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Exploring the Negative Transfer Effect of Hanzhonghua Accent on English Pronunciation and Countermeasures Against it: A Case Study of an English Major from Shaanxi Province

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Abstract

Pronunciation is a crucial aspect of second language acquisition, directly affecting comprehensibility, fluency, and communication effectiveness. However, many English learners struggle with pronunciation due to the influence of their first language or regional dialects. This study explores the negative transfer effect of the Hanzhonghua accent on English pronunciation through a case study of an English major from Shaanxi Province, China. It aims to analyze phonetic interference and explore training solutions. The research combines qualitative and quantitative methods: phonetic transcription of a participant's recording to identify errors, and a survey to assess intelligibility and communication impact. Results show the accent reduces intelligibility, with listeners understanding only 53.83% of the passage. It affects pronunciation quality by 66% and hinders communication by 60.92%. Key issues are divided into two parts: segmental errors and suprasegment errors. To address these, the study proposes a structured phonetic training approach. It highlights the need for targeted training in dialect-sensitive contexts, contributing empirical evidence on dialectal interference.

Keywords: Negative Transfer; Hanzhonghua Accent; English Pronunciation; Phonetic Training; Second Language Acquisition

1. Introduction

Pronunciation plays a crucial role in second language acquisition (SLA) as it directly affects intelligibility, fluency, and communication effectiveness. Accurate pronunciation not only facilitates clear speech production but also impacts a speaker’s confidence and comprehensibility in real-life conversations (Celce-Murcia et al., 2010). However, for Chinese learners of English, phonological differences between Chinese dialects and English often lead to pronunciation difficulties. Among these dialects, Hanzhonghua, a subdialect of Southwestern Mandarin spoken in Hanzhong, Shaanxi Province, has unique phonetic characteristics that can significantly

interfere with English pronunciation. The negative transfer of a learner's first language (L1) phonology into a second language (L2) is a well-documented phenomenon in SLA research. Studies on phonetic interference suggest that when learners encounter unfamiliar phonemes in the target language, they tend to substitute these sounds with the closest equivalents from their native dialect (Lado, 1957). This process, known as negative transfer, can lead to persistent pronunciation errors that reduce intelligibility and fluency. In the case of Hanzhonghua speakers, their distinctive vowel and consonant articulations, as well as suprasegment features, pose significant challenges for English pronunciation.

Therefor, this study aims to investigate the negative transfer effect of the Hanzhonghua accent on English pronunciation and propose effective countermeasures to mitigate its impact. The research is guided by the following objectives: (1) to identify the specific phonetic features of Hanzhonghua that interfere with English pronunciation; (2) to analyze the extent to which the Hanzhonghua accent affects intelligibility and perceived English quality, based on listener feedback; and (3) to develop and evaluate phonetic training methods that can help learners reduce accent-related pronunciation errors. The study seeks to answer the following questions: (1) What are the most common pronunciation errors caused by the negative transfer of the Hanzhonghua accent? (2) How does this accent influence listener comprehension and perceptions of English quality? (3) What phonetic training strategies can effectively address these pronunciation difficulties?

This study contributes to the growing body of research on dialectal interference in English pronunciation by providing empirical data on Hanzhonghua speakers. While previous studies have examined general Chinese-English phonetic transfer, limited research has focused on regional dialectal influences. By pinpointing specific segmental and suprasegmental pronunciation issues, this study offers insights that can enhance English language teaching (ELT) methodologies in dialect-speaking regions. Furthermore, the study has practical implications for English learners, educators, and curriculum developers. By identifying effective pronunciation training techniques, the findings can help language instructors design targeted pronunciation curricula that cater to students from diverse linguistic backgrounds.

2. Literature Review

2.1. Negative Transfer in Second Language Acquisition

Language transfer, a key concept in second language acquisition (SLA), refers to the influence of a learner's first language (L1) on the acquisition of a second language (L2). According to Lado (1957), when the phonetic, syntactic, or lexical features of L1 differ significantly from those of L2, learners often experience negative transfer, leading to persistent errors. Phonetic transfer is particularly pronounced because pronunciation habits formed in early childhood can be difficult to change.

Odlin (1989) classifies negative transfer effects into two main types:

(1) Segmental errors, which involve mispronunciations of individual sounds due to phonemic

differences between L1 and L2.

(2) Suprasegmental errors, which include issues related to intonation, stress, and rhythm, often causing unnatural speech patterns.

Studies on Chinese learners of English have shown that negative transfer occurs when learners substitute English phonemes with their closest approximations in Mandarin or regional dialects (Hao, 2020). For example, many Chinese speakers struggle with the /θ/ and /ð/ sounds, replacing them with /s/ and /d/ respectively, because these phonemes do not exist in Mandarin or most Chinese dialects (Deterding, 2006).

2.2. Dialectal Influence on English Pronunciation

While Standard Mandarin (Putonghua) serves as the official language in China, regional dialects exhibit significant phonological variations, leading to further challenges in English pronunciation. Several studies have explored how different Chinese dialects interfere with English phonetics:

(1) Northern Mandarin Accents: Research by Huang (2023) found that Liaoning learners tend to add rhotic sounds to English words, mimicking their regional accent's influence. Additionally, some speakers extend final syllables, disrupting natural English prosody.

(2) Southern Dialects: Cantonese and Hokkien speakers often have difficulty distinguishing between /l/ and /n/ and may omit final consonants, affecting their English clarity (Chan & Li, 2000).

