



Self-assessment and High Variability Phonetic Training: A Reflection on Using Them Together to Support Phonetic Learning in the ESL Classroom

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Abstract

Previous research on second language (L2) error perception has suggested that a better ability to perceive L2 errors may lead to better production of L2 sounds. A follow-up classroom study has shown the potential benefits of using self-assessment (S-A), one type of formative assessment, to raise learner awareness of their progress in a classroom context. These promising results raise important questions for L2 pronunciation teachers when incorporating S-A into their instruction. Where does S-A fit in L2 pronunciation instructional frameworks? How can teachers provide adequate perceptual training? High Variability Phonetic Training (HVPT), an experimental perceptual training paradigm, has revealed positive learning outcomes and great potential for L2 pedagogy, yet despite these encouraging results, researchers have observed the divide between HVPT research and its adoption by language teachers. How can language teachers use HVPT to better reinforce learner S-A? Can S-A be used to better inform HVPT-based instruction? In this practitioner's reflection paper, a review of HVPT and L2 self-assessment literature will be presented through the lens of the Speech Learning Model. Pedagogical recommendations of these complementary tools will be then discussed in an attempt to bridge the gap further between HVPT research, action research and classroom L2 pronunciation teaching.

Keywords: Self-assessment, high variability phonetic training (HVPT), L2 phonological development, (revised) Speech Learning Model, formative assessment

1. Introduction

Some form of practice in perceiving the target sounds of a second language (L2) often accompanies or precedes practice in their production, as is evidenced in L2 pronunciation manuals at different levels [1-7] and current pedagogical practice [8-13]. Wouters and John [14] have shown that the ability to detect L2 pronunciation errors correlates to better L2 production. These authors thus argued in favour of further developing perception skills with attention to learner errors. A 2024 meta-analysis of high variability phonetic training (HVPT) research-based literature [15] revealed that only some studies analyzed were able to observe moderate-to-large correlations between perception and production gains while the analysis of long-term retention and generalization were inconclusive.

Follow-up studies (to [14]) incorporating the use of self-assessment (S-A) in L2 instruction revealed greater learner awareness of their errors [16, 17]. If learners benefit from paying attention to the target sounds as well as their own errors, how can teachers provide adequate L2 perceptual training? Informed by Flege's Speech Learning Model (SLM) [18], this reflection paper aims to explore the place of perception in L2 phonetic development and how, high variability phonetic training (HVPT) [19], a promising research paradigm, can be paired with self-assessment in classroom instruction to better support learning outcomes.

2. L2 Pronunciation Instruction

2.1 Intelligibility

Even among native speakers (NSs), there may be great variety in what is considered "correct" or "incorrect" pronunciation [20], so rather than training L2 learners to aim for a native-like accent, L2 instruction should lean heavily on a top-down, holistic approach focusing on intelligibility [8, 10, 12, 13], i.e., "the extent to which a listener actually understands an utterance or message" [21, p. 385]. To address the question of L2 pronunciation priorities from this viewpoint, attention should focus on aspects of connected speech [20] and suprasegmentals [22] with L2 segments being addressed only when intelligibility is impeded [9, 22].



2.2 The Communicative Framework

Developing communicative competence [23] has long been a main objective in L2 course design [12, 13]. Unfortunately, in communicative classrooms, pronunciation is often neglected in L2 classrooms [24, 25]. For example, insufficient pre-service teacher training in pronunciation has been reported [24, 26]. Further obstacles may be 1) time constraints on teaching and assessment, 2) too much uncertainty involving methodological or instructional choices, which may lead to questions about 3) what to prioritize, especially in classes where with more than one mother tongue (L1) represented in a class [25].

