



Learner Pronunciation, Awareness, and Instruction in French as a Second Language

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Abstract: This study examined the speech of 30 adult learners of French as a second language (L2) in a 15-week listening/speaking course, investigating the relationship between learners' pronunciation development and their pronunciation awareness, measured through learners' conceptions of learning. The course targeted segmental and suprasegmental aspects, including connected speech processes (*enchaînement*, *liaison*), intonation, and fluency. Learners wrote weekly journals eliciting measures of pronunciation awareness and completed read-aloud and picture description tasks at the course's beginning and end. Speech was analyzed through seven measures, including fluency and segmental and suprasegmental accuracy. Results showed significant improvements in learners' segmental production, *enchaînement*, and some aspects of intonation and fluency. Several variables were associated with pronunciation awareness measures. Results are discussed in light of L2 pronunciation development and instruction-awareness links.

Key words: *connected speech processes, French as a second language, instruction, language awareness, pronunciation*

Introduction

A recent review of research on the effects of second language (L2) pronunciation instruction reported a noticeable increase in published research between 1990 and

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2012 (Saito, 2012). Although pronunciation can no longer be characterized as suffering from “the ‘Cinderella syndrome’—kept behind doors and out of sight” (Celce-Murcia, Brinton, & Goodwin, 1996, p. 323), many questions remain, especially for learners of languages other than English. Two of these questions concern how the development of learners’ L2 pronunciation is linked to pronunciation instruction specifically and to learners’ awareness of pronunciation patterns in general. In the study reported here, *L2 pronunciation* refers to learners’ performance on perception or production tests targeting individual segments, such as vowels and consonants, as well as suprasegmentals, such as linking, stress, rhythm, and intonation. In turn, *pronunciation awareness*, which is discussed in detail below, denotes learners’ conceptions of how pronunciation is acquired and how pronunciation patterns help speakers convey intended meanings in the L2.

Many textbooks for French as an L2 target phonology and pronunciation, yet very little is actually known about the development of French pronunciation in instructed learners, so instructors and learners rely on intuition, course materials, and past experience to guide their teaching and learning activities. In addition, previous research on French language awareness has focused primarily on phonological awareness for young readers (e.g., Fleuret & Montesinos-Gelet, 2011) or on the relationship between pedagogical activities and learners’ awareness of grammatical and lexical forms (e.g., Erlam, 2003). The current study, therefore, investigated the pronunciation development of adult learners of French as an L2 at the beginning and end of a one-semester listening and speaking course and particularly explored learners’ conceptions of French pronunciation both as a linguistic system and as a learning challenge. The overall goal was to contribute to the knowledge base about how L2 French learners’ pronunciation development is linked to pronunciation instruction and learners’ pronunciation awareness.

Literature Review

Research on the teaching of pronunciation in L2 settings has largely focused on two areas: exploring the effectiveness of different instructional approaches, and identifying the role that language awareness plays in learning pronunciation. An example from the first area is a method-comparison study by Derwing, Munro, and Wiebe (1998). These researchers investigated the effectiveness of instruction targeting suprasegmentals and general speaking habits for a group of English as an L2 learners, with the instruction targeting fluency phenomena, intonation, rhythm, and word stress. This type of instruction was compared to a more traditional training focusing on individual segments or sounds. After a 12-week course, while both groups improved in terms of production of individual sentences, only the suprasegmental group showed progress in extemporaneous speaking. An example of research targeting language awareness in pronunciation comes from Couper (2011), who showed that pairing intensive listening practice with an approach allowing the instructor and the learners to develop a mutually agreed-upon set of metalinguistic descriptors for discussing pronunciation resulted in the best performance, compared to other approaches, in both perception and production. Both these lines of research have demonstrated that attention to pronunciation through explicit instruction is beneficial (as shown by Derwing et al., 1998), especially when learners are made aware of how L2 pronunciation works, for example, through metalanguage (as suggested by Couper, 2011). The following literature review discusses both of these lines of research in detail, with a particular focus on the learning of L2 French pronunciation.

Teaching of Pronunciation in L2 French

As mentioned earlier, there is currently a dearth of knowledge about L2 French learners’ development of pronunciation in

instructional settings and no information about their awareness of pronunciation. Existing studies on L2 French pronunciation have typically used one-time measurements of learner speech, focusing on learner proficiency (Birdsong, 2003) or different contexts of learning/use (Thomas, 2002). For example, Birdsong showed that out of 22 post-adolescent advanced learners, only two demonstrated pronunciation that was similar to native French speakers' at segmental and suprasegmental levels. While interesting, however, these findings have little to say about the development of pronunciation over time.

The few longitudinal studies on the learning of French pronunciation have been set in university contexts. For example, Harnois-Delpiano, Cavalla, and Chevrot (2012) tracked the use of liaison (as in *mes amis* [my friends], spoken as [mɛ-zami]) over one year by second-year learners in a weekly three-hour French language and literature course at a Korean university. The learners showed significant increases in their production of obligatory and optional liaison in word pairs over this 12-month period. However, because the instruction given to the learners in this foreign language context was not described in sufficient detail, attributing learning gains to the quality or quantity of instruction is problematic.

