

Language Teaching Optimization: Enhancing the Distinction Between /i:/ and /ɪ/ for Second Language Learners

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Abstract: One of the biggest challenges encountered by second language learners is to accurately differentiate between the two vowels in English: /i:/ and /ɪ/, which play an important role in everyday communication and are crucial for clear transmission of information and effective communication due to their high functional load (FL). Therefore, the paper aims to gain a more profound understanding of the difficulties learners encounter in distinguishing these vowels, with the hope of providing them with more effective learning strategies and methods. In this paper, seven English majors and seven non-English majors were selected as the study participants using an empirical research method, and audio data on the participants' pronunciation of words containing /i:/ and /ɪ/ were collected using a recording device and analyzed using Praat. The results indicate that both groups frequently lacked an understanding of the distinctive pronunciation characteristics of these vowels, which resulted in instances of pronunciation confusion or inaccuracy. Moreover, it proposes suggestions for enhancing teaching strategies: the integration of audio and visual teaching resources and the implementation of targeted pronunciation exercises can facilitate the acquisition of English pronunciation, thereby enhancing the accuracy and fluency of their spoken English and their performance in English communication.

Keywords: Vowel Sounds, Second Language Learning, Functional Load, Second Language Teaching

1. Introduction

The accurate distinction between the long vowel /i:/ and the short vowel /ɪ/ is crucial for the accuracy and intelligibility of English pronunciation. Nevertheless, numerous second language (L2) learners encounter difficulties in articulating these sounds. The paper integrates the concept of FL into L2 instruction by focusing on the challenges learners face in distinguishing the English vowels /i:/ and /ɪ/. To gain insight into the differences in pronouncing /i:/ and /ɪ/ among L2 learners, seven English majors and seven non-English majors are selected as the research samples in this paper. The audio data of these students are collected through a recording device when they read aloud words containing the target vowels, and the audio is analyzed using Praat to compare the parameters of articulatory duration and place of articulation. Based on the analysis of FL, this paper finds that English majors and non-English majors exhibit different difficulties and misperceptions in the pronunciation of /i:/ and /ɪ/, reflecting uneven distribution of FL in their phonological systems and providing teachers with

targeted teaching suggestions. The results show that optimized strategies are essential for L2 learners to boost their pronunciation of /i:/ and /ɪ/, including enhancing pronunciation training, introducing contrastive exercises, and utilizing visual aids. The combination of FL theory and L2 pronunciation teaching provides English teachers with targeted teaching suggestions, which can help to improve the quality of English pronunciation teaching, and also promote learners' communicative competence in English.

2. Literature Review

2.1. The Concept of Functional Load

The FL principle emerged as a linguistic concept proposed by the Prague School [1], which, in a broad sense, holds the view that the greater the number of minimal pairs a phoneme produces in a language, the more important the phoneme comparison for comprehensibility [2-6]. The FL principle posits that the phonemic contrast between /i:/ and /ɪ/ distinguishes a significant number of lexical pairs in English, such as the distinction between “sleep” and “slip.” Therefore, the phonemic contrast between /i:/ and /ɪ/ is more significant than the phoneme distinction between /ʊ/ and /u:/. It does not distinguish many vocabulary words in English, such as “look” and “Luke.” The pair of /i:/ and /ɪ/ exhibits a higher FL, whereas the pair of /u:/ and /ʊ/ has a lower FL. Catford ranked many phoneme comparisons based on the FL of three syllable positions in English, including the syllable beginning, syllable ending, and syllable nucleus. And the rankings indicate that the contrast between the starting position of a syllable and the highest FL phoneme is /k/ and /h/ contrast, and the FL ranking is 100% [3]. The comparison between the ending position of a syllable and the highest FL phoneme is /d/ and /z/ contrast, with an FL ranking at 100%. The comparison between the core position of a syllable and the highest FL phoneme is /ɪ/ and /æ/ contrast, with an FL ranking of 100%. The ranking of other phoneme comparisons is below 100%, which is consistent with to the relative frequency of phoneme comparisons in the English vocabulary.

2.2. Prioritization of Pronunciation Instruction

Firstly, in terms of macro teaching planning, teachers need to be familiar with the phonetic system of English, including vowels, consonants, and their combinations [7]. And it is also essential to comprehend the distinctive characteristics of the language and to recognize similarities and differences between it and the learner's native tongue.