(3) Southwestern Mandarin Variants: Wu & Yang (2014) identified specific phonetic deviations in Hanzhonghua speakers, particularly in vowel pronunciation and consonant articulation. Their research suggested that speakers of Hanzhonghua frequently confuse /n/ and /l/ and struggle with certain vowel distinctions, which may hinder their ability to produce clear English sounds.

2.3. Phonetic Features of Hanzhonghua and Their Impact on English Pronunciation

Hanzhonghua, a subdialect of Southwestern Mandarin, differs from Standard Mandarin in several key phonetic aspects that may negatively transfer to English pronunciation:

2.3.1. Vowel System Differences

Hanzhonghua exhibits a reduced vowel inventory compared to English, leading to vowel substitution errors in L2 speech:

(1) Merging of front vowels: Hanzhonghua speakers may struggle to distinguish /æ/ and /ɪ/, leading to errors such as salley (/ˈsæli/) pronounced as [ˈsɪli].

(2) Overuse of back vowels: Sounds like /ʌ/ and /ɑː/ are often replaced with a single back vowel, making words like love (/lʌv/) sound like lava (/lɑːvə/).

(3) Simplification of diphthongs: The English diphthong /əʊ/ is often replaced by a monophthong [u:], causing words like grow (/grəʊ/) to be pronounced as gru: [gru:].

2.3.2. Consonant Substitution Patterns

(1) Dental fricatives /θ/ and /ð/ do not exist in Hanzhonghua, leading speakers to replace them with /s/ and /d/ respectively (e.g., the /ðə/ → [də]).

(2) Final consonant deletion: Many Hanzhonghua speakers omit final consonants, particularly in words ending in -d or -t (e.g., field /fiːld/ → [fiːl]).

2.3.3. Suprasegmental Features

Hanzhonghua exhibits a flatter intonation pattern compared to English, leading to:

(1) Monotonous speech delivery, reducing expressiveness.

(2) Lack of stress distinction, making spoken English sound unnatural.

These phonetic traits can significantly impact intelligibility and communication effectiveness, necessitating targeted pronunciation training.

3. Methodology

This study employs a case study approach to examine the negative transfer effect of the Hanzhonghua accent on English pronunciation. The research integrates phonetic analysis and perception-based evaluation through recordings and listener assessments.

3.1. Research Design

The study is qualitative and quantitative in nature, focusing on both phonetic deviations and perceptual evaluations. It consists of the following steps:

(1) Pronunciation Recording and Phonetic Analysis: The participant read a 91-word passage, which was analyzed to identify pronunciation errors.

(2) Perception-Based Assessment: A questionnaire survey was conducted among seven college students to evaluate the intelligibility and perceived quality of the speaker's English.

(3) Error Classification and Discussion: The identified errors were categorized into segmental (vowel/consonant) and suprasegmental (intonation, stress) deviations, followed by an analysis of their impact on comprehensibility.

3.2. Participant Selection

The participant is a 20-year-old English major from Hanzhong, Shaanxi Province, who has spoken Hanzhonghua as their first language since childhood. The subject was chosen based on the following criteria:

(1) Strong Hanzhonghua Accent: The participant's English exhibits clear phonetic characteristics influenced by Hanzhonghua.

(2) Intermediate English Proficiency: The subject has received formal English education but continues to struggle with pronunciation.

3.3. Data Collection Methods

3.3.1. Pronunciation Recording and Phonetic Transcription

The participant was asked to read the following 91-word passage aloud:

DOWN BY THE SALLEY GARDENS

"Down by the Salley gardens my love and I did meet;

She passed the Salley gardens with little snow-white feet.

She bid me take love easy, as the leaves grow on the tree;

But I, being young and foolish, with her did not agree.

In a field by the river my love and I did stand,

And on my leaning shoulder she laid her snow-white hand.

She bid me take life easy, as the grass grows on the weirs;

But I was young and foolish, and now I am full of tears."

(William Butler Yeats, 1888)

The recording was phonetically transcribed, comparing the standard pronunciation with the participant's pronunciation to identify systematic errors.

3.3.2. Listener Perception Test (Questionnaire Survey)

According to Munro and Derwing (1995), listener familiarity with specific accents can increase tolerance for non-native features and potentially skew evaluations. To enhance the objectivity of future perception assessments, listeners with minimal or no prior exposure to Hanzhonghua dialect are selected, including native Standard Mandarin speakers and native English speakers.

A questionnaire-based assessment was conducted with 50 volunteers (10 native English speakers, 20 native Standard Mandarin speakers, 20 native Cantonese speakers with good spoken English). The listeners were asked to evaluate the speaker's pronunciation based on three criteria:

(1) Comprehensibility: How much of the passage they could understand.

(2) Accent Interference: The extent to which the accent affected the quality of English.

(3) Communication Difficulty: The degree to which the accent hindered normal communication.

The results were quantified using a Likert scale (0-100%), with lower scores indicating greater difficulties in comprehension and communication.

3.4. Data Analysis

The collected data was analyzed through two primary methods:

(1) Phonetic Analysis: Segmental and suprasegmental errors were categorized, focusing on vowel shifts, consonant substitutions, and prosodic features.

(2) Statistical Evaluation: Questionnaire responses were averaged to determine overall perceptions of pronunciation quality.

3.5. Justification of Case Selection and Pronunciation Task

This study adopts a single-case design, focusing on an English major from Hanzhong, Shaanxi Province, whose spoken English exhibits marked features of L1 dialect interference. The decision to focus on a single participant is grounded in the goals of exploratory phonetic research. According to Duff (2008), single-case studies are particularly useful for capturing complex, context-dependent phenomena, especially in under-explored linguistic settings. In pronunciation research, such designs allow for a detailed, fine-grained analysis of individual learners' speech production and accent features (Yin, 2018). Moreover, they enable researchers to trace specific L1-to-L2 phonological transfer patterns that may be diluted or overlooked in group studies (McKay, 2006).

