

## PHONETICS INSTRUCTION AND THE /u/-/y/ DISTINCTION IN FRENCH AS A FOREIGN LANGUAGE: A PRELIMINARY STUDY

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The distinction between /y/ and /u/ in French, which often proves difficult for native speakers of American English but is important for intelligibility (*rousse* 'redheaded,' n/adj., fem. /*russe* 'Russian,' *poule* 'hen'/*pull* 'pullover sweater') due to its high functional load, has been often studied but not in the context of the effects of classroom phonetics and pronunciation instruction. This study investigates the efficacy of such instruction for learners of L2 French, by comparing progress in the acquisition of the distinction between /u/ and /y/ by university students enrolled in a French phonetics and pronunciation course with a control group of peers not enrolled in phonetics. Learners were recorded at the beginning and end of a semester; tokens of /y/ and /u/ were analyzed using Praat and native speaker ratings and compared to a set of native speaker recordings. Results did not suggest an effect for instruction but support a call for increased early pedagogical intervention in L2 French pronunciation.

### INTRODUCTION

A recent surge in research and professional communications on pronunciation in language teaching has found that pronunciation instruction is beneficial (e.g., Lord, 2005, 2008, 2010; Miller, 2012). Building on this renewed emphasis, the current study investigates the benefits of pronunciation instruction for advanced L1 American English learners of L2 French. In particular, this paper is concerned with the distinction between closed rounded vowels /u/ and /y/ by advanced learners (3<sup>rd</sup> or 4<sup>th</sup> year university students) of French as a foreign language.

Considerable previous research on L2 pronunciation and phonology acquisition has focused on ESL (e.g., Broselow, Chen, & Wang, 1998; Derwing, Munro, & Wiebe 1997; 1998; Couper, 2006; Rossiter, Derwing, Manimtim, & Thomson, 2010; Saito, 2011; Thomson and Isaacs, 2009;). Hannahs (2007) notes that not much work has been done on L2 phonological acquisition in French. A handful of studies have addressed the production of /y/ and /u/ in L2 French (Darcy, Dekydtspotter, Sprouse, Glover, Kaden, McGuire, & Scott, 2012; Flege & Hillenbrand, 1984; Levy & Law, 2010; Simon, Chambless, & Alves, 2010); these studies focused on learners' production as it stood, rather than on the effects of instruction on learners' ability to produce /y/ vs. /u/ in L2 French, as the current study does.

### The /y/ -/ u/ distinction in French

American English (the learners' L1) has only one closed rounded vowel, the back rounded vowel /u/; Flege and Hillenbrand (1984) note that /y/ has no counterpart in English. They also note that the English /u/ is pronounced differently than French /u/; the English /u/ requires the tongue to be farther front than the French one.

The orthography associated with each sound in French ('ou' = /u/; 'u' = /y/) are both associated with /u/ in American English, or in the case of 'ou', also with the mid-high back rounded

vowel /o/. As such, the distinction between front rounded /y/ and back rounded /u/ is difficult for native English speakers to recognize, perceive and produce when learning French, which includes both sounds. Flege and MacKay (2004) note that vowels are harder than consonants to perceive in an L2. For the /u/ –/y/ distinction for American English learners of French, Gottfried (1984) points out that both vowels can occur in both open and closed syllables (as opposed to other difficult vowel pairs in French which appear in complementary distribution). Clearly, there is a need to look further at these learners' acquisition of the /y/ – /u/ distinction in French, given the previously reported difficulties and the intelligibility problems that can result.

### **Functional load and L2 pronunciation**

According to King (1967), functional load refers to the contrast between linguistic units, normally phonemes, and can be measured by the number of minimal pairs that can be found for a given pair of phonemes. Munro and Derwing (2006) note that “high functional load errors are predicted to have the greatest impact on listeners' comprehension” (p. 522). Brown (1991) argues for priority to be given to “those confluences [of phonemes] of relatively greater importance” (p. 223). In other words, perceiving and producing phonemes appropriately is essential in oral communication.

In regards to functional load, the /y/ – /u/ distinction is fairly high in French. Meers (2009) lists her target words featuring /y/ or /u/; among 28 words containing /u/ and 26 containing /y/, 25% were minimal pairs. In French, mispronunciation can lead to breakdown in communication, for example: *pull* [pyl] ‘pullover sweater’/*poule* [pul] ‘hen’; *au-dessus* [od.sy] ‘on top of’ and *au-dessous* [od.su] ‘underneath.’ From Meers' (2009) list, we see that the possibility for misunderstanding is strong.

### **THE CURRENT STUDY**

In this study, students enrolled in a pronunciation course were compared with those enrolled in other advanced French courses for their distinction between the high-functional load items /y/ and /u/. Specifically, I examine the following question: Does explicit instruction lead to increased ability to pronounce /y/ and /u/ as two distinct vowels in advanced L2 learners of French? In other words, we are examining only production ability.