The effects of training aimed specifically at the pronunciation of French learners were also explored in research at a French-English bilingual university in Canada (Champagne-Muzar, Schneiderman, & Bourdages, 1993). The learners, enrolled in a beginner-level French as an L2 course, completed an hour of listening and pronunciation exercises for 12 weeks, presented on cassette tapes in a language lab. The exercises targeted French intonation, rhythm, and segments. As part of instruction, the learners completed active listening tasks such as discriminating between sounds, rhythmic groups, and intonation patterns; they also repeated or transformed model utterances. Before and after training, the learners were tested in an elicited imitation

task with sentences containing various intonation contours and rhythmic patterns. Native French speakers then rated these recordings on four 5-point scales for segments, intonation, rhythm, and global impression. The scores of the trained learners and the comparison group, who completed listening comprehension exercises without pronunciation practice, were not significantly different for any pretest ratings. However, the posttest ratings of the trained learners were significantly more native-like on all four scales than their pretest ratings. For the comparison group, only segment ratings significantly improved from the pretest to posttest. In another university study, Knoerr (2000) tracked French learners in a semester-long pronunciation course. The learners used a computer program displaying intonation curves of model utterances and their own utterances for at least 15 minutes a week for six consecutive weeks. Results showed improved performance in almost all of the 10 types of intonation contours practiced. However, the results were not subjected to significance testing.

Learner Awareness

At least one way to interpret the positive effects of explicit instruction on pronunciation development, especially in light of findings reported by Couper (2011), is to posit a link between explicit instruction and enhanced learner awareness. Although language awareness is a broad and multifaceted construct, some aspects of this phenomenon refer to being aware of "the way language works to convey meaning" (Hawkins, 1984, p. 5) and also to an understanding of "how language is acquired" (Tulasiewicz, 2000, p. 10). Both aspects of language awareness, so defined, are compatible with Couper's conception of pronunciation training as meaningful practice in a communicative context (Achard & Niemeier, 2004; Fraser, 2010).

Research investigating links between instruction and learner awareness of spoken language has mainly focused on the effectiveness of a metacognitive approach to L2

listening instruction (e.g., Vandergrift & Goh, 2012). This approach involves raising learners' awareness of the listening processes and focuses their attention on the use of metacognitive strategies, including predicting listening content, monitoring comprehension, and evaluating success in understanding. Generally, this line of research has revealed positive effects of metacognitive awareness-raising in L2 listening, compared to alternative instruction (Graham & Macaro, 2008; Vandergrift & Tafaghodtari, 2010; but see Thompson & Rubin, 1996).

However, with respect to L2 pronunciation, investigations of instruction-awareness links have been uncommon. Among the few exceptions are studies by Ramírez Verdugo (2006), who measured learners' awareness of English intonation patterns by Spanish learners following instruction; Moore (1997), who targeted Japanese learners' pronunciation awareness in a speaking course; and Kennedy and Trofimovich (2010), who investigated learners' awareness of English pronunciation in a university-level ESL speaking course. Ramírez Verdugo (2006), for example, used a multisensory approach, including metalinguistic information, oral models, and phonetics software with visual display, to raise learners' awareness of intonation contours in English. Learners receiving this treatment showed significantly better posttest performance than a control group in the range of contours used and in ratings of their spontaneous speech. In anonymous post-instruction questionnaires, the treatment group also reported increased awareness of English intonation. Thus, there appears to be some evidence that explicit instruction in pronunciation is not only associated with measurable pronunciation gains, but is also linked to increased learner awareness of targeted pronunciation patterns in an L2.

Research Objectives

Taken together, the studies of French pronunciation thus far have provided limited

evidence of links between instruction and improvement in learners' pronunciation. Of the studies cited above, only one included both a description of the instruction and significance testing for pretest and posttest measurements (Champagne-Muzar et al., 1993), and no study examined how learners' awareness of French pronunciation was related to their production in several speaking tasks. The current study investigated both of these issues, addressing the following two research questions:

1. How does L2 French learners' pronunciation in two different speaking tasks develop following focused pronunciation instruction?
2. How is L2 French learners' post-instruction pronunciation related to their pronunciation awareness?

Method

Participants

The participants were 30 learners of French as an L2 (23 women, 7 men) who were enrolled in an intermediate-level listening and speaking course at a French-language university in Quebec, Canada, and at least one other French course. None had received elementary or secondary schooling in French. The learners, whose mean age was 35.8 years (age range: 27–52) and who had resided in Quebec for a mean of 3.2 years (0.3–10 years), spoke several different native languages, including Mandarin (11); Russian (7); Farsi (3); Spanish, Portuguese, and Cantonese (2 each); and Korean, Malay, and Romanian (1 each).

Instruction

The 15-week listening and speaking course met once per week for three hours, with about one hour devoted to practice in a multimedia lab. The chief aim of the course was to improve learners' L2 oral production and listening skills. The instructor was a

native speaker of Quebec French with a graduate degree in applied linguistics and 10 years of L2 French teaching experience. The integrated form-focused instruction targeted segmental and suprasegmental aspects of spoken French. However, the main focus was on connected speech processes, with a lesser focus on developing speech fluency and prosody. In teaching connected speech processes, the emphasis was predominantly on learner comprehension of spoken language featuring *enchaînement* and liaison, but the learners were also encouraged to produce *enchaînement* and obligatory liaison in practice tasks.¹ In terms of fluency and prosody, the emphasis was on fluid delivery of speech, achieved through work on phrasal stress (rhythmic grouping) and intonation, with practice involving both controlled output recorded in the lab and guided practice (e.g., expressive readings, rehearsals for a scene from a play). Students worked in small groups, annotating their text, practicing out loud, and helping one another. The instructor and a teaching assistant provided regular oral feedback on both comprehension and production exercises, in class as well as in the lab. Individualized written feedback, in the form of text annotation of errors, was also given for recorded productions at regular intervals.

