research demonstrates clear practical value for Ukrainian EFL instruction. PRAAT analysis enables: objective assessment of prosodic competence through quantifiable acoustic measurements, targeted instruction addressing specific Ukrainian L1 transfer patterns, progress monitoring through comparative acoustic analysis over time, self-directed learning through visual feedback on prosodic performance.

This investigation establishes PRAAT acoustic analysis as an invaluable tool for documenting and addressing EFL students' prosodic challenges. The research bridges theoretical understanding of phonetic interference with practical pedagogical applications. The findings demonstrate that Ukrainian students exhibit predictable, quantifiable prosodic differences that can be systematically addressed through technology-enhanced instruction.

The study's integration of acoustic analysis with pedagogical intervention offers both theoretical insights and practical tools for improving learner outcomes. These contributions have implications extending beyond Ukrainian contexts to the broader field of L2 pronunciation pedagogy, particularly in demonstrating how objective acoustic feedback can enhance traditional pronunciation instruction methods.

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