### **METHODOLOGY**

#### **Participants**

Participants ( $N = 21$ ) were advanced undergraduate learners of French at a large, public Midwestern university. The Phonetics group ( $N = 10$ ) were enrolled in a semester-long phonetics and pronunciation course, taught by the researcher, who is a near-native speaker of French (L1 American English, Ph.D. in French). The class met twice per week, 75 minutes per class session, for 15 weeks. There were four males and six females in the Phonetics group.

Participants in the Phonetics group (enrolled in the class) were not compensated for their time as the tasks involved in the study (a recording at the beginning and the end of the semester) served as part of their course work. There were 14 students in the class, and all consented to have their recordings included in the study, but two were non-native speakers of English; one

failed to provide the second recording; and the recordings provided by a fourth student were unanalyzable in Praat (Boersma & Weenink, 2005) due to excessive background noise that made formants impossible to measure. The Control group ( $N = 11$ ) was enrolled in other advanced French courses, but not in the pronunciation class. They were paid \$5 each after completing the second recording. There were two males and nine females in the Control group.

### **Instructional intervention**

The pronunciation class was a semester-long course, using an early version of *Sons et sens: La prononciation du français en contexte* (Violin-Wigent, Miller, & Grim 2013). The chapter that included /y/ and /u/ addressed both high and low (closed and open) vowels, beginning with /a/, then /i/, /y/, and /u/. This chapter was covered in one 75-minute class period. Each vowel was introduced in an oral text read twice by the instructor<sup>i</sup>, during which students were instructed to answer content questions provided.

During the first reading, students did not look at the text. During the second reading, students were instructed to circle words containing the target sound (in this chapter, each vowel). Follow-up to the second reading consisted of identifying all words with the target sound, answering questions about orthography associated with the sound, and a description (e.g., CLOSED, FRONT, ROUNDED, and ORAL for /y/).

After both /y/ and /u/ were introduced, students completed a discrimination task in which the instructor read a series of words; students marked whether the word contained /y/, /u/, or both. There was an “Expansion” section for each vowel, reviewing orthography and providing pronunciation and transcription practice for each vowel. Homework included transcription and recorded pronunciation exercises, graded and returned by the instructor with comments on pronunciation. These comments used IPA to indicate the students’ actual pronunciation where it deviated from the target pronunciation, along with the target sound. Each chapter (each sound or aspect of pronunciation) proceeded in the same way as the vowel chapter described here.

Students were not held responsible for a given sound or its accurate pronunciation and transcription until that sound had been introduced. The closed rounded vowels were in chapter 14 of 15, so students were only held responsible for accuracy in these vowels for the last two weeks of the semester. By the time that /y/ and /u/ were presented, students were comfortable with the routines of the class and the manner in which feedback was provided.

### **Data collection**

Participant recordings consisted of reading a text provided by one of the authors of *Sons et sens* (Appendix A). Durand and Lyche (2008) note that ‘reading tasks give us systematic access to much of the phonological information we seek...’ (p. 38). A group of native speakers of French from France ( $N = 11$ ) were also recorded, to provide a measure against which both participant groups could be compared. The native speakers were only recorded once, as it was assumed their vowels would not change significantly over the course of a semester. Words containing /u/ and/or /y/ appear in Table 1.

*Target items with /u/ and /y/.*

<b>/u/</b>	<b>/y/</b>
pourquoi	une
pour	une
tout	du
journée	<b>surtout</b>
<b>surtout</b>	Unis
tous	du
pour	jus
soupe	bu
souvent	confiture
pour	du
nous	une
août	
pour	
ou	
soutient	
nous	

### Data Analysis

Recordings were analyzed using Praat (version 5.2.03); measurements were taken for F1, F2, and F3 for each word containing the /u/ or /y/ sound. A Praat script measured each /u/ or /y/ at the midpoint of the segmented vowel. Any F1 measuring higher than 429 Hz<sup>ii</sup>, and any F2 measuring higher than 2499 Hz was checked by hand; most of these high measurements turned out to be accurate, but several were inaccurately measured by Praat and the researcher measured these latter cases by hand, at the midpoint of the vowel. If F1 was measured by hand, the corresponding F2 and F3 were also measured by hand; likewise F3 for any re-measured F2. In total, 36% of F1 measurements and 38% of F2 and F3 measurements were checked by hand. Formants were then normalized using the Bark Difference Metric on the University of Oregon NORM Normalization Suite (Thomas & Kendall, 2007).

While all three formants were measured, for the purposes of this paper, the differences between the advancement of both vowels will be analyzed, as the difference between /u/ and /y/ lies in the “frontness,” or advancement, of the tongue, as measured by F2, which is transformed via the Bark Difference Method to Z3-Z2.