In a typical pedagogic sequence, a topic (such as *chute du 'e'* or schwa deletion) was covered in one class meeting and reviewed during the following class. Each meeting typically started with a discovery activity, followed by the instructor's explanation of that particular aspect or process, then followed by listening exercises, such as dictation of a cloze dialogue. The learners then practiced the targeted aspect or process using communicative activities such as role-plays, and fluency tasks (e.g., shadowing). Lab-based multimedia materials involved short sentences exemplifying the targeted speech aspects, with learners using these materials to complete dictation or production tasks. Lab work was assigned by the instructor, and all students completed the same tasks.

Tasks

Learner speech data were gathered using a read-aloud task and a picture description task. Students completed each of these tasks twice, in Week 3 as a pretest and in Week 15 as a posttest, using the same equipment, instructions, and procedures by recording their speech in a multimedia lab using the CAN-8 Virtual Lab (CAN, 1990) interactive software. At both testing times, the read-aloud task always preceded the picture description task, and both tasks were administered after a battery of perception tests used for a different study (Kennedy & Blanchet, in press). Pronunciation awareness data were collected using a dialogue journal task with learners completing journal entries in Weeks 3–15 of the course, and learners' exposure to French outside the class was tracked using language logs throughout the term.

Read-Aloud Task

This task was a 163-word story that involved an exchange between a woman standing in a ticket line and a man who wanted to cut into the line. The dialogue between the two characters (five turns, nine sentences) was preceded and followed by a three-sentence narrative. The sentences were 10–15 words long ($M_{length} = 11$ words), and 90% of all vocabulary was among the first 1,000 most frequently used words in French (Cobb, 2000), suggesting that the text presented little lexical challenge for the learners and was suitable for eliciting the speech phenomena targeted in this study. For the read-aloud task, the learners received a copy of the text and had a two-minute period to review the text and prepare for the reading. The recording screen was then initiated on each personal computer from the instructor's console, and the learners had 150 seconds to record the text.

Oral Picture Description Task

This task, which was based on an eight-panel image sequence, featured two people who bumped into each other on a crowded street corner, accidentally exchanged their

identical suitcases, but realized their mistake only later (Derwing, Munro, & Thomson, 2008). The learners received a copy of the picture story, entitled *Erreur sur la valise* [*Suitcase Mix-Up*] and had two minutes to look over the images and prepare the story; note-taking was not permitted. The recording screen was then initiated, and they had five minutes to record their narrative.²

Journal Task

For this task, each learner was paired with a partner in Week 3 of instruction, after which both partners began exchanging written entries. The learners were asked to reflect on their learning by making links between their learning inside the classroom and their experience with authentic French use outside the class. The learners, who wrote in French, exchanged their entries and responded to their partner's entries on a weekly basis through the Moodle (2011) course management platform for a duration of 12 weeks. Altogether, each learner completed a mean of nine entries per term (3–12 entries), with an average of 174 words per entry. Of the 30 learners, half produced more than 10 journal entries. Journal entries were not read by the instructor or by researchers until the course grades had been submitted.

Language Log Task

The learners kept a weekly language log throughout the term for self-reported use of French. This involved estimates of the time spent using French in different domains inside and outside of class, such as during social interaction, leisure, and work activities. To derive a measure of French use outside of class, the total number of hours spent using language in all reported domains was summed for each student and then divided by the total number of language use logs completed by each student during the term (4–12 logs, with a mean of 10 logs over 12 weeks), in order to correct for unequal number of logs submitted. On average, learners reported their weekly out-of-class use of French at a mean 18.2 hours (3.8–80.6 hours) during the term.

Speech Measures

All pretest and posttest recordings from both tasks were transcribed and verified by trained research assistants. The audio recordings of both tasks, considered along with the transcripts, were then analyzed for seven measures reflecting the course aims and content. The measures, which spanned the domains of segmental and suprasegmental phonology as well as fluency, included the following:

1. Segmental errors: defined as individual segment additions, deletions, or substitutions (e.g., *tu* [you] spoken as *tout* [all]), as well as spelling-based mistakes (e.g., *coup* [hit] spoken as *coupe* [cut]). Following Trofimovich, Lightbown, Halter, and Song (2009), only one segmental error per word was tallied, even if multiple errors were present. This allowed for better control of extreme cases of variability in learner error counts, resulting in a conservative accuracy measure. The final measure, calculated per learner separately in each task, was a ratio of the total number of segmental errors over the total number of words produced.
2. The use of *enchaînement*: defined as a successful consonant-to-vowel or vowel-to-vowel link (e.g., *il a* [he has] becomes [i-la] and *tu as* [you have] becomes [ty~a]). To be considered as a successfully implemented link, *enchaînement* had to feature an expected rise-fall pattern signaling a word boundary (i.e., *il↑va~a↓ller* [he will go]) and had to involve a continued, unbroken phonation (absence of perceptible pausing). This measure was computed as a ratio of the total number of successfully produced *enchaînements* over the total number of contexts where such links could potentially occur. These latter counts were specific to each learner's output in the picture description task but were fixed in the read-aloud task. Potential contexts for *enchaînement* had been both discussed and practiced in read-aloud tasks during

the course, with the instructor encouraging learners to produce *enchaînement* across increasingly longer phrases.

