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Visual feedback and second language segmental production: The generalizability of pronunciation gains

Heather M. Offerman*, Daniel J. Olson

Purdue University, United States

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ABSTRACT

While a number of researchers have noted the lack of research on pronunciation instruction, relative to other aspects of language (i.e. syntax), pronunciation has been shown to be crucial for facilitating intelligible and comprehensible second language (L2) productions. Addressing the need for empirically tested pedagogical methods, the current study considers the use of a classroom-based visual feedback paradigm for the instruction of a segmental feature, namely voice onset time, which has been shown to be a distinctive marker of accent for English-dominant L2 learners of Spanish. In addition, this study examines the potential generalizability of gains made through the visual feedback paradigm, assessing whether gains made in controlled reading tasks (i.e. carrier sentences) will extend to more continuous and spontaneous speech. The results demonstrate significant improvements in voice onset time produced by participants following the visual feedback paradigm, relative to a control group. Furthermore, while the visual feedback training was limited to short, controlled utterances (i.e. carrier sentences), benefits were observed for more continuous and spontaneous speech.

1. Introduction

Within the field of second language acquisition, pronunciation has received relatively little attention, particularly with respect to the more prominent areas of morphology and syntax (Deng et al., 2009). However, highlighting the importance of pronunciation in language acquisition, research has shown that pronunciation has clear impacts on conveying meaning effectively (i.e. comprehensibility) and efficiently (i.e. intelligibility), and that accentedness in a second language (L2) may drive unwanted negative evaluations of L2 speakers by native speakers of the target language. As such, a number of researchers have begun to call for empirically-based research on pronunciation instruction (e.g. Wang & Munro, 2004). This lack of research can also be seen in the general lack of systematic pedagogical materials for pronunciation training, effectively reinforcing the "marginalized" nature of pronunciation in the second language classroom (Derwing & Munro, 2005, p. 382). In spite of this general lack of attention on pronunciation, students desire to learn more about pronunciation and believe that it is a critical component of L2 learning (Levis & Grant, 2003).

A growing body of research has begun to investigate new methods of instruction for L2 pronunciation, one method of particular interest has come to the forefront, combining pronunciation instruction with speech analysis technology. Specifically, visual feedback paradigms, seeking to aid learners in not only hearing their errors, but visualizing these errors, have

* Corresponding author. 640 Oval Dr. West Lafayette, IN 47904, United States.
E-mail address: hofferma@purdue.edu (H.M. Offerman).

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been the subject of interest and investigations for several decades (for review see Chun, 1989). More recently the effectiveness of visual feedback for training at the segmental level (i.e. vowels and consonants) has been considered, albeit with somewhat varying results (e.g. Saito, 2007; Ruellot, 2011). While there is tacit support for the utility of visual feedback at the segmental level, further research on a variety of features is needed to confirm these findings. Furthermore, the support for the effectiveness of visual feedback has seemingly ignored the issue of generalizability, or whether gains made during training in restricted contexts may extend to more naturalistic speech.

Addressing these gaps, the current study investigated the effectiveness of visual feedback in aiding English-speaking L2 learners of Spanish to produce more target-like pronunciation of a segmental feature not previously addressed in the visual feedback literature, namely the voiceless stops (i.e./p, t, k/). The visual feedback paradigm was used in order to highlight differences in voice onset time (VOT) values in English as opposed to Spanish, through comparisons of spectrograms and sound waves. Furthermore, the present study also sought to determine whether or not L2 learners were able to not only produce the target-like productions of /p, t, k/ in carrier utterances, but also in continuous controlled speech and spontaneous speech. Broadly, the positive results have both pedagogical and theoretical implications, highlighting the potential utility of visual feedback for pronunciation training.