### RESULTS AND DISCUSSION

For all analyses, the alpha level was set at  $p = .05$ .

Descriptive values for measurements of all three formants, for both vowels at each recording time, appear in Tables 2 and 3 below.

*Descriptive Statistics, Height, Advancement, and Rounding of /u/ in Barks, Time 1 and Time*

<b>Group</b>	<b>N</b>	<b>Avg Height</b>	<b>SD Height</b>	<b>Avg Adv</b>	<b>SD Adv</b>	<b>Avg</b>	<b>SD Round</b>
NS	11	11.29472	0.614125	5.807055	0.809073	5.487667	0.448695
P_1	10	10.65164	0.761196	3.861516	0.85033	6.790128	0.783681
C_1	11	10.40921	0.40719	3.711056	0.511776	6.69815	0.476699
P_2	10	10.80622	0.559946	4.132468	0.902896	6.673753	0.665975
C_2	11	10.26451	0.424311	3.722493	1.567903	6.542019	0.635025

NS = Native Speakers ; P\_1 = Phonetics Group Time 1; C\_1 = Control Group Time 1; P\_2 = Phonetics Group Time 2; C\_2 = Control Group Time 2

Table 3

*Descriptive Statistics, Height, Advancement, and Rounding of /y/ in Barks, Time 1 and Time 2*

<b>Group</b>	<b>N</b>	<b>Avg</b>	<b>SD</b>	<b>Avg</b>	<b>SD Adv</b>	<b>Avg</b>	<b>SD</b>
NS	11	11.6705	0.52321	2.20242	0.22041	9.46812	0.57821
P_1	10	11.1822	0.81983	2.60548	0.52439	8.57676	0.86773
C_1	11	10.9695	0.48112	2.52870	0.30452	8.44087	0.49555
P_2	10	11.3864	0.63233	2.71442	0.89610	8.672	0.77821
C_2	11	10.8412	0.44169	2.51858	3.03289	8.32266	0.76833

To measure the distinction between learners' pronunciation of /u/ and /y/, the difference between their mean advancement for each vowel was calculated and compared. Descriptive statistics for Z3-Z2/y/-Z3-Z2/u/ appear in Tables 4 and 5 below.

Table 4

*Descriptive Statistics, Z3-Z2/y/-Z3-Z2/u/, Time 1*

<b>Group</b>	<b>N</b>	<b>Mean</b>	<b>SD</b>	<b>SE</b>	<b>Min</b>	<b>Max</b>
NS	11	3.6046	.87562	.26401	2.40	5.04
P_1	10	1.2560	.58639	.18543	.36	2.25
C_1	11	1.1823	.49241	.14847	.12	2.09
<b>Total</b>	32	2.0380	1.32412	.23407	.12	5.04

*Descriptive Statistics, Z3-Z2/y/-Z3-Z2/u /, Time 2<sup>iii</sup>*

<b>Group</b>	<b>N</b>	<b>Mean</b>	<b>SD</b>	<b>SE</b>	<b>Min</b>	<b>Max</b>
<b>NS</b>	11	3.6046	.87562	.26401	2.40	5.04
<b>P_2</b>	10	1.4180	.56080	.17734	.18	2.00
<b>C_2</b>	11	1.2039	.53984	.16277	.62	2.04
<b>Total</b>	32	2.0961	1.29263	.22851	.18	5.04

A one-way Analysis of Variance (ANOVA) showed a significant difference between groups at Time 1,  $F(2, 29) = 41.5000$ ;  $p < .0001$ . A Tukey HSD post-hoc analysis revealed the difference to be between each learner group and the NS group (NS/Phonetics,  $p < .0001$ ; NS/Control,  $p < .0001$ ). This suggests that at the beginning of the semester, learners' ability to pronounce /u/ and /y/ as two distinct vowels was equivalent across groups but statistically significantly different from native speakers'. Native speakers, clearly, pronounce /u/ and /y/ as two distinct vowels; their mean distance between Z3-Z2 of the two vowels was significantly greater than both learner groups' mean distance between Z3-Z2 of /u/ and /y/.

An ANOVA of distance between Z3-Z2 of /u/ and /y/ at Time 2 also revealed a significant difference between groups,  $F(2, 29) = 45.267$ . Again, a Tukey HSD post-hoc analysis revealed the significant difference to be between the NS group and each of the two learner groups and (NS/Phonetics,  $p < .0001$ ; NS/Control,  $p < .0001$ ). This suggests that at the end of the semester, neither learner group pronounced the two vowels differently. In other words, there was no significant improvement in the Phonetics group after instruction.