3. The use of liaison: defined as an obligatory realization of liaison between two adjacent words (e.g., between personal pronouns and verbs and between determiners and nouns). To be considered as a liaison, the use had to involve a proper grammatical context (e.g., *nous avons* [we have, nu-za-vɔ̃]), an appropriate phonetic realization of the linked consonant (e.g., [d] produced as [t] as in *grand homme* [tall man, grɑ̃-tɔ̃m]), and, as with *enchaînement*, an expected rise-fall pattern signaling a word boundary, with no perceptible pausing between words. Again, this measure was calculated as a ratio of the total number of successfully realized obligatory liaisons out of the total number of contexts for obligatory liaison in each learner's production, which varied in picture description but was fixed in the read-aloud task. Both the *enchaînement* and liaison measures targeted learners' production of connected speech.
4. Intonation errors: defined as inappropriate pitch moves produced by the learner, which included a rising or flat contour to signal closure as well as a falling or flat contour where a signal of continuity would be expected (e.g. *Chacun son tour, monsieur!* [Wait your turn, sir!] where *tour* is mistakenly spoken with a falling pitch). This measure was expressed as a ratio of the total number of inappropriate intonation contours produced over the total number of expected contours. This latter count was specific to each learner in the picture description task, as the number of expected intonation contours depended on each speaker's phrasing but was fixed in the reading.
5. Pitch range, as a measure of pitch breadth: defined as the difference between the highest and lowest fundamental frequency (F0) values, extracted from a pitch tracker display (Boersma & Weenink, 2010). This measure captured

the degree of pitch range for each learner in absolute terms, on the assumption that narrower pitch ranges were associated with flat and monotonous delivery while wider pitch ranges defined lively and animated speech (see Wennerstrom, 2001). Both the intonation and pitch range measures targeted learners' production of prosody.

6. Mean length of run (MLR), as a measure of fluency: computed as the mean number of syllables produced between two adjacent filled or unfilled pauses of 400 milliseconds or longer, following Riggensbach (1991).
7. Finally, speech hesitations included all cases of dysfluencies, as perceived by a listener, involving filled and unfilled pauses (e.g., *ils vont ... euh ... au travail* [they are going ... hmm ... to work], where "..." designates a filled pause) and pauses inside a rhythmic group (e.g., *il y a un ... panneau* [there is a ... sign]). To normalize for varying speech length across learners and tasks, this measure was expressed as a ratio of the total number of hesitations over the total duration of each speech sample, which corresponded to the frequency of hesitations per second of speaking time. The MLR and speech hesitation measures targeted learners' fluency.

All measures were coded by native French speakers trained by the second author. This researcher first coded 10% of all data together with the two research assistants, then another 5% after a week of independent coding by the research assistants to clarify any questions. The research assistants coded the remaining data independently; they consulted with each other, with each responsible for one task, and they were instructed to judge learner output using their native speaker intuition and phonetic knowledge (e.g., in deciding the accuracy of intonation contours). The second author recoded 10% of the data from the picture description task, where the likelihood for inconsistent judgments was arguably greater

than in the read-aloud task. Intercoder agreement ranged from 98 to 100% for all speech measures in the picture description task.

Measures of Awareness

Measures of pronunciation awareness were derived from Benson and Lor (1999), who categorized learners' conceptions of learning as qualitative or quantitative. In this framework, qualitative awareness is shown when learners depict language as an environment for learning (e.g., using French to order a coffee as well as to practice pronunciation) and when learning is expressed as a way of extracting meaning from a given context (e.g., applying knowledge of liaison in order to understand a public announcement in French). Quantitative awareness is shown when learners describe language as a set of items to be memorized (i.e., different phonological environments for *enchaînement*) or when they portray learning as a process of internalizing items or rules through effort, practice, and time. This framework was applied to learners' awareness of the French sound system and of how French pronunciation can be taught and learned. Journal entries could include comments showing quantitative awareness and those showing qualitative awareness. One complete awareness comment could range from one sentence to one paragraph in length, but all complete comments expressed only one idea or described only one event. The following examples illustrate both kinds of awareness as shown in dialogue journal entries (translated by the second author; all language errors were kept, as in the original version).

Qualitative: *L'histoire était une histoire pour enfants, très facile à comprendre, mais quand j'ai essayé de la raconter, je me suis paralysé.... Immédiatement après de sortir de la classe, je suis allé à la grande bibliothèque pour emprunter une histoire pour enfants. Cette semaine-là, je la lu plusieurs fois à mon enfant.... J'ai trouvé cette activité très intéressante, et je*

pense emprunter une histoire chaque semaine, parce qu'en plus d'apprendre la langue française, je profite le temps pour partager avec mon enfant.

[It was a story for children, very easy to understand, but when I tried to tell it, I froze.... Right after class, I went to the central library to borrow a story for children. This week I read the story many times to my child. I found this activity very interesting, and I plan to borrow a story each week, because not only do I learn French doing this, I also get to spend time with my child.]