2. Review of the literature

2.1. Pronunciation: intelligibility, comprehensibility, & accentedness

As L2 learners develop pronunciation skills, they are faced with issues of intelligibility, comprehensibility, and accented speech. *Intelligibility* is broadly defined as the extent to which an utterance is actually understood by the listener (Derwing & Munro, 2005). For L2 learners, many researchers have shown a link between pronunciation and intelligibility, with non-target-like pronunciation leading to decreased intelligibility (Derwing & Munro, 1997; Derwing & Munro, 2009; Derwing, Munro, & Wiebe, 1998; Levis, 2005; Levis & Grant, 2003; Munro & Derwing, 1995, 1999; Simões, 1996; Sturm, 2013). While intelligibility is an indicator of how much is understood, *comprehensibility* can be seen as degree of ease or difficulty with which an utterance can be understood (Derwing et al., 1998). In the case of non-native speakers (NNS), learning or acquiring the ability to produce intelligible and comprehensible communication has been discussed as a primary goal.

As defined by Derwing and Munro (2009), *accentedness* can be described as "how different a pattern of speech sounds to a local variety" (p. 478). Although accentedness does not always correlate directly with intelligibility or comprehensibility for a NS listener (Derwing & Munro, 1997), it can impact NS perceptions about the NNS (Derwing & Munro, 2009; Gluszek & Dovidio, 2010; Kim, Wang, Deng, Alvarez, & Li, 2011; Purkiss, Perrewé, Gillespie, Mayes, & Ferris, 2006). Munro, Derwing, and Sato (2006); for example, a non-native-like accent may cause a NS to determine that the NNS is ignorant in their L2.[1] Furthermore, if a foreign accent is detected, NSs may determine that a NNS is not fluent in the target language, despite the NNS's use of correct syntax or grammar (Gluszek & Dovidio, 2010).

In short, for L2 speakers, pronunciation represents a major component for both expressing an easily understandable message (i.e. intelligibility and comprehensibility), as well as shaping listeners' perceptions (i.e. accentedness). Given the potential impacts on intelligibility, comprehensibility, and accentedness, pronunciation instruction is essential in aiding L2 learners to achieve communicative goals.

2.2. Approaches to L2 pronunciation instruction

Although second language pronunciation clearly has ramifications for intelligibility, comprehensibility, and accentedness, relatively little attention has been given to the teaching of pronunciation (Arteaga, 2000; Derwing & Munro, 2005; Elliott, 1995, 1997; Isaacs, 2009; Lord, 2005; Saalfeld, 2011; Saito, 2011, 2013; Simões, 1996), particularly in comparison with grammatical and syntactic features. Pennington and Richards (1986), for example, explain how pronunciation has been set aside as mere "linguistic competence" rather than "communicative competence" in more recent methods of instruction (p. 207). In other words, learning about pronunciation has been considered to be too detailed and too advanced for L2 learners, and they are taught mainly to focus on communicating an idea by using as much implicitly acquired knowledge as possible.

Beginning to address this need, there is a growing body of research that has shown a clear benefit for incorporating pronunciation instruction in the L2 classroom. Much of this work has addressed the potential impact of a variety of pedagogical or laboratory-based interventions, including auditory exposure (Neufeld, 1978), auditory discrimination training (Rosenman, 1987), awareness training (Pennington & Ellis, 2000), explicit articulatory instruction (Castino, 1996; González-Bueno, 1997), and a variety of mixed methods (Couper, 2003, 2006; Derwing & Rossiter, 2003; Elliot, 1997; González-Bueno, 1997; Lord, 2005; Santos Maldonado, 1994; for explicit instruction and immersion see Lord, 2010). For example, explicit articulatory instruction, in which students focus on learning parts of the vocal apparatus, has been shown to significantly

[1] Native listeners have also been shown to judge different and non-standard varieties (e.g. social, geographical, racial, etc.) of their own language (for Spanish see Blas Arroyo, 1999), attributing both positive and negative characteristics to different varieties. While voice onset time, the focus of the current study, has been shown to vary minimally across various varieties of Spanish (e.g., Williams, 1977), it is worth considering and discussing with students the implications of the variety of any language used in pronunciation instruction.