Although the generalizability of findings is limited in single-subject designs, the approach is valuable in highlighting representative linguistic behaviors, especially when the goal is not statistical inference but phonetic insight (Mackey & Gass, 2016). The selected participant demonstrated a strong Hanzhonghua accent and consistent pronunciation difficulties, making them an ideal case for investigating the phonological impact of regional dialect on English speech. Such depth-oriented case studies often serve as pilot work for broader, mixed-method research or comparative studies involving multiple dialect speakers.

And the pronunciation task selected for this study is the poem "Down by the Salley Gardens" by W. B. Yeats. The rationale for choosing this poem lies in its rich combination of phonetic and prosodic features. It contains a variety of English vowels, consonants, and diphthongs—including sounds that are often mispronounced by Chinese learners, such as [ð], [v], [æ], and [əʊ]—making it highly suitable for detecting segmental errors (Celce-Murcia et al., 2010). In addition, its clear rhythmic structure and predictable stress patterns offer a strong foundation for analyzing suprasegmental features like intonation, stress, and rhythm (Murphy, 2017).

What's more, unlike word lists or isolated sentences, poetry provides a semi-natural context in which learners produce connected speech, thus allowing researchers to observe fluency, pausing, and phrasing (Gilbert, 2008). The poem's moderate length and familiar thematic content reduce cognitive load, helping participants focus on pronunciation rather than comprehension. Therefore, both the case and the task were carefully chosen to optimize the accuracy and depth of accent-related error analysis.

4. Results

This section presents the findings of the study, including quantitative results from the listener perception test and qualitative phonetic analysis of the participant's pronunciation errors. The results are categorized into comprehensibility, accent interference, and communication difficulty, followed by a detailed phonetic transcription and error classification.

4.1. Listener Perception Test Results

4.1.1. Summary of Questionnaire Responses

The questionnaire results from 50 volunteers who evaluated the participant's pronunciation are summarized in Table 1.

Table 1. Questionnaire Results

Question	Average Score (%)
Comprehensibility (Q1): How much of the passage could you understand?	53.83
Accent Interference (Q2): To what extent did the accent affect the quality of English?	66
Communication Difficulty (Q3): How much did the accent hinder normal communication?	60.92

4.1.2. Key Observations from the Questionnaire

(1) Low comprehensibility (53.83%): On average, listeners understood less than half of the passage. Two listeners even reported that they initially did not recognize the passage as English.

(2) Strong accent interference (66%): The speaker's accent significantly reduced the perceived quality of English.

(3) High communication difficulty (60.92%): Listeners found it challenging to understand and engage with the speaker due to pronunciation deviations.

These results highlight the negative impact of the Hanzhonghua accent on English intelligibility and communication, reinforcing the need for targeted pronunciation training.

4.2. Phonetic Analysis of Pronunciation Errors

The participant's pronunciation was transcribed and compared with Standard English phonetic transcription. Systematic errors were identified and categorized into segmental (vowel/consonant) and suprasegmental (intonation, rhythm, stress) deviations.

Standard Pronunciation:

/dɑʊn baɪ ðə ˈsæli ˈgɑːrdnz maɪ lʌv ənd aɪ dɪd miːt/

/ʃiː pɑːst ðə ˈsæli ˈgɑːrdnz wɪð ˈlɪtl snəʊ-ˌwaɪt fiːt/

/ʃiː bɪd miː teɪk lʌv ˈiːzi, æz ðə liːvz grəʊ ɒn ðə triː/

/bʌt aɪ, ˈbiːɪŋ jʌŋ ənd ˈfuːlɪʃ, wɪð hər dɪd nɒt əˈgriː/

/ɪn ə fi:ld baɪ ðə ˈrɪvə maɪ lʌv ənd aɪ dɪd stænd/

/ænd ɒn maɪ ˈli:nɪŋ ˈʃəʊldə ʃi: leɪd hər snəʊ-ˌwaɪt hænd/

/ʃi: bɪd mi: teɪk laɪf ˈi:zi, æz ðə grɑ:s grəʊz ɒn ðə wɪrz/

/bʌt aɪ wəz jʌŋ ənd ˈfu:lɪʃ, ənd naʊ aɪ əm fʊl əv tɪəz/

Participant's Pronunciation (The error sections are underlined.):

[dɑʊn baɪ də ˈsɪli ˈgɑ:rdnz maɪ lɑ: ənd aɪ dɪd mi:t]

[ʃi: pɑ:st də ˈsɪli ˈgɑ:rdnz wɪs ˈlɪtl sləʊ-ˌwaɪt fit]

[ʃi: bɪd mi: teɪk lɑ: ˈi:zi, æz də li:vz gru: ɒn də tri:]

[bʌt aɪ, ˈbi:ɪŋ jʌŋ ənd ˈfɔ:rlɪʃ, wɪs hər dɪd nɒ əˈgreɪ]

[ɪn ə fi:l baɪ də ˈrɪvə maɪ lɑ: ənd aɪ dɪd stɑ:nd]

[ænd ɒn maɪ ˈli:nɪŋ ˈʃəʊldə ʃi: leɪd hər sləʊ-ˌwaɪt hɑ:]

[ʃi: bɪd mi: teɪk laɪf ˈi:zi, æz də grɑ:s gru:z ɒn də wɪrz]