Quantitative: *Dans cette semaine, je vais prendre [l'examen] de la mi-session pour les phonétiques. Je dois mémoriser les dialogues pour présenter devant la classe. Aussi, je dois écouter bien pour la prononciation dans l'examen. Quand je fais mes devoirs, je dois chercher la chute du «e» et chercher des liaisons et des enchaînements dans le texte quand j'écoute le dialogue à même temps. Mais c'était un peu difficultés parce que le dialogue était très vite que je dois vérifier.*

[This week, I'll be taking the midterm [exam] for phonetics. I have to memorize the dialogues that I will present in front of the class. Also, I have to listen well for the pronunciation in the exam. When I do my homework, I have to look for schwa deletions, liaisons, and *enchaînements* while listening to the dialogue at the same time, but that's difficult because the dialogue that I have to check goes by very fast.]

In the first entry, the learner showed qualitative awareness; she viewed the experience of using French to read the stories as an opportunity to improve her ability to communicate the story to her child or to any other listener by improving her pronunciation in French. In the second entry, the learner focused on rote memorization of

texts and attention to different features of connected speech, making no mention of how the use of these features might be linked to meaningful speech.³

The first author, who has experience using this framework, trained the second author in coding the journal entries. The two researchers then coded five journal entries separately and reached 100% agreement for both qualitative and quantitative comments. The second author then coded all remaining entries. To control for different numbers of journal entries contributing to the counts, the number of quantitative or qualitative comments per learner was divided by the total number of journal entries submitted, which corresponded to the number of quantitative and qualitative comments per journal entry, respectively.

Analyses

All statistical analyses were carried out using SPSS 20.0, with the alpha level for significance set at 0.05 and eta-squared (η^2) values used as effect sizes, with $\eta^2 = 0.02$ interpreted as a small effect, $\eta^2 = 0.13$ as a medium effect, and $\eta^2 = 0.26$ as a large effect (Cohen, 1988). All correlational analyses

were based on two-tailed Spearman distributions.

Results

The first research question addressed how French learners' pronunciation developed following explicit phonetics instruction as measured by two different tasks. Table 1 summarizes the data for each of the seven speech variables for each task at each testing time.

To determine if there were differences in learner performance across tasks and testing times, a two-way ANOVA was carried out for each of the seven speech variables, with repeated measurements on the factors of task (reading aloud, picture description) and time (pretest, posttest). The results of these analyses are summarized in Table 2, which shows several significant main effects for task and time but no significant interaction effects. The absence of significant interactions indicated that any obtained differences between tasks were statistically comparable at both testing times, and any obtained differences between the pretest and the posttest were statistically similar across both tasks.

TABLE 1

Means and Standard Deviations for All Speech Variables as a Function of Task and Time

Measure	Read-Aloud Task				Picture Description Task			
	Pretest		Posttest		Pretest		Posttest	
	M	SD	M	SD	M	SD	M	SD
Segmental errors	0.28	0.09	0.25	0.09	0.16	0.08	0.13	0.05
Intonation errors	0.09	0.07	0.07	0.08	0.20	0.13	0.13	0.09
<i>Enchaînement</i>	0.30	0.15	0.34	0.20	0.33	0.20	0.39	0.14
Liaison	0.70	0.20	0.74	0.16	0.65	0.33	0.69	0.23
Pitch range	218.45	68.98	233.16	76.06	186.77	65.33	215.93	72.16
MLR	7.11	3.41	6.64	2.50	3.75	1.30	4.20	1.57
Hesitations	0.14	0.08	0.12	0.06	0.26	0.06	0.23	0.06

Note: All values are proportions, except pitch range (Hz), MLR (syllables), and hesitations (frequency per second).

TABLE 2

Results of Two-Way Repeated-Measures ANOVAs for Each Speech Variable

Measure	Task			Time			Task × Time		
	F(1, 29)	p	η^2	F(1, 29)	p	η^2	F(1, 29)	p	η^2
Segmental errors	58.91	0.001	0.59	22.67	0.001	0.03	0.43	—	
Intonation errors	38.91	0.001	0.25	6.80	0.01	0.05	1.59	—	
<i>Enchaînement</i>	1.07	—		3.95	0.05	0.03	0.15	—	
Liaison	0.90	—		1.03	—		0.01	—	
Pitch range	2.64	—		7.13	0.01	0.04	0.96	—	
MLR	31.30	0.001	0.43	0.01	—		2.20	—	
Hesitations	93.78	0.001	0.61	7.70	0.01	0.02	0.01	—	

Note: “—” indicates $p > 0.05$. Effect sizes are shown only for significant F values.

With respect to differences between tasks, the learners were overall more accurate at the segmental level (producing fewer vowel or consonant errors) in the picture description task than in the read-aloud task but were more accurate in intonation (producing fewer intonation errors) and more fluent (in terms of MLR and mean number of hesitations) in the read-aloud task than in the picture description task. These differences involved large effect sizes, which corresponded to approximately 10–15% differences across tasks, implying a clear difference in learner performance by task. With respect to differences between testing times, the learners overall produced fewer segmental and intonation errors, successfully used *enchaînement* more frequently, and spoke with a wider pitch range and fewer hesitations in Week 15 than in Week 3 of the course. These differences all featured small effect sizes, which corresponded to a reduction of approximately 3–7% in error and hesitation rates and a similar increase in use of *enchaînement* and in pitch range across the term.

