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Effects of Instruction on L2 Pronunciation Development: A Synthesis of 15 Quasi-Experimental Intervention Studies

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■ Over the past 25 years second language (L2) acquisition research has paid considerable attention to the effectiveness of instruction on L2 morphosyntax development, and the findings of relevant empirical studies have been extensively summarized using narrative review methods (e.g., Ellis, 2002) as well as meta-analytic review methods (e.g., Spada & Tomita, 2010). These researchers have reached a consensus that (a) integrating language focus into meaning-oriented classrooms is more effective than a purely naturalistic approach, and (b) contextualized grammar teaching methods (e.g., focus-on-form instruction, form-focused instruction) is more effective than decontexualized grammar teaching methods (e.g., focus-on-formS instruction, grammar-translation method). What is surprising in this vein of L2 acquisition studies, however, is the lack of research in the area of L2 pronunciation development. Pronunciation teaching has been notorious for its overdependence on decontextualized practice such as mechanical drills and repetition, reminiscent of the audiolingual teaching methods of several decades ago (for discussion, see Celce-Murcia, Brinton, Goodwin, & Griner, 2010). Furthermore, very few language teachers actually receive adequate training in the specific area of pronunciation teaching (Foote, Holtby, & Derwing, 2011).

In recent years, several researchers have made strong calls for research on teaching for *intelligible* (rather than *native-like*) pronunciation. Their reasoning is that, while maintaining their first language (L1)-related accents to a certain degree, students need to fulfill the minimal phonological requirements to be comprehensible in order to achieve the goal of successful communication (e.g., Derwing & Munro, 2005; Jenkins, 2000; Levis, 2005). In fact, we can see an increasing number of L2 pronunciation studies which extensively explore which pronunciation phenomena significantly affect speech intelligibility in successful communication between native speakers (NSs) and nonnative speakers (NNSs) (e.g., Isaacs & Trofimovich, 2012) as well as between NNSs and NNSs (e.g., Jenkins, 2000). These studies aim to set teaching and learning priorities and design optimal syllabi for teaching intelligible pronunciation in L2 classrooms. Following this line of thought, though much fewer in number, other L2 pronunciation researchers have begun to investigate how teachers should actually teach these key features by conducting intervention experiments whereby students receive some type of instruction with their gain measured via pre- and post-tests (i.e., quasi-experimental studies). Whereas most instructed L2 acquisition review articles have exclusively focused on grammar teaching, the current study took a first step towards conducting a research synthesis to summarize the state of the art of this emerging field—the pedagogical potential of pronunciation teaching. To answer some fundamental questions that are crucially relevant for both researchers and practitioners, the research questions for the current analysis are twofold:

1. To what extent do studies show that instruction is effective in L2 pronunciation development?
2. If so, do they suggest that its effectiveness vary according to (a) focus of instruction (segmentals vs. suprasegmentals), (b) type of instruction (focus on form vs. focus on formS), or (c) type of outcome measures (controlled vs. spontaneous production)?

METHOD

First, a careful screening was implemented to search for quasi-experimental studies which investigated the effects of instruction on L2 pronunciation development with a pre- and post-test design. Major journals in L2 education research (e.g., *Language Learning, Language Awareness, TESOL Quarterly*) as well as review chapters and articles on pronunciation teaching (e.g., Celce-Murcia et al., 2010; Munro & Derwing, 2011) were taken into account to check potential sources. Three widely circulated conference proceedings (i.e., *The Pronunciation*

in Second Language Learning and Teaching Conference, International Congress of Phonetic Sciences, New Sounds) were also examined to identify any relevant intervention studies. In order to grasp the recent trend in pronunciation teaching research, a decision was made to include not only studies published after 1990 but also those in press. Consequently, 15 pronunciation teaching studies with a pre- and post-test design were identified. While 12 studies were conducted in intact classes, the other three studies recruited participants who were randomly assigned to either experimental or control groups. With respect to target languages, the current study identified nine studies for English, four for Spanish, one for French, and one for an artificial language. In the following sections, the 15 studies were coded according to three independent variables: (a) focus of instruction, (b) type of instruction, and (c) type of outcome measure.

Focus of Instruction

Five of the studies included in our analysis focused on segmentals, and another seven examined suprasegmental-based instruction. For the segmental-based instruction studies ($n = 5$), while two studies highlighted the acquisition of one specific segmental feature (Saito & Lyster, 2012, for English /ɹ/; Lord, 2005, for Spanish voiceless stops), the other three studies generally targeted a range of segmental sounds (e.g., Elliott, 1997, for 19 allophones in Spanish; Derwing, Munro, & Wiebe, 1998, and Saito, 2011, for major English consonants and vowels).