[bʌt aɪ wəz jʌŋ ənd ˈfɔ:rlɪʃ, ənd nəʊ aɪ əm fɔ:r əv tɪəz]

4.2.1. Segmental Errors (Vowel and Consonant Deviations)

Table 2. Vowel Substitutions

Word	Standard Pronunciation	Participant's Pronunciation	Error Type
salley	/ˈsæli/	/ˈsɪli/	[æ]→[ɪ] (front vowel shift)
love	/lʌv/	/lɑ:v/	[ʌ]→[ɑ:] (central-to-back vowel shift)
grow	/grəʊ/	/gru:/	[əʊ]→[u:] (diphthong simplification)
stand	/stænd/	/stɑ:nd/	[æ]→[ɑ:] (front-to-back vowel shift)
feet	/fi:t/	/fɪt/	[i:] → [ɪ] (long-to-short vowel substitution)
foolish	/ˈfu:lɪʃ/	/ˈfɔ:lɪʃ/	[u:] → [ɔ:] (Back Vowel Shift)
full	/fʊl/	/fɔ:l/	[ʊ] → [ɔ:] (Back Vowel Shift)

Word	Standard Pronunciation	Participant's Pronunciation	Error Type
now	/naʊ/	/nəʊ/	[æ] → [ɑː] (Front-to-Back Shift)
hand	/hænd/	/hɑːnd	[æ] → [ɑː] (Front-to-Back Shift)
agree	/əˈgriː/	/əˈgreɪ/	[iː] → [eɪ] (Vowel Quality & Length Change)

4.2.1.1. Vowel Error Analysis and Summary:

The phonetic analysis revealed 10 vowel mispronunciations, affecting front vowels, central vowels, back vowels, and diphthongs. These errors align with the phonetic characteristics of the Hanzhonghua accent, indicating a strong negative transfer effect from the speaker's first language (L1) to English pronunciation.

(1) Front Vowel Errors

- [æ] → [ɪ] or [ɑː]

Example words: salley (/ˈsæli/) → [ˈsɪli], stand (/stænd/) → [stɑːnd]

Analysis: The speaker fails to maintain the distinction between /æ/ and other vowels. The substitution of [æ] with [ɪ] results in a raised tongue position, while the [æ] → [ɑː] shift indicates a tendency to use back vowels instead of front vowels. This pattern aligns with findings from Wu & Yang (2014), who noted similar front vowel confusion among Hanzhonghua speakers.

- [iː] → [ɪ]

Example word: feet (/fiːt/) → [fɪt]

Analysis: The speaker shortens the long vowel [iː] to its lax counterpart [ɪ], which reduces vowel contrast and affects intelligibility. This reflects a common issue among Chinese learners of English, as noted by Deterding (2006), where long-short vowel distinctions are often overlooked.

- [iː] → [eɪ]

Example word: agree (/əˈgriː/) → [əˈgreɪ]

Analysis: This shift suggests an incorrect vowel quality and length change, likely influenced by Mandarin's limited vowel distinctions. The substitution of [iː] with [eɪ] disrupts the natural pronunciation of the word.

(2) Central Vowel Errors

- [ʌ] → [ɑː]

Example words: love (/lʌv/) → [lɑːv], hand (/hænd/) → [hɑːnd]

Analysis: The speaker replaces the central vowel [ʌ] with the back vowel [ɑː], making words sound unnaturally "heavy" or elongated. This issue likely stems from the absence of a clear /ʌ/ sound in Hanzhonghua, causing the speaker to approximate it with a back vowel.

(3) Back Vowel Errors

- [uː] → [ɔː]

Example word: foolish (/ˈfuːlɪʃ/) → [ˈfɔːrlɪʃ]

Analysis: The substitution of [uː] with [ɔː] results in a more open and back articulation, indicating difficulty maintaining the high, rounded vowel [uː].

- [ʊ] → [ɔː]

Example word: full (/fʊl/) → [fɔːl]

Analysis: Similar to the [uː] → [ɔː] error, this mispronunciation suggests a preference for back vowels over rounded vowels, likely due to L1 influence.

(4) Diphthong Errors

- [əʊ] → [uː]

Example word: grow (/grəʊ/) → [gruː]

Analysis: The diphthong [əʊ] is simplified into a monophthong [uː], reducing vowel movement. This reflects a common trait among Chinese learners, where diphthongs are often over-simplified into single vowel sounds (Duanmu, 2007).

- [aʊ] → [əʊ]

Example word: now (/naʊ/) → [nəʊ]

Analysis: The back diphthong [aʊ] is replaced with [əʊ], which alters the natural pronunciation pattern of the word. This suggests a difficulty in maintaining diphthong dynamics, a pattern observed in previous studies on Chinese English learners.

4.2.1.2. Summary of Vowel Errors

(1) The speaker struggles with vowel distinctions, particularly front and central vowels.

- [æ] is often replaced with [ɪ] or [ɑː], weakening vowel contrast.
- [ʌ] is replaced with [ɑː], leading to unnatural word pronunciation.

(2) Diphthongs are consistently simplified into monophthongs.

- [əʊ] → [uː] and [aʊ] → [əʊ], making words sound flatter and less dynamic.

(3) Long vowels tend to be shortened or misarticulated.

- [iː] → [ɪ] (feet → [fɪt])
- [iː] → [eɪ] (agree → [əˈgreɪ])

(4) The preference for back vowels affects clarity.

- The speaker overuses [ɑː] and [ɔː], altering word pronunciation.

