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The Effect of POA-Based Pronunciation Instruction on Listening Comprehension in College English at a Medical University

Heyun Ma*

School of Foreign Languages, Ningxia Medical University, Yinchuan 750004, Ningxia, China

***Corresponding author:** Heyun Ma, Heyunm@126.com

Abstract: In medical universities, a persistent problem is that students who have passed CET-4 still fail to use or speak English effectively. The paper integrated the production-oriented approach (POA) with pronunciation instruction and assigned the cycle of motivating-enabling-assessing for a listening elective class of 38 medical students. After the intervention, the accuracy of both pronunciation and listening was improved markedly. Most students reported clearer pronunciation and connected speech in the post-course questionnaire. This shows that POA-based pronunciation instruction contributes to improving medical-university students' phonological knowledge and listening comprehension, and offers a practical reference for ESP-oriented College English reform.

Keywords: Production-oriented approach; Pronunciation instruction; Listening comprehension; College English

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1. Introduction

There is a common complaint that medical students who have satisfactory CET-4 scores have challenges in speaking English, especially when they are placed in authentic medical scenarios, such as explaining diagnoses to patients, presenting case reports, or giving presentations at international conferences. This problem is closely related to traditional teaching practices. Reading and grammar take most of the classroom time, while pronunciation practice is regarded as a subsidiary skill and listening class is often reduced to the process of finishing exercises, checking answers, and explaining errors. Consequently, the intrinsic connection between listening and speaking, and between pronunciation and listening comprehension, has not been effectively established [1].

Production-oriented approach (POA) was proposed by Wen Qiufang, it reconstructs the foreign language classrooms around the motivating-enabling-assessing cycle [2]. In this paper, students are first given a productions task, which they will find out their own deficiencies. The teacher then provides targeted input

and scaffolding, finally assessment is provided to consolidate the learning output. POA is considered a localized pedagogical paradigm for addressing the separation of learning and use in Chinese foreign language classrooms. Over the past decade, a growing number of studies on POA has emerged in the fields of writing and oral English instruction. Few studies have applied POA to medical-university contexts, and fewer still have investigated the effect of pronunciation instruction on listening comprehension within the POA framework.

To address this gap, the paper tries to answer two research questions: First, can POA-based pronunciation instruction improve medical students' phonological knowledge and production ability? Second, can improvement in pronunciation be accompanied by improvement in listening comprehension? The study was conducted in an English Listening Enhancement elective under a university-level teaching reform project.

2. Literature review

2.1. Where POA theory meets pronunciation teaching

POA follows three pedagogical principles, namely learning-using integration, cultural exchange, and key competencies. In terms of instructional design, POA adopts production tasks to stimulate students' attention and provides targeted input and scaffolding in the enabling phase [2]. Pronunciation instruction is highly compatible with this teaching model. As a skill heavily dependent on the output–feedback cycle, pronunciation requires students to engage in reading aloud, retelling, and question-and-answer activities so that teachers can identify pronunciation deviations and provide targeted correction. By comparison, mere listening and imitation exercises are insufficient in cognitive engagement and are not conducive to the cultivation of stable pronunciation habits [5]. In recent years, Wen and her colleagues have extended POA to the field of pronunciation and speaking instruction, maintaining that production tasks can activate the routinization of phonological knowledge [3].

2.2. Phonological knowledge and listening comprehension

Second-language listening comprehension involves two processing levels: bottom-up phonetic decoding and top-down schema construction [6]. Field [7] argued that listening breakdown in a second language is rarely a matter of vocabulary or grammar. The real problem lies in spoken language itself—learners often fail to recognize liaison, weak forms, assimilation, elision, and other connected-speech phenomena. This finding suggests that systematic pronunciation training, especially training oriented toward connected speech, contributes to improving the fluency of phonetic decoding and turns into facilitating listening comprehension. Domestic empirical studies have also found that task-based pronunciation training has a positive effect on university students' listening performance.

2.3. The ESP turn in College English at medical universities

College English at medical universities is shifting from general English to Medical English for Specific Purposes (ESP) [4]. However, medical English requires students' higher-level production abilities, such as retelling, question-and-answer, and presentation. These abilities cannot be effectively cultivated through a general English course with limited class hours. Embedding pronunciation as a preliminary concept in ESP curriculum is feasible. It first establishes the foundational link between phonetic decoding and oral production, then extends to medical scenario retelling and question answering. Field [7] emphasized that listening instruction should prioritize bottom-up phonetic decoding. The study focuses on the relationship between pronunciation and listening. It examines the

effect of POA-based pronunciation instruction on listening comprehension among medical-university students within a single-group pre–post design. Medical-scenario production was used only as a baseline diagnostic in the pre-test, which is a reference for subsequent in-depth research.

