The effects of explicit pronunciation instruction on the degree of perceived foreign accent in the speech of EFL learners[*]

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Abstract
This paper reports on a study that attempted to examine the effect of explicit pronunciation instruction of some English segments (individual sounds) on the degree of perceived foreign accent in EFL Arab learners' speech. Nine Arab learners of English in an EFL (English as a foreign language) setting were assigned to two groups, experimental and control. Five utterances loaded with the taught segments were collected from both groups before and after instruction. While the experimental group received instruction on these segments, the control group did not. 13 native English listeners were recruited to rate all the elicited sentences for the degree of perceived foreign accent. The results did not show any effect of explicit pronunciation instruction on the degree of perceived foreign accent, as there were no differences between the ratings before and after the instruction.

Keywords: Arab EFL learners, instruction, pronunciation, segments, foreign accent

1. Introduction

While foreign accent is almost always an unavoidable consequence of learning a language after the age of early childhood (Flege, Munro and MacKay, 1995), second and foreign language speakers vary in the degree of perceived foreign accent in their utterances (Piske, MacKay and Flege, 2001). Piske et al. (2001) reviewed the literature to determine what factors lead to the variation observed among second language speakers in term of the perceived degree their foreign accent. They reported that formal language instruction was generally shown not to have an effect on the degree of L2 foreign accent. They suggested that this lack of effect of formal language instruction might be attributed to the fact that pronunciation is usually given little attention in most foreign language classrooms.

A number of studies have examined whether pronunciation instruction bears any positive effect on the pronunciation of second and foreign language learners (e.g., Champagne-Muzar, Schneiderman and Bourdages, 1993; MacDonald, Yule and Powers, 1994; Derwing, Munro and Wiebe, 1997; Elliott, 1997; Derwing,

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Munro and Wiebe, 1998; Couper, 2006; Saito, 2011; Saito and Lyster, 2012; Kissling, 2013). Results have shown that pronunciation instruction is generally effective in improving learners' pronunciation (Saito, 2012; Lee, Jang and Plonsky, 2015; Thomson and Derwing, 2015). However, because of the large methodological differences between these studies in terms of objectives, as well as type and duration of instruction, much more studies are still needed to show how pronunciation instruction can improve learners' pronunciation (Thomson and Derwing, 2015). For example, while some studies focused on the effect of teaching segmentals (e.g., Saito, 2011; Kissling, 2013) on L2 pronunciation, others focused on teaching suprasegmentals (Derwing et al., 1997; Kennedy and Trofimovich, 2010; Saalfeld, 2011).

Previous studies that have examined the effect of the explicit teaching of segmentals on L2 pronunciation accuracy yielded mixed and contradictory results (Kissling, 2013; Thomson and Derwing, 2015). While some showed improvement of L2 pronunciation others did not. These studies are reviewed below.

2. Literature review

One of the earliest studies that attempted to study the effect of pronunciation instruction on L2 pronunciation is Elliott (1997). It examined whether pronunciation practice (e.g., repetition & feedback) of Spanish segments would lead to improvement in the pronunciation accuracy of these segments among native English learners. The results were mixed and showed that while improvement was observed in the production of liquids and stops, there was no significant improvement in the production of fricatives, nasals and vowels. Another often-cited study is that of Derwing et al. (1998, which examined the effect of explicit pronunciation instruction of English speech sounds on the degree of perceived foreign accent in the speech of L2 English learners. L2 learners from different L1 backgrounds were asked, before and after instruction, to read a number of sentences and to extemporaneously describe a story presented to them in a picture. While instruction helped to decrease the overall perception of foreign accent in their sentence reading production, it did not provide any benefit for their extemporaneous narrative production.