For the suprasegmental-based instruction studies ($n = 7$), three studies generally covered crucial suprasegmental features such as speaking rate, intonation, rhythm, projection, word stress, and sentence stress (Derwing, Munro, & Wiebe, 1997, 1998[1]; Kennedy & Trofimovich, 2010) and another two studies highlighted specific suprasegmental feature of L2 (Abe, 2011, for English stress-timing; Saalfeld, 2011, for Spanish lexical stress). It needs to be noted here that another two studies (Cardoso, 2011; Couper, 2006) focused on the teaching of pronunciation rules regarding syllable structures (making students aware of epenthesis vowel insertion in consonant clusters). Following Cutler, Dahan, and van Donselaar's (1997, p. 142) definition of prosody in a broad sense (i.e., "the structure that organizes sound"), these two studies were categorized as suprasegmental-based instruction studies in the current analysis. The remaining four studies targeted both segmental and suprasegmental aspects of L2 (Champagne-Muzar, Schneiderman, & Bourdages, 1993;

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[1] Derwing et al. (1998) included both suprasegmental- and segmental-based instruction (see Table 1).

Lord, 2008) and correct pronunciation forms of specific lexical items (Macdonald, Yule, & Powers, 1994; Neri, Mich, Gerosa, & Giuliani, 2008).

Type of Instruction

First, despite the considerable definitional fuzziness of the classification of types of instruction in the literature, for the purpose of this research two categories were used: focus-on-form (FonF) and focus-on-formS (FonFS). Instruction was coded as FonF when teachers made some kind of effort to draw learners' attention to form not only in controlled contexts (i.e., when practicing form is the only task) but also in communicative contexts (i.e., when practicing pronunciation form while being involved in meaning-oriented communicative activities). In this respect, the definition of FonF in the current study is similar to the inclusive definition of FonF by Doughty and Williams (1998).[2]

Several attempts have been made to guide learners to analyze the target features with some degree of elaboration. In Lord's (2008) study, students worked together in small groups to create their own podcast channel about some meaningful topics and provide peer feedback to each other especially in regard to their use of pronunciation features based on what they had learned in Spanish phonetics class (see also Abe, 2011, for similar activities). Saito and Lyster (2012) created a number of tasks where Japanese students were guided to pay attention to the accurate pronunciation of English /ɹ/ while learning English argumentative skills via debate and public speaking activities (i.e., proactive FonF). During those tasks, teachers also consistently provided recasts in response to students' mispronunciation of /ɹ/ (i.e., reactive FonF). Six studies were categorized as FonF.

Second, instruction was coded as FonFS when teachers provided only controlled activities where students were asked to practice pronunciation via mechanical drills and choral repetition without much elaboration (their goal was to exclusively practice the accurate use of pronunciation form). Ten studies were categorized as FonFS.[3]

Finally, in order to compare overall effectiveness of pronunciation instruction (FonF and FonFS) with simple exposure to meaning-oriented

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[2] According to Doughty and Williams (1998), "the fundamental assumption of focus-on-form instruction is that meaning and use must already be evident to the learner at the time that attention is drawn to the linguistic apparatus needed to get the meaning across" (p. 4). However, other researchers such as Ellis and Long proposed slightly different notions of FonF with respect to explicitness of form-focused instruction (for further discussion, see Ellis, 2006).

[3] Again, this definition of focus on formS closely follows the notion of formS by Doughty and Williams (1998) which involves "isolation or extraction of linguistic features from context or from communicative activity" (p. 3).

lessons, the current study identified nine studies which included control groups where students were engaged in communicative learning tasks without any overt focus on pronunciation form. These studies were coded as focus-on-meaning instruction (FonM).

Type of Outcome Measures

Drawing on concepts proposed by Spada and Tomita (2010), outcome measures were categorized as either (a) controlled constructed responses (CR) (14 studies) or (b) free constructed responses (FR) (5 studies).[4]

Controlled constructed responses included word-reading tasks (e.g., Cardoso, 2011), sentence-reading tasks (e.g., Kennedy & Trofimovich, 2010), and paragraph-reading tasks (e.g., Lord, 2005, 2008). Free constructed responses included picture description tasks (e.g., Derwing et al., 1998; Saito & Lyster, 2012) and delivery of short lectures on a prepared topic (Macdonald et al., 1994). The summary of the 15 studies is presented in Table 1.