Secondly, teachers need to evaluate the FL of each phoneme, which can be quantified through the following aspects. One factor is discrimination, i.e. whether the phoneme is used to distinguish between different words or grammatical forms. Another factor is the frequency with which the phoneme occurs in English; the higher the frequency, the stronger the discrimination. Thirdly, the order of teaching priorities is determined based on the assessment of phonemic functional load. Phonemes with higher functional load should be given priority teaching as they are crucial for learners to understand and use English [7].

Due to biological and physiological differences, it is impossible for all students to accurately master the correct pronunciation of each syllable [7]. Consequently, teachers are supposed to implement targeted pedagogical strategies for the most crucial phonemes, such as pronunciation exercises, comparative exercises, imitation exercises, etc. These activities should aim to help learners master the correct pronunciation methods and be able to apply them in practical communication. During the teaching process, teachers should closely monitor the pronunciation of learners and provide timely feedback and correction. For phonemes with high functional load, teachers should provide more attention and guidance to ensure that learners can accurately grasp them [7].

3. Methodology

3.1. Participants and Experimental Stimuli

In this paper, seven English majors who excelled in TEM-4 and seven non-English majors who did not pass CET-4, all in their third year of undergraduate study, were selected (median age 20.32). The non-English majors are from different faculties and departments, including Education, Finance, International Politics, and Nursing, who have all received at least six years of systematic English instruction, but none of them passed the CET-4 exam in their three years of college, which was a significant difference in English proficiency from that of the English majors.

As for the experimental stimuli, six pairs of words that constitute the minimal pairs, differing only in the phoneme pairs /i:/ and /ɪ/, were selected. The first group of words contains six words with /ɪ/, which are ship, slip, sit, fill, hill, and mill. The second group contains six words with /i:/, which are sheep, sleep, seat, feel, heel, and meal. The corpus data indicates that these 12 words are used quite frequently and therefore have great significance in daily language communication.

3.2. Experimental Process

The experimental process can be divided into several stages. Prior to the commencement of the experiment, participants were interviewed in order to ascertain their previous experience of learning English and their current level of proficiency in the language. Once it was established that the participants were suitable for inclusion in the experiment, they were required to record two audio files on the same device, each containing the two sets of words previously mentioned. Each word was read only once. In order to ensure the confidentiality of the participants' personally identifiable information, the audio files were labelled only with their respective English or non-English majors. Upon completion of the recordings, each audio file was then imported into the Praat software in order to collect and organize the values of F1 and F2. F1 is indicative of the height of the vowel, while F2 is indicative of the front-to-back position of the vowel. By measuring and analyzing these values, it was possible to gain insight into the participants' pronunciation habits and accuracy, which in turn enabled the provision of feedback and guidance tailored to their individual needs. Finally, relevant figures were generated to facilitate more precise judgments.

4. Results

The results can be analyzed in terms of commonalities and differences. As far as commonality is concerned, it can be seen from Figure 1 that both English majors and non-English majors are able to differentiate the vowels /i:/ and /ɪ/ to a certain extent when they pronounce them. There are some notable differences in the pronunciation trends between the two groups of students. In particular, the F2 value for the vowel /i:/ was typically higher than that for /ɪ/. Nevertheless, both groups of students encountered difficulties in completely avoiding confusion between the two vowels in actual use. A similar tendency was observed in the pronunciation of /ɪ/ as /i:/. Both groups of students demonstrated a proclivity to pronounce /ɪ/ as /i:/ when speaking.

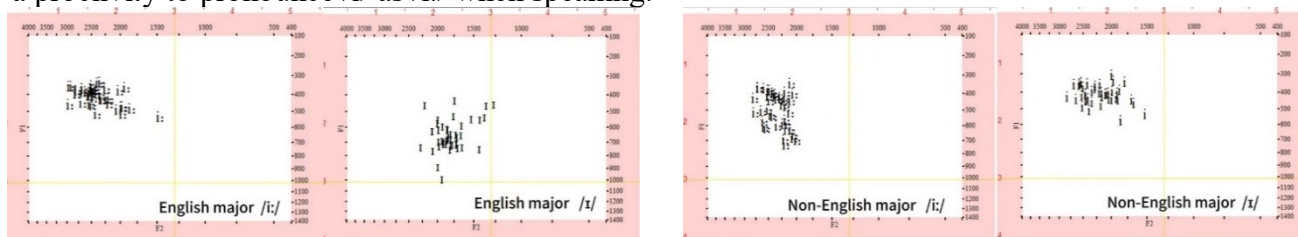


Figure 1: Mapping of Vowel Ellipses from Resonance Peak Data (Script Source: Ling Feng).