## DISCUSSION AND CONCLUSIONS

Contrary to expectations, the analyses described above do not suggest an effect for instruction for advanced students on the distinction of pronunciation of the closed rounded vowels /u/ and /y/ in L2 French. Not only was there no significant difference between groups, neither group's pronunciation became more distinct over the course of a semester of French. However, and perhaps more importantly, this study suggests that pronunciation does not simply improve by being in class. The instruction in this particular class was not sufficient for improvement, but based on the body of research on L2 pronunciation, the author believes that instruction in another form could be.

One limitation of this study is the amount of instruction students in the Phonetics group received on the segments in question. As mentioned in the Methodology section, students only studied the /u-y/ distinction during weeks 14-15 of the semester. This observation leads to pedagogical recommendations, which are to begin pronunciation instruction earlier in learners' study of their L2, and to provide repeated instruction on aspects of the L2 that interfere with intelligibility. Anecdotally, pronunciation instruction is largely reactionary and far from systematic in the early years of language learning. Third- or fourth-year phonetics/pronunciation classes such as the one the Phonetics group took are the only consistent instruction that L2 learners (apart from ESL) typically receive. I believe that the results of this study support earlier, systematic intervention, along with the 3<sup>rd</sup>/4<sup>th</sup> year phonetics class as a

codification of what students have learned as they study the language, with additional exploration of the phonology of the L2. In this same vein, further research may look at a series of lessons on pronunciation of /u/ and /y/ on learners at various stages of competence.

The other limitation of this study is the small *N*. This is a result of the small pool of French majors and minors at the university and the necessarily small classes required to teach foreign languages effectively. Future research could include a larger group of students, or perhaps students at several universities, with more participants and more data points, and therefore more statistical power. However, the caveat there would be ensuring uniformity of instruction over semesters, at different institutions, by different instructors.

This study was designed to look at the effect of a semester-long phonetics class on the distinction between the closed rounded vowels /u/ and /y/ in L2 French. It did so by comparing students enrolled in such a class with peers enrolled in other advanced French classes at the same university. While the results were not as expected, further reflection of the amount of instruction on this particular aspect of French suggest that more systematic, continued instruction on /u/ and /y/ will improve learners' ability to pronounce the two vowels distinctly.

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## APPENDIX

### Text used for recording<sup>i</sup>

*Pourquoi le pain est-il aussi important pour les Français ? Tout simplement parce qu'ils ne peuvent pas envisager une journée, ou même un repas, sans pain. Mais le pain est-il si nécessaire pour manger ? En un mot oui, parce qu'il rehausse les autres aliments.*

*Pour le petit-déjeuner, rien de meilleur qu'une tartine de pain avec du beurre et de la confiture. A midi, le pain accompagne les salades et surtout soutient le fromage. Entre les deux, il absorbe la sauce de la viande et des haricots. A quatre heures, tous les enfants aiment manger du pain et du chocolat en sortant de l'école. Pour le dîner, de la soupe et du pain suffisent souvent pour un repas équilibré.*

*Même aux États-Unis, le pain fait partie de la vie. Comment imaginer un sandwich au beurre de cacahuètes sans pain ? Et les hamburgers ?*

### Phrases

*Nous aimons le goût du jus que nous avons bu à Honolulu en août.*

*La vieille cliente achète des fruits pour Louis. Elle les mange avec lui à minuit dans une ruelle.*

### Translation

Why is bread so important to the French? Simply because they cannot imagine a day, or even a meal, without bread. But is bread so necessary for eating? In a word, yes, because it enhances other foods.

For breakfast, there is nothing better than a slice of bread with butter and jam. At noon, bread accompanies salads and, above all, supports cheese. Between the two, it absorbs the sauce from the meat and beans. At four o'clock, all children love to eat bread with chocolate when leaving school. For dinner, some soup and bread often suffice for a balanced meal.

Even in the United States, bread is part of life. How could one imagine a peanut-butter sandwich without bread? Or hamburgers?

### Sentences

We like the taste of the juice we drank in Honolulu in August.

The old lady client buys fruit for Louis. She eats them with him at midnight in a passageway.

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<sup>i</sup> The text used in the class, *Sons et sens*, was in development during the semester in which the class was taught and no audio files were available.

<sup>ii</sup> Tubach (1989) gives the following average values for F1 and F2 in hexagonal French: /u/ F1 = 315; F2 = 764; /y/ F1 = 300; F2 = 1750. 429 is 143% of 300; 2499 is 143% of 1750.

<sup>iii</sup> NB: NS were only recorded once; this recording was compared to Time 1 and Time 2 for the learner groups.

<sup>iv</sup> ‘Honolulu’ and ‘hamburger’ were not included in the analysis, as those words are used in English as well and have particularly American associations. Learners may have read them in English or in French; they were not given any specific instructions on those word