It is possible that at least some of these pronunciation gains were due to additional, noninstructional variables, such as the amount and type of exposure to French

outside the classroom (e.g., Moyer, 2011). However, a close inspection of the learners’ language use patterns outside the class (collected as part of the language log task) revealed no straightforward relationship between self-reported use of French and pretest/posttest performance. Of the 28 possible associations between the learners’ self-reported measure of French use and the seven speech measures across two tasks and two testing times, not a single association reached significance. Therefore, it is unlikely that noninstructional factors, such as the use of French outside the class, impacted learners’ pronunciation development to a considerable degree. Instead, the learning gains shown here were likely due, for the most part, to the intensive and focused nature of the instruction received by the learners.

The second research question investigated how French learners’ post-instruction performance was related to their pronunciation awareness. To address this question, correlation analyses (Spearman ρ) were carried out between each speech variable on the posttest and measures of qualitative and quantitative awareness, separately for each task. It should be noted that the measures of awareness represented composite scores across all dialogue journals

completed over the course of a 15-week term. Therefore, the assumption here was that if there were links between pronunciation awareness and development, then there would be clear associations between measures of qualitative and quantitative awareness and learners' posttest performance. These analyses, summarized in Table 3, revealed that only a few aspects of speech showed significant and moderate associations with language awareness on the posttest. These associations were found mostly for the read-aloud task.

Generally, qualitative awareness was associated with fewer intonation errors, more frequent use of *enchaînement*, and fewer hesitations in reading aloud. This means that, after instruction, learners who showed more evidence of qualitative awareness tended to produce intonation and *enchaînement* more appropriately and to read aloud more fluently. In contrast, quantitative awareness was associated with more frequent use of *liaison* in picture description and with more hesitations in reading aloud. This means that, after instruction, learners who showed more evidence of quantitative awareness tended to use *liaison* more but also tended to hesitate more. Put simply, there was some evidence of language awareness being associated with

the learners' post-instruction performance, with both qualitative and quantitative awareness linked to increased production of connected speech processes (*enchaînement* and *liaison*). However, awareness measures were associated in different ways with different types of fluency, with qualitative awareness linked to fewer reading dysfluencies while quantitative awareness related to more such dysfluencies.

Discussion

Motivated by the lack of research on the development of pronunciation of L2 learners in classroom settings, the current authors focused on the speech of 30 adult learners of French as an L2 in a 15-week listening and speaking course. The learners' speech was evaluated in two tasks (reading aloud, describing pictures) through seven speech measures. In addition, the learners' dialogue journals were analyzed for instances of qualitative and quantitative language awareness.

Development of Pronunciation in Learners of French as an L2

The first goal of this study was to determine how L2 learners' pronunciation of French

TABLE 3

Spearman Correlations Coefficients (Two-Tailed) Between Measures of Qualitative and Quantitative Awareness and Posttest Scores for All Speech Variables

Measure	Read-Aloud Task		Picture Description Task	
	Qualitative	Quantitative	Qualitative	Quantitative
Segmental errors				
Intonation errors	-0.40*			
<i>Enchaînement</i>	0.56**			
<i>Liaison</i>				0.38*
Pitch range				
MLR				
Hesitations	-0.48**	0.47**		

Note: * $p < 0.05$, ** $p < 0.01$.

developed after focused instruction. When the learners' performance was evaluated in Week 15 of the course, compared to Week 3, they generally produced fewer segmental and intonation errors, produced *enchaînement* more frequently in their speech, increased their pitch range—thus speaking in a less monotonous way—and decreased the number of hesitations. These improvements were similar across both tasks, although each task clearly drew the learners' attention to different aspects of their performance. When describing pictures, the learners produced segments more accurately than they did in the read-aloud task, but conversely, they spoke more fluently and with great prosodic appropriateness in the read-aloud task. The fact that the text for the reading task was provided, whereas the learners had to construct their own narrative for the picture story, may explain the relatively greater fluency in the reading task. The 150-second time limit for the reading task may have also encouraged the learners to complete the text as efficiently as possible, with less attention paid to segmental accuracy. The unscripted picture descriptions, on the other hand, seemed to elicit comparatively more phonetic precision from learners, perhaps because they had more freedom to choose the words they used and may have opted for words with “familiar” pronunciation.

As is clear from the results, the learners showed significant, although modest, improvement in some but not all of the speech measures that were the target of instruction. Although much of the instruction focused on connected speech processes, the main emphasis was on listening and understanding rather than on implementing these processes in production. This highlights how remarkable learners' improvement was in producing *enchaînement*, given that most of their practice was aural rather than oral. The learners' development in *enchaînement* but lack of development in making obligatory liaison may demonstrate the special challenge related to the production of liaison. For learners, producing the latent

sound of a linking consonant, which is phonetically realized only in specific grammatical contexts for liaison, seemed to pose a greater difficulty than linking an already-realized consonant in *enchaînement* contexts. A different study (Kennedy & Blanchet, in press) showed that the same learners significantly improved in their perception accuracy when transcribing utterances with connected speech processes, including *enchaînement* and liaison. This suggests that the learners had made more general improvement in perceiving connected speech processes than in producing them. Increased accuracy of perception before production in L2 pronunciation has been demonstrated by Archibald (1993) and is an element included in several theories of L2 speech learning (e.g., Flege, 1995).