4.1. Differences

One of the key differences that can be identified is the issue of discrimination. English majors are better at differentiating between the vowels /i:/ and /ɪ/ when pronouncing them, probably due to the fact that they have received systematic training in phonetics and are able to comprehend the pronunciation characteristics and distinctions between these two vowels in depth, which enables them to perceive the differences between the vowels with greater accuracy when they speak. The chart also demonstrates the English majors' proficiency in vowel height. English majors exhibit a significantly greater ability to comprehend the nuances of vowel height than their non-English major counterparts. It is possible that they pay greater attention to the changes in vowel height, which enables them to represent the differences in vowel height more accurately when they speak.

5. Discussion

To address the commonalities and differences between English majors and non-English majors in the pronunciation of /i:/ and /ɪ/, a series of teaching strategies can be adopted to optimize the effectiveness of teaching. The first and foremost is to recognize the common challenge faced by both groups, which is that these two vowels are easily confused in practical use.

5.1. Common Solutions

It is important to strengthen vowel contrast training. Specialized pronunciation exercises should be designed to emphasize the difference between /i:/ and /ɪ/. For example, exercises on minimal pairs of sounds such as “sleep” and “slip” help students perceive and differentiate these two sounds. Applying visual aids in the teaching process can improve the quality of learning. Teachers can use charts or animations to demonstrate the pronunciation positions of these two vowels in the oral cavity so that students can have a more intuitive understanding. Teachers should also include contextual exercises in the teaching process. Practicing pronunciation in the context of sentences and dialogues can make students pronounce the sounds more accurately in practical applications.

5.2. Differentiated Solutions

For English majors, the teaching of phonological theory can be strengthened to understand the pronunciation mechanism of vowels so as to master the pronunciation skills more accurately. Pay more attention to imitation and self-correction, listen more and more to imitate the standard pronunciation, and self-correct the pronunciation errors through recordings. For non-English majors, stimulating interest is the first step [7], and interest in pronunciation learning is mobilized by introducing interesting pronunciation games or activities. According to the actual level, pronunciation teaching is carried out in stages to ensure that each student can improve from his/her own foundation. Based on the above solutions, a pronunciation teaching program can be designed that will use a variety of teaching methods, such as combining listening and speaking, combining theory and practice, combining individual instruction and group discussion, etc., to ensure that every student can benefit from it. In addition, modern teaching technologies such as multimedia will be fully utilized to provide students with richer and more convenient learning resources.

6. Teaching Optimization

6.1. Specific Lesson Plan

It is essential that teaching objectives be set in order to enable students to accurately distinguish the differences in pronunciation between the long vowel /i:/ and the short vowel /ɪ/. Furthermore, it is

crucial that students be able to correctly pronounce words and phrases containing /i:/ and /ɪ/, as well as to accurately use these two vowels in communication. In order to facilitate the learning process, it is recommended that teaching aids include audio-visual materials containing examples of /i:/ and /ɪ/ pronunciation, word cards for pronunciation practice, recording devices (e.g., cell phones), chalkboards or whiteboards, and writing instruments [8].

6.2. Teaching Process

The preceding analysis has led to the design of the teaching process, as shown in Table 1. Through the process of teaching reflection, the instructor is able to analyze the students' performance in pronunciation practice, identify any common problems or special needs that may arise, and consider ways to further optimize the lesson plan in order to enhance the effectiveness and quality of pronunciation instruction.