Current L2 pronunciation pedagogy is guided by the five-stage communicative framework [8, p. 45] involving 1) description and analysis, 2) listening discrimination, 3) controlled practice, 4) guided practice, and 5) communicative practice. Through the **description and analysis** phase, teachers provide the theoretical bases and illustrations as to how sounds are produced and when they should occur. This may also include the ability to make predictions about L2 production, for example, anticipating sound-spelling correspondence [27]. During the **listening discrimination** phase, L2 perception lessons should provide feedback to guide the learners to listen for L1-L2 differences and identification of the L2 targets. Both in-class, teacher-driven activities and technology-assisted exercises give immediate feedback to raise learner awareness of perceptual strengths and weaknesses. **Controlled practice** is a production phase where learner focus is intentionally drawn to the L2 sounds through minimal pair practice and simplified dialogs containing the targeted sounds. At this stage, production activities further challenge student awareness of L2 sounds. **Guided practice** is intended to help students still attend to the accuracy of target production while engaging in more demanding, motivating and naturalistic open-ended activities, such as information gap activities or dialogs. **Communicative practice** entails open-ended activities that force learners to focus on content in addition to the accuracy of form. Suggested activities include role-plays, problem-solving and conversations.

2.3 Self-Assessment

Defined as “a descriptive and evaluative act carried out by the student concerning his or her work and academic abilities” [28, p. 368], S-A is increasingly used in formative assessment and has been shown to have a positive impact on learning [28, 29], such as contributing to the development of essential self-regulatory skills that foster learner autonomy [30]. Several important advantages of using S-A in the L2 classroom have been reported: accurate tracking of progress in developing L2 skills; savings in classroom time management and teacher workload, especially for large classes; more student engagement and development of autonomous learning; less anxiety when being evaluated; and sharpened reflective and critical thinking skills [31]. Indeed, S-A allow students to monitor their performance in a safe space where errors are accepted and free from others’ judgment, thus allowing them to be more engaged with the course material and better equipped at undertaking more challenging learning tasks [31].

More specific to L2 pronunciation, it has been observed that S-A raises their awareness of L2 production and helps them analyze their own production critically [32], especially for suprasegmentals [16,17]. L2 learners may have difficulty identifying their weaknesses when self-assessing [32] as well as pinpointing their pronunciation errors [33]. Learners can detect that their production may not meet “standard” expectations, yet cannot identify as many errors [34] nor the same ones [32] as NSs. These points underscore the importance of teacher guidance as students develop their S-A skills.

2.4. The Pronunciation Integration Framework

S-A plays a central role in another framework for pronunciation integration into the L2 curriculum [9, p. 71]. Stage 1 draws attention to **institutional factors**, such as program guidelines, access to computer labs and learning management systems (LMS), technological support and teacher knowledge. Stage 2 focuses on **learner factors** and draws attention to the fact that L2 pronunciation learners may not always know what their pronunciation needs are in relation to the course or the teacher’s expectations. The third stage directly involves designing careful **needs assessment** activities that raising learner awareness about the different aspects of pronunciation. In the fourth stage, teachers must then provide **information and feedback** that explicitly target learner needs. The final step aims to scaffold pronunciation skills that are needed to reinforce lifelong improvement and **build learner autonomy**.



3. Acquiring L2 Phonetic Categories: The Speech Language Model

Flege's Speech Learning Model [18] has attempted to explain the nature of accented L2 production in terms of how easy or difficult it is to perceive, or to map out, non-native (NN) sounds to native (N) phonetic categories in a "common phonetic space" [35, p. 19]. In this model, phonetic categories are understood to be the "prototypes" or "best exemplars" of a language's consonant or vowel sounds; i. e., they are "the articulatory goal[s] used by language-specific phonetic realization 'rules' in producing speech [and] are used to access segment-sized units of speech that, in turn, are used to activate word candidates during lexical access" [35, p. 12]. These articulatory goals are determined and later influenced by, among others, mental representations and perceptual cues that are weighted and stored in long-term memory [35]. The SLM model posits that L1 and L2 learning are similar in that distribution of phonetic input determines how phonetic categories are formed [35, p. 11]. The model further predicts that the success of L2 phonetic category mapping, or perceptual linking to L1 sounds, is determined by "statistical input distributions" of phonetic input, especially allophonic variation and multiple acoustic cues that may differ from one language to another depending on aspects of position-dependent coarticulation [35, pp. 13-19]. Thus, the SLM explains L1 and L2 segment acquisition as follows:

1. *L1 sounds initially "substitute" L2 sounds because the L2 sounds are automatically linked to sounds in the L1 phonetic inventory;*
2. *preexisting L1 phonetic categories interfere with, and sometimes block, the formation of new phonetic categories for L2 sounds; and*
3. *the learning of L2 sounds is based on input that differs from the input that monolingual [NSs] of the target L2 receive when learning the same sounds"* [35, p. 23].