These findings confirm that the Hanzhonghua accent negatively affects vowel pronunciation in English, leading to reduced intelligibility and unnatural articulation.

Table 3. Consonant Errors

Word	Standard Pronunciation	Participant's Pronunciation	Error Type
the	/ðə/	/də/	[ð] → [d] (dental fricative to alveolar stop shift)
with	/wɪð/	/vɪs/	[ð] → [s], [w] → [v] (fricative shift & Glide-to-Fricative Shift)
snow	/snəʊ/	/sləʊ/	[n] → [l] (nasal-liquid confusion)
not	/nɒt/	/nɒ/	Final /t/ deletion
field	/fiːld/	/fiːld/	Final /d/ deletion

4.2.1.3. Consonant Error Analysis and Summary

The phonetic analysis revealed five major types of consonant errors, which align with the phonetic characteristics of Hanzhonghua. These errors affect both individual phonemes and syllable structures, reducing intelligibility.

(1) Dental Fricative to Alveolar Stop Shift

- [ð] → [d]

Example words: the (/ðə/) → [də], with (/wɪð/) → [vɪs]

Analysis: The speaker replaces the voiced dental fricative [ð] with the alveolar stop [d], which is a common error among Chinese learners. Hanzhonghua does not have /θ/ or /ð/ sounds, leading to a natural substitution with the closest available phoneme in the L1 inventory. Similar patterns have been observed in Cantonese and Mandarin speakers (Deterding, 2006).

(2) Fricative Shift & Glide-to-Fricative Shift

- [ð] → [s], [w] → [v]

Example word: with (/wɪð/) → [vɪs]

Analysis: The substitution of [ð] with [s] suggests that the speaker perceives [ð] as a non-voiced fricative, leading to confusion. Additionally, the shift of [w] to [v] indicates a difficulty in maintaining bilabial glides, which are less common in Hanzhonghua.

(3) Nasal-to-Liquid Shift

- [n] → [l]

Example word: snow (/snəʊ/) → [sləʊ]

Analysis: The mispronunciation of [n] as [l] aligns with Wu & Yang's (2014) findings that Hanzhonghua speakers often confuse these two phonemes. This reduces nasal airflow, affecting word clarity.

(4) Final Consonant Deletion

- Final /t/ and /d/ deletion

Example words: not (/nɒt/) → [nɒ], field (/fiːld/) → [fiːl]

Analysis: The deletion of final stops like /t/ and /d/ weakens syllable structure, making speech sound incomplete. This is a common issue among Chinese learners, as final consonants are less frequent and less pronounced in Mandarin and Hanzhonghua (Duanmu, 2007).

4.2.1.4. Summary of Consonant Errors

(1) Dental fricatives ([ð]) are consistently replaced with stops ([d]) or other fricatives ([s]), reducing phoneme contrast.

(2) Glide-to-fricative shifts ([w]→[v]) occur, affecting smoothness in articulation.

(3) Nasal-liquid confusion ([n]→ [l]) is prominent, reflecting a key phonological feature of Hanzhonghua.

(4) Final consonant deletion is common, leading to weakened syllable structure and reduced speech clarity.

These findings also confirm that Hanzhonghua speakers face significant challenges in maintaining English consonant distinctions, impacting intelligibility and fluency.

4.2.2. Suprasegmental Errors (Intonation, Rhythm, and Stress)

Allen (1971) provides a broad definition of intonation, describing it as a linguistic feature that encompasses both rhythm and melody. It is created through variations in pitch, loudness, stress, and pause duration. In this context, intonation is similar to the concepts of prosody or suprasegmental features. This broad perspective on intonation is commonly accepted, as it typically refers to the manner in which speech is delivered. In English, the way something is spoken involves not only pitch changes but also factors such as duration, intensity, and voice quality (John, 1999).

The intonation of the English language is capable of conveying a speaker's emotions and attitudes, such as joy, anger, sorrow, affirmation, negation, delight, surprise, sadness, anger, indifference, and reticence. Therefore, expressing the speaker's emotions and attitudes is the most

common and universal function of English intonation, and it is one of the functions that can be most readily understood by the audience (Vaissière, 2022).

In general, grammatical stress follows the principle of stressing content words and reducing function words (Burzio, 1994). Most native English speakers consider it unnatural if every word is stressed while reading or speaking English (Eisenstein, 1983). More importantly, English learners, if unfamiliar with the weakened forms of these function words, will find it difficult to understand what native speakers say, especially when the speech is delivered at a fast pace (Haynes, 2007).

The original material is derived from the poem "Down By the Salley Gardens" by the poet William Butler Yeats (Yeats, 2000). It depicts a willow garden by a river in Sligo, in the west of Ireland, which serves as a place for young lovers to meet. The poem is imbued with the beauty and tenderness of love, with the final lines subtly expressing a sense of regret. The entire poem consists of declarative sentences, with a falling intonation at the end of most sentences. Rising intonation is used only at certain pauses within sentences and after some nouns to indicate a sense of beauty.

In addition to segmental errors (vowel and consonant mispronunciations), the participant exhibited significant suprasegmental (mainly prosodic) errors, affecting intonation, stress, and rhythm. These errors contribute to unnatural speech patterns, reduced intelligibility, and communication difficulties.

