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Study on Dialectal Transfer in English Vowel Learning: A Case of Jinan, Shandong Province

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Abstract: As the strategic importance of English continues to grow within China's educational system, the interference effects of Chinese dialects on English phonetic acquisition have shown a notable upward trend. Specifically, learners from Shandong dialect regions serve as a paradigmatic case, where native language negative transfer exerts significant influence on their English pronunciation. This study focuses on English learners in Jinan, Shandong Province, adopting a contrastive analysis theoretical framework. By integrating qualitative research methods such as semi-structured interviews and acoustic corpus analysis, it systematically investigates the acoustic positional characteristics and discrepancies between Shandong dialect vowels and interlanguage English vowels. The study identifies three primary manifestations of negative transfer in English vowel acquisition among Shandong dialect speakers: forward displacement of back vowels, excessive centralization of schwa, and monophthongization of diphthongs. These findings inform pedagogical strategies such as articulatory visualization training, prosodic rhythm reinforcement, and diphthong decomposition exercises, offering a systematic framework to enhance pronunciation accuracy and prosodic fluency in dialect-influenced learners.

Keywords: English phonetic acquisition, Negative transfer, Shandong dialects, Contrastive analysis, Teaching efficacy

1. Introduction

The growing globalization has intensified research on the negative transfer effects of Chinese dialects on English phonetic acquisition, yet existing studies have primarily focused on southern dialects [1]. However, northern Mandarin branches like Shandong dialect remain under-researched, with extant literature predominately examining consonantal contrasts [2, 3] rather than acoustic vowel comparisons or instructional interventions.

Based on contrastive analysis theory, this study examines the negative transfer effects of Shandong dialect on English vowel acquisition and proposes targeted teaching strategies. It identifies three key issues: 1) vowel tongue position deviations; 2) weak vowel pronunciation errors; and 3) diphthong monophthongization. To address these, it suggests differentiated strategies, which offer a comparative approach for dialect-region English vowel teaching, aiding learners to overcome L1 negative transfer and improve pronunciation accuracy and prosody.

Employing a mixed-methods design, the research integrates acoustic corpus analysis of 200 hours of speech data processed via Praat software with qualitative interviews to capture both phonetic

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patterns and learner strategies. This multi-dimensional approach transcends traditional uni-dimensional phonetic studies, enabling comprehensive exploration of interference mechanisms.

This research provides a nuanced understanding of the specific challenges faced by Shandong dialect speakers in acquiring English vowels, offering valuable insights for developing effective, region-specific pronunciation instruction. Furthermore, the study's mixed-methods approach, combining acoustic analysis with qualitative data, serves as a model for investigating the complex interplay between first language dialectal features and second language phonetic acquisition, contributing to the broader field of applied linguistics.

2. Negative transfer effects of Shandong dialect on English vowel learning

2.1. Vowel tongue position deviation

2.1.1. Forward displacement of back vowels

English back vowels such as /ɔː/ (as in "law") and /uː/ (as in "goose") demand a deliberate posterior tongue positioning, where the tongue body is raised toward the back of the oral cavity, often accompanied by lip rounding. This articulatory configuration creates a resonant, low-to-mid back vowel quality that is distinct in English phonetics. In stark contrast, Shandong dialect lacks true back vowels in the same phonetic space. Instead, the dialect's vowel system tends to approximate these sounds with a more anterior tongue placement, where the tongue body remains closer to the midline of the mouth rather than retracting fully to the back. For example, the Mandarin character "哦" (ō), which is frequently used in Shandong dialect to express realization or agreement, is produced with a tongue position that is moderately forward and centralized, falling short of the posterior placement required for /ɔː/. When Shandong dialect learners encounter English back vowels, this habitual anterior tongue posture interferes with accurate articulation. The word law (/lɔː/), for instance, is often mispronounced as "拉乌" (lā wū), a phonetic approximation that combines the Mandarin "拉" (lā, with an open front vowel /a/) and "乌" (wū, a high back vowel /u/). This error stems not only from insufficient tongue retraction for /ɔː/ but also from an overcompensation in lip rounding. In English, lip rounding for /ɔː/ should be subtle, but it is often exaggerated or misaligned in dialect-influenced pronunciation. The resulting sound is a hybrid vowel that lies somewhere between /a/ and /ɔː/, lacking the deep back resonance of the target phoneme. Over time, this misplacement not only distorts individual word sounds but also disrupts the phonological contrast between back vowels and front vowels, such as /ɔː/ vs. /ɑː/ (as in "lot"), leading to potential misunderstandings in spoken communication.