The improvement in segmental accuracy and prosody measures is an encouraging result that may reflect the consistent instructional emphasis on fluency, expressiveness, and intonation as well as the perception and production of segments. This improvement is especially noteworthy given the overall difficulty of detecting any change in pronunciation performance in previous research, even within a span of 12–15 weeks of instruction (e.g., Kennedy & Trofimovich, 2010; Derwing et al., 1998). On the whole, then, the findings of this study extend the results of the few previous longitudinal studies of how learners of French develop their pronunciation (Champagne-Muzar et al., 1993; Knoerr, 2000) and can be interpreted as good news for the instructors and learners involved in pronunciation work.

L2 French Pronunciation and Language Awareness

Another goal of this study was to determine if there were potential links between the learners' speech development and their conceptions of pronunciation either as a system to be internalized (quantitative awareness) or as a way to understand and express meaning through interaction (qualitative awareness). Both kinds of awareness appeared to be linked

to learner speech at the end of the course. For instance, both qualitative and quantitative awareness were associated with the production of *enchaînement* and liaison, two connected speech processes targeted in the course. The learners who were more qualitatively oriented tended to produce more *enchaînement* in reading, while those who were more quantitatively oriented showed a higher incidence of liaison in describing pictures. This difference may relate to the nature of both speech processes in French. Unlike *enchaînement*, obligatory liaison occurs in specific grammatical contexts, such as between pronouns and verbs or between determiners and nouns, so it often involves words with a very high level of frequency (e.g., *ils* [they], *les* [the], *vous* [you], *on* [we, you], *ces* [these]). These “trigger words” for obligatory liaison can be memorized and applied in appropriate contexts. The picture story allowed the learners some control in their choice of words and phrases. Thus, the learners with a more quantitative orientation may have drawn more on trigger words or phrases they had memorized as contexts for obligatory liaison. By contrast, the learners with a qualitative orientation may have prioritized fluid and connected speech, especially in the provided reading text, leading to an increased incidence of *enchaînement* between already-realized segments.

A similar pattern of findings was obtained for one of the fluency measures (hesitations). The learners displaying a qualitative orientation to learning French tended to speak more fluently (with fewer hesitations) in reading aloud. However, the learners who tended to view French in a quantitative way (as a set of rules and patterns to internalize) spoke with more dysfluencies in reading aloud, possibly prioritizing accuracy. This dissociation between measures of awareness and learners’ focus on accuracy vs. fluency represents a novel contribution to pronunciation research. Put simply, awareness can be viewed as a learner’s orientation toward language and language learning, and this orientation may differentiate between learners who are

more likely to make gains in accuracy and those who may tend to progress in fluency. Thus, language awareness may be akin to many individual difference factors, such as working memory, musical ability, or attention control (Isaacs & Trofimovich, 2011; Venkatagiri & Levis, 2007), capable of determining the outcomes of instruction in pronunciation in L2 classrooms. This finding therefore suggests that measures of awareness need to be included in studies of L2 pronunciation learning so that researchers can evaluate learner progress and instructors can tailor instruction to different learners with greater precision.

A possible view of language awareness as an orientation toward learning raises an interesting question of how language awareness is related to instruction. On the one hand, previous research on the development of more accurate pronunciation in L2 classrooms (e.g., Couper, 2011; Ramírez Verdugo, 2006) is consistent with the idea that increased language awareness is a *consequence* of instruction, on the assumption that awareness-raising is one goal of teaching (see Rutherford, 1987; Rutherford & Sharwood Smith, 1985). Alternatively, if language awareness were to be conceptualized as a learner’s orientation toward learning, for example, similar to individual learner differences in field dependence or independence or in analytical vs. holistic learning styles, then language awareness may, in fact, have an *impact* on language learning and its outcomes. It could be, for instance, that qualitatively oriented learners had already been sensitized to the targeted aspects of spoken French prior to the beginning of the course; perhaps these same learners were also more likely to benefit from instruction than those with a quantitative orientation. More plausibly, though, the relationship between awareness and instruction is reciprocal and self-reinforcing, in that learners’ developing awareness or knowledge of language promotes their learning, which in turn leads to learners’ further development of awareness or knowledge of language. These relationships are typical of

many learning situations, including the development of reading in a native language (Stanovich, 1986) and in an L2 (Pulido, 2003), where, for instance, an initial level of vocabulary knowledge would either help or hinder subsequent development in reading.

Implications for Classroom Pronunciation Teaching

The results of this study have several implications for the development and implementation of pronunciation instruction in L2 classrooms. One clear implication is that learners who receive pronunciation instruction that includes a focus on form, integrated with meaning- and fluency-based tasks, can develop more accurate and more fluent pronunciation. The instruction described here involved different kinds of participation patterns (e.g., instructor-fronted, small group collaboration, individual) and different kinds of practice tasks (e.g., dictation, text annotation, reading aloud, role-plays). Learners with different learning styles likely benefited from the variety of tasks and participation patterns, which allowed for different ways of learning the same target aspects of pronunciation. There are numerous pathways to learning pronunciation, many of which do not involve “traditional” analysis or practice of spoken language (see Laroy, 1995, for a holistic approach to learning pronunciation). Therefore, learners may benefit from being exposed to a variety of participation patterns and practice tasks whenever pronunciation is the focus of instruction.