3. Research design

3.1. Instructional design

The participants were 38 non-English-major medical undergraduates. The majority had passed CET-4, and their English proficiency was above average for the university. The course comprised 24 class hours spread over roughly eight weeks. The key design principle was to adopt the POA structure to organize pronunciation instruction and to use pronunciation as a pivot for enhancing listening comprehension. Each instructional unit followed the three-phase process. In the motivating phase, the teacher presented listening and speaking challenges from authentic medical scenarios, such as clips from medical conference addresses or audio recordings of doctors explaining medical terms to patients. The teacher invited students to take notes or retell the content, after which students immediately found gaps in their phonetic decoding and oral production. Targeted exercises followed; the teacher organized targeted exercises on plosives, dark /l/, voicing, elision, liaison, and weak forms based on the pronunciation difficulties exposed in the motivating task. Students also practiced reading aloud and shadowing high-frequency medical terms. Assessment took three forms: in-class reading aloud and question-and-answer, peer evaluation, and after-class online self-assessment. This provides feedback on students' pronunciation production and listening decoding.

3.2. A POA unit in action: "Hand Hygiene in Clinical Settings"

The "Hand Hygiene" unit illustrates how POA worked in the classroom. The unit came from the pre-test medical-scenario item and followed the motivating–enabling–assessing cycle.

Motivating: The teacher played a WHO video (approximately 90 seconds) on the five steps for Hand Hygiene and then assigned a production task: "explain in 60 seconds why healthcare workers need to wash their hands before and after contacting each patient." Students worked in groups to produce oral responses, and the teacher recorded the production. During this process, students directly found out their deficiencies in medical terminology pronunciation, liaison and weak forms, and fluent retelling. It stimulated their intrinsic learning motivation.

Enabling: The teacher designed three types of scaffolding activities targeting the specific problems exposed by the video and the production task. At the phonological level, group practice was organized on liaison, elision, and dark /l/ in high-frequency medical phrases such as "hand hygiene," "before–after," and "patient care." For vocabulary and chunks, core terms such as "susceptible," "transmission," and "cross-contamination" were presented through flashcards, with the focus on pronunciation, stress, and meaning as an integrated whole. Sentence-level tasks involved high-frequency academic patterns such as "The reason why we… is that…" and "It is essential to… before/after…." Those were provided to help students move from input to production more smoothly.

Assessing: Assessment was practiced at both immediate and delayed levels. Immediately, the teachers selected representative students to repeat the motivating task in class, and peer-evaluated their performance based on four criteria: pronunciation clarity, connected-speech fluency, terminology accuracy, and information completeness. Three days later, all students were required to submit a 60-second audio recording

explaining hand hygiene, and the teacher and teaching assistant provided feedback based on a scoring rubric. The entire unit took approximately two class hours and completed the POA cycle of motivating (exposing gaps), enabling (targeted correction), and assessing (consolidating new habits).

3.3. Instruments

The post-test was taken on two platforms. On the Chaoxing (CX) platform, students completed five items: one listening comprehension item including four multiple-choice questions based on a CET-4-level passage, and four oral production—word reading, sentence reading with connected-speech techniques, passage reading, and listen-and-retell based on a short audio clip. On the Wenjuanxing (WJX) platform, students completed five phonological knowledge identification items (covering plosives, dark /l/, voicing, elision, and voiceless/voiced consonants), seven listening comprehension items, and a five-item self-rating scale measuring perceived improvement in pronunciation, liaison and connected speech, listening strategies, reading-aloud skills, and interest in English learning.

It should be noted that three of the four oral production items (word reading, sentence reading, and passage reading) correspond directly to the three pronunciation production items in the pre-test, which provides a parallel basis for pre–post comparison. The phonological knowledge items measure recognition rather than production and serve as a supplementary indicator.