RESULTS

Effects of Instruction

All intervention studies demonstrated significant improvement resulting from instruction except two studies, arguably because students in their studies received only 15 to 30 min of instruction (Macdonald et al., 1994) or attained almost perfect scores at pre-tests without much room for further improvement (Saalfeld, 2011). No improvement was found in FonM treatment (i.e., control groups) where students were exposed to meaning-oriented lessons for durations ranging from a few hours to one semester in length.

Focus of Instruction

For segmental-based instruction, all five studies demonstrated improvement at a controlled level. However, only one of these five studies showed improvement at a spontaneous level (i.e., Saito & Lyster, 2012). For suprasegmental-based instruction, all seven studies demonstrated improvement at a controlled level. Only Derwing et al.'s (1998) study included measurement at a spontaneous level, and it found improvement.

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[4] Four studies included both CR and FR (see Table 1).

TABLE 1
Overview of 15 Selected Studies

	Participants	Target forms	Instructional type	Length	Test types
Champagne-Muzar et al. (1993)	34 FSL learners 5 NS listeners	Segmentals and suprasegmentals in French	FonFS, FonM	1 semester	CR
Macdonald et al. (1994)	23 ESL learners 120 NS listeners	10 key vocabulary items in English	FonFS, FonM	10–30 min	FR
Elliott (1997)	66 English learners of Spanish 4 near-native NNS listeners	19 allophones in Spanish	FonFS, FonM	1 semester	CR, FR
Derwing et al. (1997)	13 ESL learners 37 NS listeners	Suprasegmentals in English	FonF	12 weeks	CR
Derwing et al. (1998)	48 ESL learners 48 naïve NS listeners 6 experienced NS listeners	Segmentals and suprasegmentals in English	FonF, FonM	11 weeks	CR, FR
Lord (2005)	17 English learners of Spanish	Spanish voiceless stops	FonFS	1 semester	CR
Couper (2006)	71 ESL students	Syllable structures in English	FonFS, FonM	11 weeks	CR
Neri et al. (2006)	28 Italian learners of English 3 NS experienced listeners	28 target words in English	FonFS	120 min	CR
Lord (2008)	16 English learners of Spanish	Segmentals and suprasegmentals in Spanish	FonF	1 semester	CR
Kennedy & Trofimovich (2010)	10 ESL learners 10 NS listeners	Suprasegmentals in English	FonF	1 semester	CR
Abe (2011)	60 Japanese learners of English	English weak forms	FonF, FonFS	4 hr	CR
Cardoso (2011)	30 Portuguese learners	Syllable structures in Slavir	FonFS	90 min	CR
Saalfeld (2011)	28 English learners of Spanish	Lexical stress	FonFS, FonM	1 semester	CR
Saito (2011)	20 Japanese learners of English 4 NS experienced listeners	8 segmentals in English	FonFS, FonM	4 hr	CR, FR
Saito & Lyster (2012)	64 Japanese learners of English 5 NS listeners	English /ɹ/	FonF, FonM	4 hr	CR, FR

Note. FonF, focus-on-form; FonFS, focus-on-formS; FonM, focus-on-meaning; CR, controlled constructed responses; FR, free constructed responses.

Type of Instruction

For FonF instruction, all six studies showed improvement at a controlled level, and two out of these studies measured and showed improvement at a spontaneous level (i.e., Derwing et al., 1998; Saito & Lyster, 2012). For FonFS instruction, whereas eight studies measured and showed improvement at a controlled level, three studies included measurement at a spontaneous level but all failed to show improvement (i.e., Macdonald et al., 1994; Elliott, 1997; Saito, 2011).

Type of Outcome Measures

Whereas all 13 studies that adopted controlled constructed responses demonstrated improvement, only two out of five studies that adopted free constructed responses demonstrated improvement (i.e., Derwing et al., 1998; Saito & Lyster, 2012). Note that these two studies provided FonF instruction. The results of the significant instructional gain are summarized in Table 2.