In other words, cross-linguistic mapping of these categories is processed such that the ease or difficulty in mastering NN sounds is based on difficulties in forming new phonetic categories due to a process called "interlingual identification" [35, pp. 13, 8] (originally "equivalence classification" [36]). In other words, if the phonetic features of the L2 sound are sufficiently similar, this sound will be quite difficult to master because it will be judged to be equivalent to one or more L1 phonemes. Sounds that are not judged as sharing equivalent phonetic features are expected to be easily mastered since a "new" L2 category is formed [36].

For the language teacher, this model suggests that learners must be exposed to phonetically rich and varied L2 input; however, is there a place for perceptual training in the L2 pronunciation classroom?

4. Perceptual Training

High Variability Phonetic Training (HVPT), a common perceptual research paradigm, is « perceptual training (most often focusing on segmentals), in which the auditory training stimuli include numerous samples, produced by multiple talkers, in varied phonetic contexts » [38, p. 209] with the goal of facilitating generalization of their perceptual learning to new contexts and unknown speakers. HVPT may include discrimination and identification tasks encompassing exposure to variability in initial, medial or final position of a word; training of isolated words or words in a sentence; real L2 words or nonsense words; familiar or unfamiliar spontaneous human voices provided by several different speakers vs. synthetic voices as well as single-talker or multiple-talker input [37, 38]. A metaanalysis of HVPT studies [38] has revealed positive learning outcomes: a rate of significant improvement in both perception and production was found in all but one of these training studies (97%) of which the vast majority involved only adult learners.

Despite many research questions that have yet to be answered, HVPT seems to be the best candidate for L2 perceptual training for instructional use [38] given that other tools, such as Praat or AI (automatic speech recognition and text-to-speech), may require extensive acoustic manipulation and expertise that some teachers may not have [39]. However, HVPT still remains underexploited among teachers [37, 38].

English Accent Coach (EAC) [40], developed by Ron Thomson, provides free, unlimited HVPT perception-based vowel and consonant identification practice. Users may personalize their online experience by defining the level of difficulty and the target sound(s) to practice. Automatically generated result reports may be used to pinpoint problem areas that can be addressed in subsequent practice attempts. Other customizable features include the following: the length of each practice tests (20, 100 or 200 questions); the number of retries (1-3 times) after a wrong answer; the use of color coding,



phonetic symbols, or different key words representing the target sound, and “record” and “playback” buttons for production practice.

[Forvo.com](#) [41] is known as one of the world’s largest multilingual online pronunciation resource with more than 430 languages represented. This resource can provide extensive opportunities for learners to listen and compare phonetic variability across phrases and individual words recorded by multiple NSs. [YouGlish.com](#) [42] is a multilingual search engine that can find authentic YouTube video clips in which the desired word or phrase is pronounced. Search criteria can be set to locate speech samples in different regional accents, parts of speech (nouns vs. verbs), or by the gender of the speaker. To create a collective bank of reliable web resources, teachers are advised to provide clear guidelines as to which multimedia sources can be used safely and responsibly as language models and to invite learners to share their own findings.

5. Recommendations

For HVPT Design

For those teachers who wish to develop their own HVPT materials, here are some considerations.

- HVPT should account for individual differences rather than a “one-size-fits-all” approach [37, p. 189]. For example, the target sounds should be represented simply, such as with keywords, phonetic symbols or colors that do not add processing difficulties for weaker learners.
- HVPT tasks should entail identifying the target sound in a forced choice task, rather than asking learners to discriminate whether two sounds are the same or different [38].
- When selecting audio files or recording them, it is important to validate the input before providing it to learners. One or more NSs should check the language models to ensure target accuracy. This can be done through transcription or word-matching tasks to exclude those that do not correspond. As the intended goal of improving L2 perception and production is foremost to arrive at clear communication between humans, validation of the phonetic input with AI should be also validated by humans.
- For independent practice, an online learning management system (LMS), such as Moodle, can be helpful in delivering large amounts of randomized listening practice tests with customizable feedback directing attention to relevant acoustic cues (e. g., duration) and other features. Moodle [43] also has Certainty-Based Marking (CBM), allowing learners to identify the degree of certainty of each answer on a 3-point scale. This will provide objective indicators to teachers and to the learners themselves as to how well they are perceiving the target sounds, especially after multiple attempts. If it is not possible to implement this form of automatic rating, learners may be encouraged to reflect on the degree of certainty of their judgments in their S-As.