Throughout the course, learners also received systematic feedback on their perception and production from peers, instructors, and teaching assistants. Feedback on learners’ recorded production was periodically provided in written form and was individualized for each learner. This type of feedback can be time-consuming to provide, but it allows learners to relisten to their recordings and, with the instructor’s guidance, identify areas for improvement. In addition, even though many of the practice tasks targeted learners’ perceptual skills, at

the end of the course, learners still improved in their *production* of segmental and supra-segmental aspects of French as well as in the fluency of their speech. This finding suggests that, when learners receive regular, instructor-guided practice in perceiving different features of pronunciation, this practice can help learners use more accurate pronunciation.

One innovative aspect of the instruction featured here was the focus on learner reflection and pronunciation awareness. Learners were regularly asked to reflect on what they had learned about French pronunciation and how it related to their experience with French outside the class. This reflection, in the form of dialogue journals, allowed learners to explore their own understanding of aspects of French pronunciation, using their own wording. Learners also had the chance to assess what effects their learning had on their understanding and production of spoken French in authentic situations. These learners were living in an environment where at least some outside exposure to spoken French was unavoidable. This is not the case for many foreign language learners; however, the widespread growth in digital media now allows many learners to find opportunities to be exposed to spoken language. Reflective tasks such as journals, language use logs, or small-group discussions may encourage learners both to take advantage of these opportunities and to think about what they have learned, or could learn, from both instruction and out-of-class exposure to the language. These tasks may also help instructors identify learners’ orientations to pronunciation awareness and to suggest possible areas for improvement. For example, learners showing a more quantitative orientation may need encouragement to apply their pronunciation knowledge in more fluid and authentic communication.

Limitations and Future Directions

Although the findings of this study point to interesting relationships between measures

of awareness and L2 pronunciation, they clearly need to be explored further in investigations featuring a comparison group of learners undergoing the same or different kinds of instruction, so that effectiveness of instruction can be established. Pronunciation testing should also include a variety of measures, including measures of L2 perception as well as both holistic, listener-based judgments and fine-grained accuracy tallies of L2 production. Such measures should be derived from a variety of tasks, preferably those that feature no repeated content from pretesting to posttesting. Last, it would be important to obtain initial measures of learners' pronunciation awareness before instruction begins, so that the nature of awareness-pronunciation links and their relationship to the kinds of instruction received inside the classroom can be examined with more precision. In this respect, a fruitful agenda for future research would be to explore the precise nature of the possibly self-reinforcing awareness-instruction relationships, as well as to determine the prerequisite level of L2 skill that learners may need to have in order to benefit from the positive awareness-instruction cycle of learning.

Conclusion

The results of this study generally appear encouraging for both researchers and instructors in that findings suggest that L2 pronunciation, despite the inherent difficulty it poses for adult learners (e.g., Abrahamson & Hyltenstam, 2009), is a skill that can be learned in a classroom context. The current findings also suggest that L2 pronunciation learning is linked to learners' conceptions of pronunciation as both a linguistic system and a learning challenge. In her study of the ways in which native Spanish speakers developed more native-like English intonation, Ramírez Verdugo (2006) noted that structured input activities and explicit instruction on intonation helped "learners of English [gain] both intonation awareness and language confi-

dence," thus leading learners to attain "a realistic attitude towards the need for further practice and training in order to advance in their proficiency... [because] they perceive the necessary effort as valuable and worthy" (p. 155). This quote implies that explicit teaching of pronunciation in a language classroom may chiefly appeal to those learners who view language and language learning in a quantitative sense, that is, as a system to be internalized through effort and time. However, if the principal goal of pronunciation instruction is to empower learners to be successful users of the L2 (see Levis, 2005), then some types of pronunciation instruction may be more successful than others at promoting the *qualitative* view of language and language learning, namely, the view of pronunciation as a means to express meaningful ideas through communication. One future challenge for instructors and researchers, therefore, is to identify such qualitatively oriented types of effective pronunciation instruction and to explore their impact on learners' pronunciation development.

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Notes

1. *Enchaînement* refers to a link between a word-final consonant and the initial syllable of the following word (e.g., *il a* "he has" becomes [i-la]) or the link between word-final and word-initial vowels (e.g., *tu as* "you have" becomes [ty~a]). In turn, *liaison* is the surfacing of a word-final silent consonant and its

resyllabification into the initial syllable of the following word (e.g., *mes amis* “my friends” becomes [mɛ-za-mi]).

2. A reviewer suggested that the use of the same picture story task at the beginning and end of a 13-week period may have engendered a practice effect, contributing to higher fluency scores. Although previous research on task repetition has shown practice effects only for periods of up to 10 weeks (Bygate, 2001), the possibility of practice effects should be explored in further research.
3. A reviewer suggested that the interactive nature of the dialogue journal task, with learners sending entries back and forth to their partners, may have allowed pronunciation awareness to be co-constructed. Careful inspection of learners’ dialogue journals showed that almost no entries showed any acknowledgment of their partners’ previous entries that were coded for pronunciation awareness. However, we acknowledge that the content of learners’ journal entries could have been influenced by learners reading the content of their partners’ entries, by the instruction they received, and by their exposure to French outside of class. We chose to code the dialogue journals as individual measures because of the multiple sources that could possibly have influenced a given learner’s entry.

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