DISCUSSION AND CONCLUSION

While some teachers and researchers remain doubtful about the pedagogical capabilities of pronunciation teaching, likely due both to

TABLE 2

Summary of Significant Instructional Gain

	Instruction	Tests	Gain		Instruction	Tests	Gain
Champagne-Muzar et al. (1993)	FonFS	CR	○	Neri et al. (2006)	FonFS	CR	○
	FonM	CR	×	Lord (2008)	FonF	CR	○
Macdonald et al. (1994)	FonFS	FR	×	Kennedy & Trofimovich (2010)	FonF	CR	○
	FonM	FR	×				
Elliott (1997)	FonFS	CR	○	Abe (2011)	FonF	CR	○
		FR	×		FonFS	CR	○
	FonM	CR	×	Cardoso (2011)	FonFS	CR	○
		FR	×	Saalfeld (2011)	FonFS	CR	×
Derwing et al. (1997)	FonF	CR	○		FonM	CR	×
Derwing et al. (1998)	FonF	CR	○	Saito (2011)	FonFS	CR	○
		FR	○			FR	×
	FonM	CR	×		FonM	CR	×
		FR	×			FR	×
Lord (2005)	FonFS	CR	○	Saito & Lyster (2012)	FonF	CR	○
Couper (2006)	FonFS	CR	○			FR	○
	FonM	CR	×		FonM	CR	×
						FR	×

Note. ○ stands for statistically significant improvements resulting from instruction; × stands for the lack of any significant instructional gain.

the limited amount of research and the lack of adequate teacher training (Derwing & Munro, 2005), the current study was a first attempt at conducting a research synthesis of 15 quasi-experimental studies which investigated effects of instruction on L2 pronunciation development. The results showed that instruction is effective not only for improving specific segmental and suprasegmental aspects of L2 sounds (e.g., Cardoso, 2011; Couper, 2006; Elliott, 1997; Saito, 2011) but also for enhancing listeners' overall judgement of comprehensibility (e.g., Derwing et al., 1997, 1998; Kennedy & Trofimovich, 2010; Lord, 2008). However, it needs to be emphasized that two studies did not demonstrate clear improvement, arguably because of the brevity of instruction (Macdonald et al., 1994) and ceiling effects of learners' initial pronunciation proficiency (Saalfeld, 2011).

Another important point to address here is that the primary studies were designed to lead learners to reach the threshold required for intelligibility rather than to eliminate their accents. For example, Derwing et al. (1997, 1998) and Kennedy and Trofimovich (2010) showed that pronunciation instruction delivered over one semester can enhance the overall comprehensibility of students' L2 utterances (i.e., how easy it is to understand what they say) instead of reducing their degree of foreign accentedness (i.e., phonological nativelikeness of utterances). With respect to specific cases of suprasegmentals, Couper (2006) found that those who received focused instruction on English syllable structures significantly reduced the error rate of addition of epenthesis vowels and absence of final consonants from 20% to 5%, although none of them reached nativelike proficiency levels.

The second research question asked if instructional effectiveness varies according to focus of instruction, type of instruction, and type of outcome measure. As for focus of instruction, although much discussion has been centered on the issue of whether segmental- or suprasegmental-based instruction is more effective than the other (Levis, 2005),[5] the results of the current study did not find any clear patterns; students receiving both types of instruction improved their L2 pronunciation performance. Although Derwing et al. (1998) found that students who received segmental- and suprasegmental-based instruction demonstrated different types of improvement (only the latter group demonstrated gain in their spontaneous speech abilities), they emphasized the importance of adopting both types of instruction in order to improve students' overall performance in various situations.

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[5] In his review, Levis (2005) commented, "During the past 25 years, pronunciation teachers have emphasized suprasegmentals rather than segmentals in promoting intelligibility . . . despite a paucity of research evidence for this belief" (p. 369).

Recent L2 pronunciation research has begun to show that not all pronunciation features are equally important for perceived intelligibility, identifying a range of segmental and suprasegmental pronunciation features affecting listeners' successful comprehension. These features comprise not only suprasegmental features such as lexical stress (Field, 2005), sentence stress (Hahn, 2004), but also segmental features such as segmental contrasts with high functional load (Munro & Derwing, 2006) and lingua franca cores (Jenkins, 2000). Therefore, teachers should carefully select target features for their own students according to their proficiency levels, ultimate goals, and L1 backgrounds instead of preoccupying themselves with the debate on the competing merit of segmental- vs. suprasegmental-focused instruction.

Importantly, the results revealed that type of instruction can be a relatively important variable, especially in terms of instructional effectiveness on students' pronunciation performance at different processing levels. Whereas FonFS tends to lead to improvement only at a controlled level (e.g., Elliott, 1997; Saito, 2011), FonF enables learners to achieve improvement both at a controlled and spontaneous levels (Derwing et al., 1998; Saito & Lyster, 2012). Furthermore, Abe (2011) found that the instructional effectiveness of these two methods could result with a difference in amount as well as durability in the context of the acquisition of English weak forms by Japanese EFL students. Whereas the FonFS group demonstrated small improvement only at the immediate posttests, the FonF group not only showed a large amount of improvement resulting from instruction but also maintained its gain even after one month.