Despite the fact that research on pronunciation instruction still seems to lag behind research on other aspects of language teaching, the last ten years have witnessed a surge in the number of empirical studies that have focused on pronunciation teaching (Thomson and Derwing, 2015). A number of these studies have focused on the effect of teaching segments or individual sounds on the accuracy of L2 pronunciation (Derwing and Rossiter, 2003; Lord, 2005; Saito, 2007; Lord, 2010; Saito, 2011; Saito and Lyster, 2012; Kissling, 2013; Saito, 2013; Sturm, 2013; Derwing, Munro, Foote, Waugh and Fleming, 2014; Kennedy, Blanchet and Trofimovich, 2014).

Derwing and Rossiter (2003) showed that the teaching of segments or individual sounds to L2 English learners, who were of different L1 backgrounds, was not effective in reducing the degree of perceived foreign accent in their speech. Lord (2005) studied the effect of teaching nine Spanish sounds to native English learners on the accuracy of their production of these sounds. The results showed improvement accuracy for most sounds. Saito (2007) showed improvement in the production of English /æ/ by Japanese EFL learners after receiving phonetic instruction. Saito (2011) provided explicit phonetic training on eight English sounds to L2 Japanese learners of English. No effect of instruction was found on the degree of perceived foreign accent in the speech of the L2 learners. In Lord (2010), English learners of Spanish who had taken a Spanish phonetics course were found to be more accurate than those who did not in producing three Spanish allophones. However, it is difficult to attribute this advantage to pronunciation instruction, as no data prior to instruction was available. Saito and Lyster (2012) showed that pronunciation instruction combined with corrective feedback had a positive influence on the accuracy of English /r/ by non-native Japanese learners. Kissling (2013) examined the effect of phonetic and pronunciation instruction on the production of eight Spanish phones by non-native English learners. She found that both the phonetic and pronunciation instruction was effective in improving the accuracy of the learners' production of the target phones. Sturm (2013) found that a course in French phonetics given to non-native French learners was effective in improving their overall accuracy of French pronunciation. Derwing et al. (2014) examined the effect of a short-term pronunciation instruction on the perceived degree of foreign accent in the speech of seven L2 English speakers who had lived in an English speaking country for an extended period of time (range: 19-23 years). The results showed no effect of instruction on the degree of foreign accent. Kennedy et al. (2014) reported a reduction in segmental errors in the speech of L2 French speakers after undertaking a listening/speaking course in French.

It is clear from the above overview that the results are ambivalent with respect to whether pronunciation instruction of segments is effective in reducing the degree of foreign accent. It should be noted that a number of previous studies have rightly advocated and focused on the effect of pronunciation instruction on speech comprehensibility. However, foreign accent can be detrimental to speech comprehensibility, as it has been found that speaking with a foreign accent can sometimes render speech incomprehensible (Munro and Derwing, 1995). Moreover, sounding more native-like is still a goal for many second and foreign language learners (Timmis, 2002). More studies are still needed to draw a strong conclusion on the effect of pronunciation or phonetic instruction on the degree of perceived foreign accent in the speech of second and foreign language speakers. As it is well-known that language learners' L1 can affect their production of L2, and that the degree of foreign accent in their speech may be sometimes related to their L1 (Piske et al., 2001), it can be argued that the efficacy of pronunciation teaching on L2 production may vary depending on the learners' L1.

3. The current study

The current study attempted to further examine the influence of explicit segmental pronunciation instruction on the degree of perceived foreign accent. It used a quasi-experimental pre/postintervention design, where EFL learners' speech production was collected before and after pronunciation instruction. Native English listeners were then recruited to rate the degree of perceived foreign accent for all the collected data. The data were then analyzed to assess whether there was a reduction in the degree of perceived foreign accent. The current study specifically addresses the following question:

Q: Is explicit pronunciation instruction of English sounds/segments effective in reducing the degree of perceived foreign accent in the speech of EFL Arab learners?

4. Method

4.1. Speakers/learners

Initially, 18 Arab EFL learners (N=9 for the experimental group and $N = 9$ for the control group) were recruited to provide the data for the present study. However, because of the lengthy nature of the intervention (i.e., the pronunciation instruction course), four of the participants in the intervention/experimental group dropped out of the course (N=1) or missed many classes (N=3). This resulted in reducing the number of participants to nine (N=5 in the experimental group and N=4 in the control group). It was decided during the post-test data collection to record only five speakers in the control group to make the number comparable to the number of participants in the experimental group. One of the participants in the control group was later excluded for sound quality issues.