Table 4. Suprasegmental Error Statistics

Example	Standard Pronunciation	Participant's Pronunciation	Error Type
She bid me take love easy.	Rising-Falling pattern	Flat or incorrect intonation	Monotonous pitch
*She **bid** me take **love** easy.*	Stressed syllables are more prominent	No stress differentiation	Equal stress on all syllables
Down by the Salley gardens.	Stress-timed rhythm	Each syllable given equal duration	Syllable-timed instead of stress-timed
And on my leaning shoulder she laid her snow-white hand.	Smooth flow of speech	Hesitation after "and" and "laid"	Unnatural pauses

The analysis of suprasegmental features in the participant's speech reveals four major pronunciation issues: flat intonation, incorrect stress placement, unnatural rhythm, and inappropriate pausing. These errors significantly affect speech intelligibility, fluency, and overall communication effectiveness.

One of the most prominent issues is flat and monotonous intonation, which makes the speech sound robotic and unnatural. English relies on rising and falling pitch patterns to convey emphasis

and sentence meaning, but the participant failed to apply these variations. As a result, listeners struggle to grasp the intended emotions and focus points of the speech, reducing engagement and comprehension. This issue is likely influenced by the Hanzhonghua accent, which generally exhibits less pitch modulation compared to English.

Another major issue is incorrect stress placement, where the participant pronounced all syllables with equal emphasis, rather than distinguishing between stressed and unstressed syllables. Since English is a stress-timed language, this lack of differentiation weakens the natural rhythm of speech and makes it harder for listeners to identify key words. This issue aligns with findings from previous research on Chinese learners'difficulties with stress timing, particularly among speakers of syllable-timed dialects like Hanzhonghua.

Additionally, the participant's rhythm was inconsistent with English's natural stress patterns. Instead of following a stress-timed rhythm, where stressed syllables are longer and unstressed syllables are reduced, the participant pronounced each syllable with roughly equal duration. This issue contributes to a mechanical, unnatural speech flow, making it difficult for listeners to process the spoken information smoothly.

Finally, inappropriate pausing further disrupts fluency and intelligibility. The participant frequently inserted hesitations in unnatural positions, such as after conjunctions or before key verbs, breaking the natural flow of sentences. These misplaced pauses create confusion for listeners, as they interfere with the logical structure of speech. Research suggests that such pausing patterns may stem from differences in phrasing between Chinese dialects and English, leading to unnatural breaks in speech delivery.

Overall, these suprasegmental errors compound the participant's pronunciation difficulties, making their speech less comprehensible, less engaging, and more difficult to follow. Listeners must exert greater cognitive effort to process the speech, which can lead to misinterpretations or reduced communication efficiency. Without proper stress, rhythm, and intonation, even correctly pronounced words may fail to convey the intended meaning effectively. Addressing these issues through targeted intonation training, stress differentiation drills, and rhythm exercises will be essential in improving the participant's overall English pronunciation and communicative clarity.

5. Discussion

This section interprets the findings from the results, comparing them with previous research and discussing their implications. The discussion is organized into three main areas: the influence of segmental errors, the impact and explanations of suprasegmental features, and the overall effects of the Hanzhonghua accent on English pronunciation and communication.

5.1. Influence of Segmental Errors on Intelligibility

The phonetic analysis revealed systematic vowel and consonant substitutions, many of which align with the predicted negative transfer effects of Hanzhonghua.

5.1.1. Vowel Substitution and Reduction in Distinctiveness

The most frequent vowel errors included [æ] → [ɪ], [ʌ] → [ɑː], and diphthong simplifications (e.g., /əʊ/ → /uː/). These substitutions are significant because they:

(1) Reduce vowel contrast: English distinguishes between front, central, and back vowels, while Hanzhonghua simplifies some of these distinctions.

(2) Affect word recognition: Mispronunciations like salley (/ˈsæli/) → /ˈsɪli/ and love (/lʌv/) → /lɑːv/ make words harder for listeners to recognize.

These errors align with previous studies on Chinese learners' vowel difficulties (Hao, 2020), where learners struggle with English's larger vowel inventory. Deterding (2006) also noted that many Chinese speakers simplify diphthongs, leading to reduced intelligibility.

5.1.2. Consonant Substitution and Loss of Phonemic Contrast

The most problematic consonant errors were [ð] → [d], [w] → [v], and final consonant deletion.

(1) [ð] → [d] and [θ] → [s]: These substitutions align with findings by Wu & Yang (2014), who noted that many Southwestern Mandarin speakers lack dental fricatives in their phonetic inventory.

(2) Final consonant deletion: The omission of /t/ and /d/ weakens English syllable structure, making sentences harder to process.

These consonant shifts greatly impact listener comprehension, as English relies on consonant contrasts to distinguish meaning. Similar patterns have been found in studies on Cantonese speakers (Chan & Li, 2000), reinforcing the role of L1 phonology in pronunciation difficulties.

5.2. Explanation of segmental errors in the PAM-L2 framework

To further explain the cognitive mechanisms underlying the negative transfer from Hanzhonghua to English pronunciation, this study adopts the Perceptual Assimilation Model for L2 Learners (PAM-L2) proposed by Best and Tyler (2007). PAM-L2 provides a perceptual account of second language phonological acquisition, suggesting that learners' ability to accurately perceive and produce L2 sounds is largely shaped by how those sounds are categorized in relation to their existing L1 phonological system.

According to PAM-L2, when learners encounter a non-native phoneme, they tend to assimilate it to the closest L1 phoneme. If two L2 sounds are both assimilated to a single L1 category, discrimination between them becomes especially difficult, often resulting in persistent production errors. For instance, the substitution of /æ/ with /ɪ/ observed in the current study is a typical case of Single Category Assimilation. The vowel /æ/ does not exist in Mandarin or Hanzhonghua. Learners, therefore, tend to perceive it as acoustically close to [ɪ] or [ɑː], both of which are present in their L1 inventory. As a result, they misproduce salley /ˈsæli/ as [ˈsɪli], since the perceptual system fails to register /æ/ as a distinct phonemic category.