3.4. Data analysis

The study involved descriptive statistics and pre–post comparison of accuracy rates. The CX platform provided student-level scores for the post-test oral production and listening items, which gave calculation of means and standard deviations; however, the CX pre-test exported only class-level aggregate accuracy rates without individual student data, which precluded student-level paired-samples *t*-tests. The WJX platform provided class-level aggregate accuracy for the phonological knowledge and listening items, as well as self-rating percentages. This analytical approach is consistent with the characteristics of small-sample classroom action research, and its limitations are acknowledged in the discussion section.

4. Results

4.1. Pre-test: The ability profile at entry

The pre-test results showed that, at the beginning of the course, the 38 students represented a distinctive ability profile: connected-speech ability was weak, and medical-scenario production ability was particularly weak (**Table 1**).

Table 1. Mean accuracy rates by pre-test item (n = 38)

Item	Task type	Ability assessed	Mean accuracy
Q1	Listening comprehension	CET-4 long conversation	44.60%
Q2	Reading words aloud	Accuracy of underlined sounds	48.20%
Q3	Reading sentences aloud	Sentence intonation & rhythm	69.90%
Q4	Reading a passage aloud	Overall connected speech	72.30%
Q5	Medical retelling	Hand Hygiene topic	39.80%
Q6	Medical Q&A	Teamwork in Hospitals	14.70%

As shown in **Table 1**, listening comprehension accuracy (44.60%) was substantially lower than passage

reading accuracy (72.30%), indicating that the ability to read words aloud does not equal the ability to understand connected speech, and that the listening-decoding bottleneck was evident. The accuracy of reading isolated words aloud (48.20%) was markedly lower than that of sentence and passage reading. This result suggests that students relied more on longer context to compensate for individual phonological errors, and their word-level phonological knowledge was insufficient. The accuracy of medical-scenario retelling and question-and-answer was only 39.80% and 14.70%, which is in obvious contrast to the students' CET-4 passing scores. This points to the need for College English at medical universities to undergo ESP-oriented reform.

4.2. Post-test: Phonological knowledge and listening after POA instruction

After 24 class hours of POA-based instruction, post-test data were collected from both platforms. On the WJC platform, students achieved an average accuracy of 76.32% across the five phonological knowledge identification items and 72.18% across the seven listening comprehension items. On the CX platform, the oral production items showed an average accuracy of approximately 80% across the four tasks, and the listening comprehension item showed an average accuracy of 66.88%. On the post-course self-rating scale, 97.37% of students reported obvious improvement in pronunciation and connected speech (**Table 2**).

As shown in **Tables 3** and **4**, phonological knowledge identification (76.32%) and oral production accuracy (mean 79.89%) were at comparable levels. Elision remained the weakest knowledge item (55.26%), and sentence and passage reading scored slightly lower than word reading and listen-and-retell, indicating that connected-speech production at the sentence and discourse level was more challenging than isolated word pronunciation. The listen-and-retell item reached 80.71%, suggesting that students were able to transfer improved decoding skills to integrated listening–speaking tasks.

Table 2. Post-test self-rated improvement (WJX, *n* = 38)

Self-rating dimension	Reporting improvement
Pronunciation	97.37%
Liaison and connected speech	97.37%
Listening strategies	81.58%
Reading-aloud skills	89.47%
Interest in English learning	81.58%

Table 3. Post-test accuracy on phonological knowledge items (*n* = 38)

Knowledge point	Example word	Accuracy
Plosives /f/–/v/	of / off	92.11%
Dark /l/	bell	81.58%
Voicing (of /s/ after voiceless stops)	str in strike	71.05%
Elision	/d/ in good night	55.26%
Voiceless/voiced consonants	s pronounced /z/ in eyes	81.58%
Mean of 5 items	—	76.32%

Table 4. Post-test scores on oral production items (CX, *n* = 38)

Item	Task type	Mean score	Accuracy	SD
Q1	Word reading (underlined sounds)	16.29	81.43%	2.37
Q2	Sentence reading with liaison/elision	15.82	79.12%	1.57
Q3	Passage reading	15.83	79.13%	1.38
Q4	Listen-and-retell (short audio clip)	16.14	80.71%	1.20
Mean	—	16.02	80.10%	—

4.3. Pre-post comparison: Parallel gains in pronunciation and listening

As shown in **Table 5**, the largest gain occurred in word reading (+33.23 pp), where the pre-test baseline had been the lowest (48.20%), indicating that targeted production–correction cycles were particularly effective at the word level. Sentence reading and passage reading, which already had higher pre-test baselines, showed more moderate gains of 9.22 and 6.83 pp. The mean accuracy across the three items rose from 63.47% to 79.89%, showing an increase of 16.43 percentage points.