All the participants (N=9, 5 in the experimental group and 4 in the control group) were male first-year students (age range 19-20 years) at Taif University in Saudi Arabia majoring in computer science. They were all native Arabic speakers. None of them reported that they had ever lived in an English speaking country. They all had equivalent education in Saudi public schools, where English is taught as a subject in the curriculum. It should be noted here that English is considered a foreign language in Saudi Arabia, and Arabic is the main medium of teaching for all subjects, except for English. All the participants had undertaken a preparatory year at the University, where English is taught as a core subject, before they joined the computer science department.

The speakers were recruited when they were attending a course in English for computing (six hours spread over a week for the duration of a 15-week semester) during their second year at the University. Apart from listening to audio conversations related to computing between native speakers of English, the English for computing course did not involve any pronunciation instruction. It was

mainly designed to equip the students with appropriate English terminology used in computing. All students, including those in the experimental group, attended these classes.

During week two of the course, the teacher, who is also the researcher of the current study, asked the students whether they were interested in attending a pronunciation instruction course for a ten-mark credit. Those who did not want to take part where given the chance to get a similar ten-mark credit by translating 100 English computing words into Arabic. Nine students showed interest, and accepted the offer to attend the pronunciation instruction course. They met the researcher for an hour a week in a language lab at the English Language Centre at Taif University that followed a regular one-hour English for computing class that they had had with all the other students.

4.2. Pronunciation Instruction

The pronunciation instruction was delivered in 11 hours spread over 11 weeks (one hour per week). It was taught by the author of the current research, who is a non-native speaker of English and has a PhD in Linguistics that specialized in second language speech. It may be argued that a native speaker is the ideal teacher of any pronunciation instruction course. However, it has been shown that non-native teachers of English can be as competent as native speakers in teaching pronunciation (Levis, Sonsaat, Link and Barriuso, 2016). Moreover, given the fact that the majority of English language teachers around the globe are non-native English speakers (Selvi, 2014), it is worthwhile investigating the efficacy of teaching pronunciation by non-native speakers. It should be also noted that all the multimedia used in class featured native English speakers. For example, the students were asked to listen to and repeat sounds after a native speaker presented to them via either a cd player or a computer screen projector.

The following English segments were chosen for the pronunciation instruction course on the basis of cross-linguistic comparison between Arabic and English, and previous studies that have reported on the pronunciation difficulties experienced by Arab EFL learners (Flege and Port, 1981; Altaha, 1995; Ahmad, 2011)**:** /p, v, tʃ, ɹ, ŋ, e, æ, ʌ, ɒ, ɔ: & ɜ:/. Each week was assigned to the instruction of a single sound.

The instruction began with introducing the students to the sound being taught by presenting the grapheme-phoneme correspondence between the sound's phonetic symbol using IPA and its orthographic manifestations. This was followed by an articulatory phonetic description of how the sound is produced (e.g., place & manner of articulation) with the help of an online version of the phonetic software *Sound of Speech* (developed by the University of Iowa, see web references below), which presents a graphic motion of how the articulators are used in producing the sound. The software also features a video of a native speaker carefully producing the sound in isolation and in the context of word examples. This was followed by listening practice in which the students were asked to listen