In contrast, sounds like /ʌ/ are also likely assimilated to a broad, back vowel category, such as [ɑː], leading to errors like love /lʌv/ → [lɑːv]. These perceptual overlaps create cognitive conflicts between the L2 input and the learner's L1 phonological map, resulting in predictable and persistent pronunciation issues.

5.3. Impact of Suprasegmental Features on Communication

5.3.1. Monotonous Intonation and Reduced Expressiveness

The participant's flat pitch pattern suggests a lack of natural English intonation, making speech sound robotic. According to Levis (1999), effective communication depends not only on phoneme accuracy but also on intonation cues that signal emphasis, emotion, and sentence type.

(1) English uses intonation to distinguish statements from questions, express emotions, and highlight important words. The participant's failure to vary pitch led to unnatural speech delivery, making it harder for listeners to interpret meaning beyond individual words.

(2) Listener feedback supports this finding, as two participants reported that they initially did not recognize the passage as English.

5.3.2. Lack of Stress-Timed Rhythm

English is a stress-timed language, meaning that stressed syllables occur at roughly equal intervals. In contrast, Hanzhonghua follows a more syllable-timed pattern, where each syllable receives roughly equal emphasis.

(1) The participant did not differentiate between stressed and unstressed syllables, leading to an unnatural rhythm.

(2) This pattern aligns with findings from Duanmu (2007), who noted that many Mandarin speakers struggle with English stress timing.

As a result, even when individual words were pronounced correctly, the unnatural rhythm made the passage difficult to follow.

5.3.3. Slow and Hesitant Speech

The participant's pauses in unnatural places suggest a lack of confidence in pronunciation. This aligns with research on foreign language anxiety (Horwitz et al., 1986), where pronunciation difficulties contribute to speaking hesitation.

5.4. Overall Effects of the Hanzhonghua Accent on English Communication

Based on both quantitative (listener perception) and qualitative (phonetic analysis) data, it is clear that the Hanzhonghua accent significantly impacts English intelligibility and communication. The primary challenges include:

(1) Reduced intelligibility due to vowel and consonant substitutions.

(2) Difficulty in understanding due to a lack of natural stress and rhythm.

(3) Listeners struggling to recognize sentences due to flat intonation.

However, while pronunciation affects communication, it is not the sole determinant of English proficiency. Grammar, vocabulary, and fluency also contribute to effective communication. That being said, pronunciation training can greatly enhance spoken clarity, making it easier for listeners to process speech.

6. Countermeasures and Training Strategies

Based on the identified pronunciation issues, this section proposes targeted phonetic training strategies to help Hanzhonghua speakers improve their English pronunciation. The strategies focus on correcting segmental errors (vowel and consonant mispronunciations) and enhancing suprasegmental features (intonation, rhythm, and stress patterns).

6.1. Segmental Training (Vowel and Consonant Correction)

6.1.1. Vowel Training

To correct vowel errors such as [æ] → [ɪ] and [ʌ] → [ɑː], the following training methods are recommended:

(1) Minimal Pair Drills

Learners practice distinguishing words that differ only in problematic vowels (e.g., bed vs. bad, love vs. lava).

Example exercise:

- Instructor: “I will say a word, and you repeat it.”
- Instructor: “Bed.”
- Learner: “Bed.”
- Instructor: “Bad.”
- Learner: “Bad.”

(2) Phonetic Awareness Training

- Using IPA charts and visual vowel diagrams to illustrate tongue position and mouth shape.
- Learners observe their mouth movements in a mirror while pronouncing target vowels.

(3) Listening and Shadowing

- Students listen to native English speech recordings and repeat sentences immediately after hearing them (shadowing).
- Focus on words containing target vowels (e.g., The cat sat on the mat).

6.1.2. Consonant Training

To correct [ð] → [d], [w] → [v], and final consonant deletion, the following techniques are suggested:

(1) Consonant Placement Practice

- Learners place a tongue depressor between their teeth to help produce /ð/ instead of /d/.
- Example: Practicing words like the, this, that with slow, exaggerated pronunciation.

(2) Word Final Consonant Drills

- Learners practice holding final consonants by extending the sound duration (e.g., "fieldddd," "standddd").
- Sentences with final consonants are repeated for reinforcement (e.g., I stood in the cold field).

(3) Interactive Games

- "Consonant Challenge": Students listen to words with /ð/ and /d/ and must determine which is correct.

6.2. Suprasegmental Training (Intonation, Rhythm, and Stress)

6.2.1. Intonation Practice

(1) Pitch Contour Exercises

- Learners use intonation diagrams to visualize rising and falling pitch patterns.
- Example: Comparing flat vs. natural intonation in sentences:
- Flat: "She passed the salley gardens with little snow-white feet."
- Natural: "She passed the salley gardens with little snow-white feet?"

(2) Echo Training

- Learners repeat native speech recordings with correct intonation patterns.
- Focus on sentences with questions, statements, and emotional expressions.

6.2.2. Stress and Rhythm Training

(1) Clapping Exercises

- Learners clap on stressed syllables while reading aloud.
- Example: TA-ble, a-BOUT, be-LIEVE.

(2) Poetry and Rhyming Activities

- Learners read poems with clear rhythmic patterns, such as the study passage (Down by the salley gardens).
- Encourages natural stress-timed speech.