2.1.2. Excessive centralization of central vowels

The English central vowel /ə/, commonly known as the schwa, is a cornerstone of the language's prosodic system, particularly in unstressed syllables where it serves as a neutral, reduced vowel. Its articulation requires a relaxed tongue positioned near the center of the mouth, with minimal muscular tension and a short, indistinct duration. In contrast, Shandong dialect—like many Chinese dialects—operates on a syllable-timed rhythm where each syllable is relatively uniform in stress and duration, with no systematic weakening of vowels in unstressed positions. The dialect's vowel inventory prioritizes clarity and fullness, even in non-initial syllables, resulting in limited exposure to vowel reduction or neutralization. This dialectal pattern leads to a pronounced over-centralization of /ə/ among Shandong learners. Instead of producing the schwa as a fleeting, relaxed sound, they tend to articulate it as a more prominent, elongated vowel resembling the Mandarin "呃" (è), which is a full-fledged central vowel with a distinct pitch and duration. For example, the word about (/əˈbaʊt/),

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which should have a weakly articulated first syllable, is often pronounced as “呃包特” (è bāo tè), with the initial /ə/ stretched into a syllable that carries almost equal stress to the subsequent /baʊt/. This over-articulation disrupts the rhythmic flow of English, which relies on the contrast between stressed and unstressed syllables to create its characteristic stress-timed rhythm. Listeners accustomed to English prosody perceive such speech as stilted and unnatural, as the excessive emphasis on weak vowels breaks the expected pattern of stress alternation. Moreover, the inability to properly reduce vowels can interfere with lexical stress accuracy; for instance, misstressing the first syllable of about not only distorts the word but also signals a lack of mastery over English intonational patterns.

2.1.3. Inadequate tongue height for /æ/

The English vowel /æ/ (as in “cat” /kæt/) is a low front vowel that requires a distinct articulatory posture: the tongue blade must depress significantly, bringing the front of the tongue close to the lower teeth, while the mouth opens widely to a nearly maximal extent. This vowel is phonemically unique in English, as it does not exist in Mandarin or Shandong dialect. The closest Mandarin counterpart is the mid-front vowel [e], as in the Mandarin “诶” (ēi), which differ in tongue height and mouth opening [4]. Unlike /æ/, /e/ is a mid-front vowel produced with a higher tongue position and a narrower oral opening, characteristics that Shandong dialect learners often transfer to English /æ/. For instance, bad /bæd/ is often mispronounced as “贝德” (bèi dé), merging with the articulation of bed /bed/. This misplacement arises from insufficient tongue lowering and restricted mouth aperture, causing /æ/ to shift upward toward /e/. Consequently, phonemic contrasts between minimal pairs like bad /bæd/ and bed /bed/ are neutralized. The perceptual overlap between /æ/ and /e/ underscores the critical need for targeted tongue height training to restore phonetic distinctiveness.

2.2. Weak vowel pronunciation pattern errors

English is a stress-timed language, meaning its rhythm is governed by the alternation of stressed and unstressed syllables, with unstressed syllables often featuring the schwa /ə/ or other reduced vowels. In contrast, Chinese, including Shandong dialect, is a syllable-timed language, where each syllable tends to be pronounced with relatively equal stress, duration, and vowel clarity, and vowel weakening in non-stressed positions is not systematic. This fundamental difference in prosodic structure creates a significant hurdle for learners, as they must unlearn the habit of treating every syllable as equally prominent. Shandong dialect learners often exhibit two types of weak vowel errors: under-weaking and vowel substitution. Under-weaking occurs when /ə/ in unstressed syllables is pronounced with too much clarity and duration, as if the syllable were stressed [5]. For example, the word banana (/bəˈnɑːnə/), which should have weak initial and final syllables (/bə/ and /nə/) with a stressed middle syllable (/nɑː/), is frequently pronounced as “巴娜娜” (bā nà nà). Here, both /ə/ syllables are articulated with full vowel quality, resembling the Mandarin “巴” (bā) and “娜” (nà), which lack the reduced quality of the schwa. This error stems from the learners’ inability to perceive the phonetic reduction in English; in their native dialect, even non-initial syllables carry distinct tones and clear vowel sounds, so the concept of a “weak” syllable with a neutralized vowel is cognitively foreign. Vowel substitution, another common issue, involves replacing /ə/ with other vowels from the learners’ native inventory, such as /a/ or /o/. For instance, the preposition of (/əv/) is often pronounced as “奥夫” (ào fū), with /ə/ replaced by a mid-back vowel /o/, which is more familiar in Shandong dialect. These errors disrupt the natural flow of English speech, as the stress-timed rhythm relies on the contrast between full vowels in stressed syllables and reduced vowels in unstressed ones. Without proper weakening, sentences sound monotonous and mechanical, lacking the melodic rise and fall