Table 5. Pre-post comparison of parallel pronunciation production items (CX, *n* = 38)

Task	Pre-test	Post-test	Change
Word reading (underlined sounds)	48.20%	81.43%	+33.23 pp
Sentence reading (rhythm/connected speech)	69.90%	79.12%	+9.22 pp
Passage reading (overall connected speech)	72.30%	79.13%	+6.83 pp
Mean of three items	63.47%	79.89%	+16.43 pp

Listening comprehension rose from 44.60% on the pre-test to 66.88% on the Chaoxing post-test. The pre- and post-test items differed in number and format but targeted connected-speech comprehension at a comparable level. The self-rating data pointed in the same direction. Overall, pronunciation and listening both improved over the course of the POA intervention

5. Discussion

5.1. Why could pronunciation-to-listening transfer be observed within 24 hours?

Field [7] distinguished different levels of listening processing and pointed out that inadequate phonetic decoding is a common cause of listening comprehension failure. The POA course allocated most classroom time to production–correction cycles involving plosives, liaison, weak forms, and other connected-speech phenomena directly relevant to phonetic decoding; pronunciation production accuracy rose from 63.47% to 79.89%, and listening comprehension improved from 44.60% to 66.88%, with over 80% of students reporting improved listening strategies, a direction consistent with Field's account. Without a control group or individual-level pre-test data, the paper can only conclude that pronunciation training and listening performance moved in the same direction over the same period rather than establishing a causal link between them. These observations remain descriptive, as is typical of classroom action research, and the pronunciation–listening link needs controlled studies to confirm.

5.2. How the POA framework operates in pronunciation teaching

Traditional pronunciation classes usually move from listening and imitation to phonetic-symbol explanation and then read-aloud practice. Students spend most of the class receiving input rather than producing language. POA instead puts pronunciation instruction in the production-driven motivating–enabling–assessing cycle. The motivating phase does not begin with knowledge transmission. It places students in authentic medical-scenario tasks and allows them to produce first, which reveals pronunciation weaknesses and stimulates intrinsic motivation.

The enabling phase provides targeted input and practice based on the specific deviations, instead of delivering broad lectures. The assessing phase provides timely feedback following production, which helps students solidify the pronunciation habits they have just practiced. Under this design, pronunciation moves from a peripheral skill to the starting point that drives each unit. On the post-course questionnaire, 97.37% of students reported improvement in pronunciation and liaison, which means that the approach was well received.

5.3. Value for the medical ESP transition

The low pre-test scores on Q5 (medical retelling, 39.80%) and Q6 (medical question-and-answer, 14.70%) show that even students who have passed CET-4 may have limited ability in advanced medical English production. This study prioritized general-level pronunciation decoding and production rather than introducing medical scenarios from the outset. Future work can move from pronunciation into medical retelling, Q&A, and case presentation—the skills that distinguish medical-university English from general English.

5.4. Limitations

The Chaoxing pre-test exported only class-level aggregate accuracy without individual student data, which affected paired-samples *t*-tests and effect size calculations. Maturation and test-familiarity effects offer alternative explanations for the observed gains, which therefore cannot be attributed solely to the intervention. The sample was drawn from a single elective at one institution, limiting external validity. Controlled designs, individual-level pre-test data, and human-rated assessments with AI scoring would lead to a stronger test of the pronunciation–listening link.

6. Conclusion and implications

This study used a 24-hour English Listening Enhancement elective for medical majors to test the POA framework in integrated pronunciation–listening instruction. The main findings are as follows.

POA-based pronunciation instruction was associated with clear gains across oral production, listening comprehension, and phonological knowledge. Word-level gains were the largest, and listening comprehension improved on both post-test platforms. Students responded positively to the production-driven approach, with nearly all reporting noticeable improvement in pronunciation and connected speech. Above all, the findings suggest that a pronunciation-centered POA intervention offers a practical starting point for moving College English at medical universities toward ESP.

Short courses should concentrate on pronunciation as a foundational bottleneck rather than spreading effort across all oral dimensions. Diagnostic assessment of higher-order medical English production belongs at the front end. The POA motivating–enabling–assessing cycle offers a workable mechanism for moving pronunciation from a subsidiary skill to a production anchor, though its effectiveness needs testing across

more institutions and course types.

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