Table 1: Teaching Process Design

Steps	Contents
Introduction to the Course (5 minutes)	Greet students and introduce the topic of the lesson: Distinguishing Vowel Pronunciation of /i:/ and /ɪ/, and briefly explain the pronunciation characteristics of /i:/ and /ɪ/.
Audio-Visual Presentation and Pronunciation Demonstration (10 minutes)	Play audio-visual materials containing examples of /i:/ and /ɪ/ pronunciation to give students an initial sense of the pronunciation difference between the two vowels, ask students about what they have observed from the video, and ask them to repeat the demonstration pronunciation.
Pronunciation Practice (15 minutes)	Distribute pronunciation practice word cards for words and phrases containing /i:/ and /ɪ/, allow students to practice pronunciation in groups to correct each other's pronunciation errors, and ask a few students to come to the front to show their pronunciation, with feedback from other students and the teacher.
Audio-Visual Assisted Practice (10 minutes)	Play audio-visual materials containing /i:/ and /ɪ/ pronunciation for students to imitate and repeat the exercises, and encourage students to record their own pronunciation practice and compare it with the audio-visual materials to identify differences for improvement.
Summary and Feedback (5 minutes)	Summarize and emphasize the differences of /i:/ and /ɪ/, ask students about their takeaways and feelings about the lesson, encourage them to raise questions and make suggestions, and assign homework, i.e., record a short text or dialogue containing /i:/ and /ɪ/ pronunciation and upload it to the class learning platform.

6.3. Importance of the Audio Materials and Video Materials

The utilization of audio and video materials helps better apply the PPP model into teaching, which is also known as the “Three-in-One Method,” which divides language teaching into three stages: presentation, practice, and production [9]. Firstly, it provides clear visualization at the presentation stage. Audio-visual materials can clearly and visually present the pronunciation process of /i:/ and /ɪ/, including mouth shape, tongue position, and sound characteristics, which helps students perceive the differences between the two vowels more accurately and grasp the pronunciation techniques. Second, students can imitate in the practicing stage. The audio-visual materials can be used as pronunciation demonstrations for students to imitate the pronunciation shown, which helps to form correct

pronunciation habits and improve the accuracy of pronunciation. Third, repeated practice is supported: the materials can be played repeatedly and students can practice as needed, so that they can consolidate what they have learned to improve the proficiency and accuracy of pronunciation. Finally, interaction can be boosted. These materials allow teachers to model pronunciation using audiovisual materials, and students can follow along, mimic and record, thus enhancing classroom interaction. In addition, students can also share their recordings and provide feedback to each other, fostering engagement and excitement in the learning process.

6.4. Importance of In-Class and After-Class Exercises

In-class exercises facilitate the immediate application of theoretical knowledge about the vowels /i:/ and /ɪ/. Through the use of pronunciation and listening exercises, students are able to perceive the differences between these two vowels with greater ease, thereby enhancing their comprehension and retention. To develop their self-learning abilities, students are required to complete after-class exercises on their own. The problem-solving process, in which they must think independently, consult materials, and summarize their findings, is essential for their future learning. Any errors or difficult situations that occur during the exercises give students the opportunity to reflect and adjust their learning strategies in time to improve their ability to master the pronunciation of these two vowels. Additionally, the difficulties encountered by students in completing their homework can be utilized by educators as a means of identifying areas in which students may require further assistance. This information can then be utilized by teachers to inform the development of more effective teaching strategies and enhance the overall quality of the educational experience.

7. Conclusion

This paper recruited several English majors and non-English majors as experimental participants and collected data on their pronunciation and differentiation of two phonemes. It was found that they all had difficulties in accurately distinguishing the two phonemes and had unstable control of their mouth and tongue position when imitating the pronunciation, but in contrast, non-English majors were more likely to be affected by native pronunciation habits, leading to mispronunciation. Therefore, this paper emphasizes the importance of audio, video and practice in English teaching, indicating that students can effectively master correct pronunciation methods and techniques via clear and accurate pronunciation demonstrations and a lot of imitation practice. In addition, audio and video materials can be used to simulate real language environments to help students adapt to a fast, continuous speech environment. However, the limited number of participants may affect the generalizability of the findings. Future studies can expand the sample size to cover a wider range of student groups and language backgrounds to obtain more comprehensive and accurate findings. Furthermore, future studies could further explore the differentiation of other phonemes and teaching strategies to provide more comprehensive guidance for English language teaching.

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