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Pronunciation learner autonomy: The potential of Automatic Speech Recognition



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ABSTRACT

In pronunciation learning, students are often hampered in their attempts to study or practice autonomously by their limited abilities to monitor their speech for errors. Automatic Speech Recognition (ASR) has great potential for providing feedback, allowing students to become more autonomous pronunciation learners. This study examined the effect of ASR use as part of a three-week pronunciation workshop on students' autonomous learning beliefs and behaviors. The study utilized three groups: 1) CONV: conventional face-to-face pronunciation training workshop (n = 15), 2) STRAT: mostly conventional with minimal ASR strategy training (n = 17), and 3) HYBRID: hybrid with half of workshop time using ASR (n = 16). Changes in beliefs and behaviors were tracked using pre-, post-, and delayed post-workshop surveys, along with interviews and weekly learning logs. Results showed that while CONV reported no significant change, groups introduced to ASR, STRAT and HYBRID, significantly increased their beliefs of autonomy from the pre- to post-workshop survey and pointed to the feedback from ASR as enabling them to practice autonomously. However, after the workshop ended, HYBRID reported significantly more time spent on autonomous pronunciation learning and more use of ASR than STRAT and CONV, highlighting the need for a gradualist approach to autonomy through repeated practice with ASR.

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1. Introduction

Students learning English as a second language often recognize a need or desire to work on their pronunciation (McCrocklin & Link, 2016; Levelle & Levis, 2014; Yamaguchi, 2002). Unfortunately for these students, pronunciation is often downgraded as a teaching goal and pushed aside in favor of other skills (Isaacs, 2009; Kelly, 1969; Lang, Weng, Shen, & Wang, 2012). Students need skills and strategies that will empower them to practice their pronunciation on their own, so that they will not be as reliant on a teacher or school for pronunciation training. In effect, students need to learn to become autonomous learners of pronunciation.

Unfortunately, pronunciation is not always an easy skill to develop autonomously. Pronunciation learning is a complex task, not only demanding knowledge of appropriate sounds in particular contexts, but also demanding that students learn to use their vocal apparatus to make those sounds, which requires extensive practice and feedback. Students struggle to monitor themselves (Beddor & Strange, 1982; Blankenship, 1991; Flege, Munro, & Fox, 1993) which can lead them to feel dependent on

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an instructor for feedback. Moreover, conventional pronunciation teaching is unlikely to help students develop autonomy because such classrooms often rely on the teacher to model correct pronunciation and to monitor, evaluate, and give feedback on student production (Baker, 2014; Celce-Murcia, Brinton, & Goodwin, 2010; Foote, Trafimovich, Collins, & Soler Urzúa, 2013).

The ability to receive feedback on pronunciation without relying on an instructor is critical for autonomy (Sheerin, 1997) and there is a great need for practical tools and strategies that will give students this ability. This research study seeks to examine the use of Automatic Speech Recognition (ASR) as part of a pronunciation workshop in the hopes of empowering students to practice and improve their pronunciation autonomously.

2. Literature review

2.1. Conventional pronunciation teaching

Conventional pronunciation teaching involves mostly face-to-face classroom instruction with the teacher often leading the class in pronunciation activities. While initially relying heavily on drills, pronunciation teaching has evolved to allow for more communicative practice. Celce-Murcia et al. (2010) put forth a communicative framework for pronunciation teaching that suggested five main components to pronunciation teaching. It counseled that second language (L2) learners need to 1) develop the metacognitive knowledge to understand the pronunciation feature they are working to improve, 2) develop perceptual abilities to distinguish the new sounds, 3) make new sounds in controlled practice activities (controlled production), 4) pronounce while also focusing on meaning (guided production), and 5) develop automatic abilities to pronounce while communicating through communicative practice. Techniques offered to enact this framework rely heavily on the teacher for feedback; of the ten main teaching techniques introduced for teaching pronunciation as part of the Communicative Approach, only one, “recordings of learner’s production” clearly mentions making use of the student in the evaluation. Most of the other techniques, such as “listen and imitate” and “minimal-pair drills” rely heavily on the teacher to be the model of pronunciation and the monitor of student production (Celce-Murcia et al., 2010, p. 9–10). While Baker (2014) showed that teachers of pronunciation may have expansive teaching repertoires, employing much more than ten techniques, she also found that teachers rely heavily on controlled production activities, most using the teacher as model and monitor of pronunciation. Further, even in communicative activities the pronunciation focus is often created by the teacher evaluating student speech and providing corrections (Foote et al., 2013). These types of pronunciation classes seem unlikely to foster student autonomy because students are not encouraged to develop skills or strategies for monitoring or evaluating their own pronunciation.

The reliance on the teacher to provide feedback is not unreasonable; students struggle to monitor their own pronunciation in the L2 because sounds are filtered through their first language (L1) (Beddor & Strange, 1982; Blankenship, 1991; Flege et al., 1993). Filtering through the L1 can lead an L2 learner to make distinctions that are inappropriate for the L2 and may prevent learners from identifying pronunciation errors when they make them.

Research in pronunciation learning strategies has struggled to provide methods for autonomous pronunciation practice in which students can also get clear feedback to help them improve. For example, work by Dickerson (1994) and Sardegna (2009, 2012) suggested that students can be empowered with a combination of predictive rules about language, such as spelling patterns, and a language learning strategy, covert rehearsal, in which students practice language privately making use of the predictive rules. Several research studies have found that students value self-monitoring and self-correction strategies and research into the strategies’ effectiveness has shown that self-monitoring and self-correction as part of private practice is useful for the development of suprasegmentals, such as stress and pitch (Chang, 2012; Ingels, 2011; Sardegna, 2009). However, monitoring one’s own pronunciation for segmentals (consonant and vowel phonemes) requires the ability to create aural discrimination categories appropriate to the L2, a skill that has been shown to be lacking for many students. While some textbooks such as Celce-Murcia et al. (2010) suggested students audio-record their speech to identify errors, the strategy of recording oneself does not significantly improve students’ abilities to hear their deviations from the L2 sound system (Foote, 2010).

While there is potential for pronunciation practice and learning to be autonomous (Dickerson, 1994; Kruk, 2012; Sardegna, 2012), the task may be daunting or overwhelming to students who struggle to hear their own pronunciation errors (Foote, 2010), especially those not familiar with tools that can help them. In order for this potential to be reached and maximized, students need evidence-based strategies, skills, and tools that empower them to experiment with pronunciation without relying on the teacher for constant monitoring and feedback. Yet there is very little research that has examined autonomy in pronunciation learning. After extensive searching, only one research study, Kruk (2012), surfaced that specifically aimed to examine autonomy in the realm of pronunciation. Books with a focus on autonomy tend to avoid pronunciation topics, such as Allford and Pachler (2007) and Benson (2011), which focused mostly on literacy and grammar. Few sources address how students can become autonomous learners in the realm of pronunciation.

2.2. Autonomy

Henri Holec, the first to apply autonomy to the field of language learning, defined autonomy as “the ability to take charge of one’s learning” (1981, p. 3). Holec (1981) stated that an autonomous learner would have all responsibility for decisions

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