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that characterizes native-like pronunciation. Furthermore, mispronouncing weak vowels can obscure grammatical function words, such as articles (a, the) and prepositions (in, on), which are crucial for conveying meaning in English but are often reduced in connected speech, potentially leading to misunderstandings.

2.3. Monophthongization of diphthongs

English diphthongs, like /ɪə/ in "dear" and /eə/ in "hair", involve a smooth glide from one vowel quality to another, accompanied by noticeable changes in tongue position and lip shape. In contrast, Shandong dialect—like Standard Mandarin—has a limited diphthong system, primarily consisting of combinations like /ai/ and /ao/, which are pronounced with a relatively fixed starting position and minimal glide. The dialect's phonetic inventory favors monophthongs (single vowels) over dynamic vowel sequences, leading learners to perceive diphthongs as single, static vowels rather than two-part sounds [6]. This dialectal influence leads to monophthongization, where the glide in English diphthongs is either significantly shortened or completely eliminated. For example, the diphthong /ɪə/ in dear (/dɪə(r)/) is often reduced to a single high front vowel /i/, pronounced as "迪儿" (dí er) in Mandarin-influenced speech. Here, the initial /ɪ/ sound is prolonged, and the expected glide to /ə/ is absent, resulting in a sound closer to the Mandarin "迪" (dí) with a neutral final syllable. Similarly, /eə/ in hair (/heə(r)/) is simplified to a monophthong /e/ or /æ/, leading to pronunciations like "海尔" (hǎi er), which resembles the Chinese brand name but lacks the dynamic shift from /e/ to /ə/. Monophthongization not only alters the phonetic form of words but also erodes phonemic contrasts. For instance, the distinction between dear (/dɪə(r)/) and deer (/dɪə(r)/)—which is minimal in standard pronunciation—becomes even harder to perceive when both are pronounced with a monophthong /i/, potentially causing confusion in meaning. Additionally, the loss of diphthong glides affects the prosodic structure of sentences, as diphthongs often carry stress and contribute to the rhythmic contour of speech. Monophthongization can also affect word stress placement, as the dynamic nature of diphthongs is integral to the stress patterns in English, potentially leading to rhythmic inaccuracies.

3. Effective pedagogical strategies to mitigate negative transfer

3.1. Tongue position localization training for spatial perception

To address tongue position errors, teachers must design training activities that enhance learners' spatial awareness of their oral cavity. Visual aids, such as detailed diagrams of the mouth showing tongue placement for each vowel, can help learners visualize the target articulation. For example, a diagram for /ɔː/ can highlight the tongue's posterior position and the slight lip rounding, contrasting it with the anterior position of the Mandarin "哦" (ō). Video demonstrations, either by the teacher or professional models, allow learners to observe the subtle movements of the tongue and lips, which are often imperceptible in audio-only instruction. Tactile exercises are equally important for kinesthetic learners. For /æ/, teachers can instruct students to place the tip of their tongue behind the lower teeth and press the blade of the tongue downward, encouraging a wider mouth opening. Using a mirror to check lip and tongue posture helps learners self-correct, while exercises like holding a pencil between the teeth to maintain mouth openness during /æ/ production can build muscle memory. Minimal pair drills, such as ship /ʃɪp/ vs. sheep /ʃiːp/, force learners to focus on subtle tongue height differences, reinforcing the distinction between front vowels and preventing anteriorization errors in back vowels. Additionally, the training can be expanded to include more practice examples targeting different vowel contrasts, such as the contrast between /ɑː/ (as in "car") and /ʌ/ (as in "cup").