For Self-Assessment

In addition to online resources, learners can be encouraged to actively seek out meaningful L2 human interactions with a variety of unfamiliar voices which vary by age, gender, socioeconomic class, and L1. In their S-As, students should be encouraged to reflect on their experiences and report the features and idiosyncracies they observe.

Each step of the communicative framework (description and analysis, listening discrimination and controlled practice, guided practice and communicative practice) can include an element of S-A. S-A assignments can be an opportunity for learners to reflect on their perceived degree of understanding of new and previous notions and to track their progress from one S-A to the next. Observations can be made as to where the most common errors occurred, how similar or different the sounds seem to those in their L1 or how many repetitions were needed to pass a perception task. They can reflect on what acoustic cues they were anticipating or attending to and what follow-up perceptual or articulatory adjustments need to be made. These forms of S- A can be helpful in encouraging students to engage in their own error detection as they continue to the production stages of the framework.

With regards to the pronunciation integration framework, L2 pronunciation learners may not always know what their pronunciation needs are [9] nor how to assess them realistically or truthfully [31]. Students should be encouraged to reflect on what their long-term and short-term goals are and how those relate to the instructional goals. A language background questionnaire or “first class” discussions about their previous language experience may also provide food for thought and provide teachers with insights into training priorities for individual learner profiles in the class. At the S-A design stage, it is



understood that S-A is a skill that needs to be taught explicitly and scaffolded: the value of this type of activity as well as teacher expectations of the task (assessment criteria) should be clarified. Also, models and rubrics of S-A and instruction should be provided as students put their S-A skills into practice through multiple opportunities to review and improve themselves based on their own assessment and the teacher's. Students may get impatient or get discouraged if they cannot detect any production improvement. Knowing that perception skills normally develop before production skills [44] and that changes to pronunciation may be small in comparison to gains in perception [45] could motivate students to persevere.

Self-assessments should be based on a phonetically rich diagnostic text. The baseline recording of the read-aloud text and an open-ended speech sample [44] are best taken as early in the course as possible. Both teacher and learner should give the initial recording a score, for example, on a scale of 1 to 10 [32] against which later S-As are judged. These should take place at periodic intervals and at the end of the course.

The design of L2 self-assessment grids (or rubrics that can be used on the LMS) should scaffold the increasing complexity and difficulty of the phonetic skills to be developed from one periodic evaluation to the next:

- New phoneme features to monitor and assess, especially less salient acoustic cues, should come with clear criteria to check off. A checklist in a table or grid format could be useful, especially in early attempts to self-assess.
- As the course progresses, assessment of older phonetic topics/features can be removed from checklists and replaced as open-ended, written and/or spoken development questions. A minimum required word count for written analyses or a minimal recording time that does not count silence or repetition may encourage in-depth analysis.

6. Conclusion

This reflection paper was intended to guide L2 pronunciation teachers into areas of potential action research and improved classroom intervention with S-A and HVPT.

HVPT can help bonify S-A by providing objective, measurable technology-based feedback that can be followed up on with teachers and the learner's own continued knowledge. S-As can also further bring to light perceived strengths and weaknesses in error detection, leading to better developed HVPT-based class materials. However, care should be taken by instructors to evaluate the amount of time and effort necessary to implement S-A and HVPT individually or in complementarity to current practice.

Researchers and practitioners still have much to explore in the fields of S-A, phonetic category development, and HVPT. For example, how long or involved should self-assessment tasks or HVPT training modules be to have minimal effectiveness? Can AI be used to provide effective feedback? Thus, teachers should not feel pressure to make sweeping modifications to their current practice, but rather small, incremental changes as the current understanding of L2 speech development evolves and better informs L2 phonetic instruction.

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