carefully to the sound produced in isolation and in context (words & sentences) by a native speaker of English. The students were then asked to listen again and repeat the same sound as produced by the native English speaker in isolation and in context (i.e., word examples), and were given feedback on their repetition. Two sources were used for the listening and repetition exercises: the book *English Pronunciation in Use Intermediate* (Hancock, 2012), and the BBC English pronunciation website (web references below), which features videos for each English phoneme (description, word examples listening and repetition) by a phonetician who is a native English speaker. These sources also provide listening discrimination exercises where each sound is compared to another similar English sound which may confuse students (e.g., /p/-/b/ & /v/-/f/). Afterwards, a cross-linguistic comparison between Arabic and English with regard to the sound being taught was presented to the students. For example, it was explained that the phonemic inventory of Arabic lacks /p/ and /v/, and that unexperienced EFL Arab learners are likely to produce /b/ and /f/, respectively, when they try to produce these sounds. The class ended with communicative practice of the sound under study, and corrective feedback was provided when the teacher thought the student had mispronounced the sound. For this final step, a sentence containing a proposition with key words that have the sound under study as one of its segments was presented to the students for discussion. Students were encouraged to give their opinions about the proposition and engage in the discussion. The teacher provided recast feedback on the students' mispronunciation of the sound.

4.3. Foreign accent rating

4.3.1. Stimuli

Five English sentences with high-frequency words and loaded with the sounds taught to the students (see Appendix A) were elicited from all the students before (week 3) and after (week 15) the pronunciation instruction. The recording took place in an English Language Centre language lab at Taif University. The students were recorded individually by using Praat software (Boersma and Weenink, 2016). They were asked first to read the sentence silently, and then listen to all the sentences as spoken by a native English speaker. They were then asked whether they had any questions about any unfamiliar words in the sentences. The students then read all the sentences aloud into a microphone. The same procedure was followed for both the pre- and post-test recordings. None of the students received training or instruction on how to produce any of the recorded sentences. 90 sentences (5 pre + 5 post x 9 speakers = 90 sentences) were extracted and used for the accent rating phase.

4.3.2. Listeners

13 male native English listeners (*N*=4 American English speakers and *N*=9 British English speakers) who were male English language teachers at Saudi Universities

participated in the perceptual judgement phase. Each listener received an honorarium of 50 SR for his participation.

4.3.3. Procedure

The sentences were presented to the listeners in five consecutive blocks. Each block contained one sentence (1 sentence produced two times by 9 speakers = 18). All the sentences in each block were randomized. The listeners were tested individually. The sentences were presented to the listeners through a computer via headphones using the Praat Experiment-MFC interface (Boersma and Weenink, 2016). The listeners were asked to rate each sentence for the overall degree of perceived foreign accent on a nine-point Likert scale (1 = no foreign accent, 9 = very strong foreign accent). They were encouraged, where possible, to use the full range of the scale. The scale was presented on the computer screen where the listeners clicked on the degree chosen and then asked to confirm their rating. After this confirmation rating they could change their mind.

5. Results

An interclass correlation coefficient, using Cronbach's alpha, was performed to measure the degree of agreement between the 13 raters with regard to their accent ratings for each speaker. The results showed high interclass correlations for the pre-instruction and post-instruction ratings, .91 and .85, respectively. This means that the raters were consistent in their ratings.

Each listener's individual rating for each sentence without aggregation or averaging across speakers was entered into a linear-mixed effects model with Time (pre-instruction vs. post-instruction), Group (experimental vs. control) and their interaction as fixed factors and with Listener, Speaker, and Sentence as random factors. The model included both random intercepts and random slopes for maximal random structure (Barr, Levy, Scheepers and Tily, 2013). The results did not show any significant effect for any of the fixed factors: Time (β= -0.003, SE= 0.18, t= -0.01, $p > 0.05$), Group (β= 0.41, SE= 0.35, t= 1.18, $p > 0.05$), Time*Group (β= 0.16, SE= 0.27, t= 0.59, $p > 0.05$). The results, illustrated by Figure 1 below, clearly show that there was no effect of pronunciation instruction on the degree of perceived foreign accent.
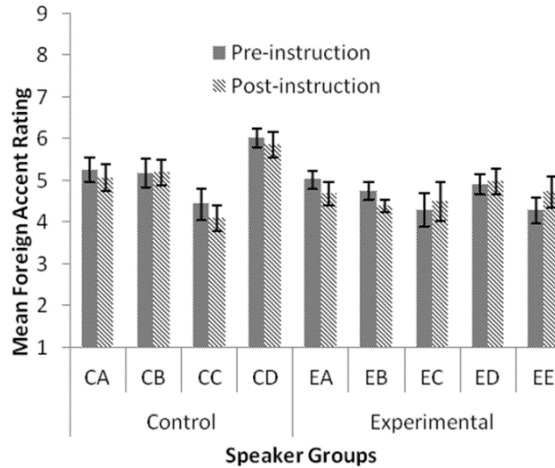
Figure 1. Pre- and post-instruction mean foreign accent ratings for all learners (bars represent standard errors).