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3.2. Prosodic annotation and weak vowel reinforcement for rhythmic patterns

To train learners in weak vowel pronunciation, teachers should incorporate prosodic annotation into text, using symbols like dots or underscores to mark unstressed syllables containing /ə/. For example, the word about can be written as /əˈbaʊt/, with the weak syllable visually distinguished. This visual cue helps learners recognize where weakening should occur, bridging the gap between their native syllable-timed intuition and English stress-timed rhythm. Rhythmic drills, such as chanting sentences with exaggerated stress patterns, help internalize the rhythm. A sentence like "About a banana" can be chanted with the stressed syllables emphasized and the weak /ə/ syllables whispered or spoken softly, creating a clear contrast. Gradually reducing the exaggeration as learners improve allows them to transition to more natural pronunciation. Speech speed exercises, starting slowly and increasing tempo, help automate weak vowel production, as faster speech forces learners to reduce unstressed syllables to maintain fluency. Over time, this builds muscle memory for the prosodic patterns, making weak vowel pronunciation feel intuitive rather than forced. Furthermore, more diverse practice formats can be incorporated, such as tongue twisters and role-play activities, aiming to enhance learners' interest and engagement.

3.3. Contrastive listening and glide decomposition for diphthong production

Contrastive listening exercises are essential for enhancing perceptual awareness of diphthongs. Teachers can play audio clips of monophthongs and diphthongs side by side—for example, /i/ vs. /ɪə/—and ask learners to identify the number of vowel sounds they hear. This trains them to notice the dynamic glide in diphthongs, which their native dialect may have conditioned them to ignore. Visualizing the vowel trajectory on a spectrogram can also help, as the changing frequency patterns of diphthongs are visually distinct from the steady state of monophthongs. Decomposing diphthongs into their component parts allows learners to master each segment before combining them. For /ɪə/, students can first practice the starting vowel /ɪ/, holding it for a moment, then gliding smoothly to /ə/, focusing on the tongue's movement from a high front to a central position. Using mirror feedback to monitor lip changes—such as the slight spreading for /ɪ/ and relaxation for /ə/—ensures accurate articulation. Pairing this with minimal pair practice, such as dear vs. deer (both /dɪə(r)/ in standard pronunciation but often distinguished by learners through improved diphthong control), reinforces the importance of the glide in maintaining phonemic integrity. Over time, these strategies help learners overcome the monophthongization tendency and produce diphthongs with the necessary dynamic range, enhancing both clarity and naturalness in their speech.

4. Conclusion

This study focuses on the negative transfer effects of Shandong dialect on English vowel learning, systematically revealing three core issues within the framework of contrastive analysis: positional deviations including anterior displacement of back vowels, excessive centralization of central vowels, and insufficient tongue height for /æ/; prosodic conflicts caused by inadequate weak vowel reduction or substitution; and loss of phonetic dynamics due to monophthongization of diphthongs. Through acoustic corpus analysis and semi-structured interviews, the research proposes targeted pedagogical strategies—such as tongue-position localization training, prosodic annotation reinforcement, and diphthong decomposition exercises—offering actionable solutions for English phonetic teaching in dialect-speaking regions.

However, the study has certain limitations. First, while the sample was collected primarily from Jinan, representing typical characteristics of Shandong dialect, it does not cover dialectal variations in other regions (e.g., Jiaodong, Luxinan), potentially limiting the regional generalizability of the conclusions. Second, the focus on vowel systems overlooks the interference of consonants and the

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exploration of suprasegmental features such as intonation and stress, thus failing to comprehensively address the multidimensional impacts of dialectal negative transfer. Additionally, the empirical effectiveness of the proposed teaching strategies has not been validated through long-term intervention experiments, leaving the individual differences and dynamic adjustment mechanisms in practical application untested.

Future research could expand the sample scope to include various Shandong sub-dialects and incorporate cross-dialectal comparisons for enhanced regional adaptability, while also broadening research dimensions to include consonantal systems, intonation, and discourse prosody for a comprehensive model of dialectal negative transfer. Additionally, long-term educational experiments could track the effects of teaching strategies to develop personalized intervention programs, offering precise theoretical support and practical guidance for phonetic teaching in multilingual contexts.

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