6.2.3 Slow-to-Fast Reading

- Learners read slowly at first, exaggerating stress and intonation, then gradually increase speed while maintaining clarity.

6.3. Practical Applications and Implementation Plan

6.3.1. Study Plan Overview

Table 5. A 4-week structured training program

Week	Focus	Training Activities
Week 1	Vowel Pronunciation	Minimal pairs, vowel charts, listening exercises
Week 2	Consonant Pronunciation	/ð/ training, final consonant drills, tongue placement exercises
Week 3	Intonation and Rhythm	Pitch contour exercises, poetry reading, stress drills
Week 4	Integration and Fluency	Slow-to-fast reading, spontaneous conversation practice

- Each session should include recordings for self-evaluation, allowing learners to track their progress.
- Teachers should provide real-time corrective feedback and encourage self-monitoring techniques (e.g., recording and listening to one's own speech).

6.3.2. Long-Term Strategies

Beyond short-term training, long-term improvement can be achieved through:

(1) Daily exposure to native speech via audiobooks, podcasts, and movies.

(2) Regular pronunciation practice using speech recognition software (e.g., "Thinkthinker, an English learning software with pronunciation correction, natural spelling and other functions" "BoldVoice, a speech and accent coaching app designed for non-native English learners").

(3) Speaking clubs and peer interactions to enhance fluency and confidence.

6.4. Evaluation of Training Effectiveness

While the proposed pronunciation training strategies are grounded in established phonetic pedagogy, their practical value depends on how effectively improvements can be tracked over time. To ensure that training outcomes are measurable, consistent, and applicable, this study recommends the incorporation of clear, structured evaluation methods. These methods will enable educators and learners to monitor progress and adjust instruction based on observable results.

Firstly, pre-training and post-training pronunciation recordings should be implemented. Learners can read the same phonetic passage (e.g., the selected poem) before and after training. These recordings can be analyzed through phonetic transcription and acoustic comparison, focusing on key features such as vowel accuracy, consonant articulation, intonation range, and rhythmic timing (Celce-Murcia et al., 2010). Improvements can be quantified using error counts,

intelligibility ratings, or phoneme-level accuracy percentages.

Secondly, listener-based perception tests, similar to those used in this study, can be administered both before and after the training period. A panel of trained and untrained listeners rates the recordings based on comprehensibility, accent strength, and overall fluency using a standardized rubric or Likert scale. This method is widely used in pronunciation studies to capture perceived improvements in intelligibility (Munro & Derwing, 1995). Significant increases in listener comprehension and reductions in perceived accent interference would indicate training success.

Third, educators can integrate acoustic analysis software, such as Praat, to measure objective acoustic features—including pitch range, syllable duration, vowel formants, and pause placement (Boersma & Weenink, 2023). For instance, an increased range of intonation or a more appropriate stress-timed rhythm can signal suprasegmental improvement (Levis, 2005).

Finally, learners should complete self-monitoring checklists and reflection logs throughout the training period. Encouraging learners to set individual pronunciation goals and track their progress fosters learner autonomy and metacognitive awareness (Wenden, 1998). Teachers can provide guided reflection prompts such as: “Which sounds did you struggle with today?” or “What feedback did you receive on your intonation?”

In summary, combining pre/post recordings, perception ratings, acoustic analysis, and learner reflection offers a reliable and comprehensive framework for evaluating pronunciation training outcomes. Embedding such tools into instruction provides both instructors and learners with tangible evidence of improvement, supporting more focused and effective pronunciation teaching.

7. Conclusion

7.1. Summary of Findings

This study explored the negative transfer effects of the Hanzhonghua accent on English pronunciation, analyzing both segmental (vowel/consonant) and suprasegmental (intonation, rhythm) issues.

Key findings include:

(1) Vowel errors: Mispronunciations such as [æ] → [ɪ] and [ʌ] → [ɑː] reduce intelligibility.

(2) Consonant substitutions: [ð] → [d], [w] → [v], and final consonant deletion weaken speech clarity.

(3) Suprasegmental issues: Flat intonation and unnatural rhythm disrupt fluent communication.

(4) Perception test results: Listeners understood only 43.57% of the passage, highlighting the impact of accent interference on comprehensibility.

7.2. Implications for English Language Teaching

The findings emphasize the need for dialect-sensitive pronunciation training in English language education. Teachers should:

(1) Incorporate phonetic drills tailored to common regional pronunciation errors.

(2) Use stress and intonation exercises to improve natural speech flow.

(3) Encourage interactive speaking activities for real-world practice.

7.3. Limitations and Future Research

The study offers valuable insights but has limitations. The sample size was small, with only one participant analyzed, so future research should include more speakers for better generalizability. The perception tests had subjective elements, as listener judgments may vary, suggesting that objective speech recognition tools could improve reliability. Additionally, there was a lack of long-term intervention assessment, so further research should evaluate the effectiveness of pronunciation training over time.

Future studies could also explore several other areas. The impact of Hanzhonghua accent training on speaking confidence could be investigated. The role of phonetic technology, such as AI speech recognition, in improving pronunciation could be examined. Furthermore, comparisons with other Chinese dialects could help develop broader pronunciation teaching frameworks.

7.4. Conclusion

This study confirms that the Hanzhonghua accent poses significant challenges for English learners, affecting intelligibility and communication. However, with targeted pronunciation training, learners can improve their accuracy and fluency.

By integrating segmental correction techniques, suprasegmental training, and long-term pronunciation strategies, English educators can help dialect speakers develop clearer, more natural pronunciation, ultimately enhancing their communication skills in global contexts.

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