6. Discussion

Previous studies on the efficacy of explicit teaching of segments or individual sounds on the degree of perceived foreign accent or pronunciation accuracy have shown contradictory results. While some have shown an effect of pronunciation instruction (Derwing et al., 1998; Kissling, 2013; Sturm, 2013) others have not (Derwing and Rossiter, 2003; Saito, 2011; Derwing et al., 2014). The results of the current study provide support for previous studies showing no effect of segmental pronunciation teaching on the degree of perceived foreign accent. However, because of the large methodological differences between these studies, it is very difficult to compare results across previous studies and to reach a strong conclusion about the efficacy of segmental pronunciation instruction on L2 pronunciation accuracy or accent. Methodological differences between previous studies include duration of instruction, method of assessing speech and learners' L1 background. Table 1 below presents these differences between previous studies. One noticeable difference is that all the studies that used accent rating, except for Derwing et al. (1998), did not find an effect for pronunciation instruction. It is possible that using foreign accent judgement is not an appropriate way of measuring the efficacy of teaching segments, as other factors, such as suprasegmentals and speech rate, which can also have an impact on the overall degree of perceived foreign accent (Munro, 1995), were not controlled for. On the other hand, the studies that used accuracy measurements showed improvement after instruction (Kissling, 2013; Sturm, 2013). The question that then arises is whether these improvements have no effect on the overall degree of perceived

foreign accent, given the fact that many non-native speakers wish to reduce their foreign accent (Timmis, 2002). Future studies may find an answer to this question.

Table 1. A summary of previous studies on the effect of segmental instruction on L2/FL pronunciation.

Study	Target Language	Learners' L1	Instruction duration in hours	Assessment method	Pronunciation improvement
Derwing et al. (1998)	English (ESL)	Mixed L1 backgrounds	20	Accent rating	Yes (read speech only)
Derwing & Rossiter (2003)	English (ESL)	Mixed L1 backgrounds	20	Accent Rating	No
Saito (2011)	English (ESL)	Japanese	4	Accent Rating	No
Kissling	Spanish (SFL)	English	1 to 2 (self-paced)	Sound production accuracy	Yes
Sturm (2013)	French	English	37.5	Syllable production accuracy	Yes
Derwing et al (2014)	English	Vietnamese & Kmear	17	Accent Rating	No

A limitation to this study, as well as to many previous studies investigating pronunciation instruction, is the use of a small sample size. Giving the fact that different factors, along with instruction, such as L2 use, can also affect the degree of perceived foreign accent (Piske et al., 2001), future studies need to include a larger number of participants, and to examine their daily use of the target language.

7. Conclusion

Although the current study is consistent with previous studies, which are still few in number, in terms of showing no effect for segmental pronunciation instruction on the degree of foreign accent, it is yet not clear whether this lack of effect is due to real inefficacy of segmental pronunciation instruction or to the use of inadequate measurement of degree of foreign accent. In particular, the use of rating of global foreign accent makes it difficult to tease apart the effect of improvement in segments pronunciation, if any, from the effect of other factors, such as suprasegmentals, on the degree of perceived foreign accent. Further

studies are still needed to reach any strong conclusion on the efficacy of teaching segments on the degree of perceived foreign accent.

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Appendix: Sentences used in pronunciation assessment

1. The cat left the bed and sat on the chair.
2. The girl bought a box of chocolate early Monday.
3. He is reading the page about the story of the van.
4. He must visit his dad next Thursday.
5. They can pass the test if they study.