According to relevant L2 literature, the relative effectiveness of FonF over FonFS can be attributed to several factors. First, integrating language focus into meaning-oriented classrooms (FonF) is hypothesized to help students establish form-meaning mappings (VanPatten, 2004) as well as to promote proceduralization of their declarative knowledge (Lyster, 2007). In L2 phonology, Trofimovich and Gatbonton (2006) suggest that preplanned form-focused activities that occur during genuinely communicative L2 interaction could be considered as contextualized repetitive practice, resulting in impacts not only on accuracy but also on fluency. In contrast, instruction with focus exclusively on forms (FonFS) does not allow students to transfer what they learn in classroom to outside of the classroom.

Interestingly, however, L2 grammar studies have revealed that FonF consists of a range of instructional options which include (a) focused tasks (i.e., communicative activities which are designed to create many obligatory contexts and elicit learners' use of a specific linguistic feature in comprehension and production; VanPatten, 2004), (b)

corrective feedback (i.e., provision of corrective feedback in response to students' linguistic errors; Lyster, 2007), and (c) explicit instruction (i.e., provision of metalinguistic information before FonF lessons; Spada & Lightbown, 2008). Although six of the primary studies in the current study adopted meaning-oriented activities, they do not take into account which of the above options were used. Future studies of this kind need to tease apart and compare these FonF instructional options in order to assess which combination can be most effective and efficient to lead to large gains in the context of L2 pronunciation development.

Another promising direction for future type-of-instruction studies is to test the potential impact of developmental sequences (i.e., whether the syllabus starts from easy/less marked to difficult/more marked features or vice versa). Cardoso (2011) examined the relative effectiveness of three types of instruction—(a) teaching only difficult features, (b) teaching from easy to difficult features, and (c) teaching all items equally—on the production of /s/ + consonant onset clusters in an artificial language, Slavir. The results showed that the group that focused only on the most difficult instance (/st/) transferred the gain to the easier contexts (/sn/ and /sl/) and outperformed the other two groups. For theoretical and pedagogical implications, this topic needs to be further explored with different pronunciation targets and populations of students.

The process of carrying out the review revealed some methodological questions especially in regard to the way free constructed responses were operationalized in the primary studies. First, it still remains unclear to what degree the primary studies actually measured the impact of pronunciation instruction on students' L2 pronunciation performance at a spontaneous level. While four studies (Derwing et al., 1997, 1998; Elliott, 1997; Saito, 2011) asked listeners to rate the learners' spontaneous speech tokens, other L2 pronunciation research has shown that not only pronunciation-related features but also lexical, grammatical, and pragmatic aspects of language interact to determine listeners' overall judgment (Isaacs & Trofimovich, 2012). Of course, the ultimate goal of L2 instruction is to lead students to attain comprehensible speech and enhance their interlocutors' successful comprehension. However, the primary studies adopting only the human rating method did not isolate the effects of pronunciation instruction only on pronunciation development independently of its impact on other domains of language (see also Couper, 2006, for similar discussion).

The second issue is raised by Saito and Lyster (2012). They aimed at measuring how instruction helped students produce English /ɹ/ in a extemporaneous manner via a picture description task (i.e., each picture had three word prompts which pushed learners to use one target word including English /ɹ/ in order to create narratives), However,

they pointed out the difficulties of measuring specific pronunciation features embedded in a communicative speech, arguably because the realization of these individual sound features can be significantly influenced by the preceding and following phonetic contexts (e.g., prevocalic vs. postvocalic /ɹ/). Not surprisingly, L2 phonology research has exclusively depended on word and sentence reading tasks whereby learners could fully focus on target features and carefully monitor their pronunciation under no communicative pressure (see Piske, MacKay, & Flege, 2001 for a comprehensive review of elicitation methodologies in L2 phonology research). To this end, further research is needed to develop more valid outcome measures to investigate the extemporaneous use of certain pronunciation features, which will in turn allow future intervention studies to measure instructional gains on students' spontaneous production abilities and communicative competence.

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Kazuya Saito is assistant professor at Waseda University in Tokyo, Japan. His research examines how a communicative focus on form can help EFL students develop their comprehensive listening abilities as well as intelligible pronunciation skills for the purpose of successful communication in an efficient and effective manner.

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