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**Title:**

Experienced Teachers' Perspectives on Priorities for Improved Intelligible Pronunciation: The Case of Japanese Learners of English

**Running Head:**

PRIORITIES FOR IMPROVED PRONUNCIATION

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### **English Abstract**

The current study was designed as an exploratory investigation of the usefulness of experienced teachers' perspectives as a means to identify teaching and learning priorities for a particular group of L2 learners (i.e. native speakers of Japanese [NJs] learning English in EFL settings) to acquire intelligible pronunciation. A total of 120 experienced teachers (61 native speakers of English [NEs] and 59 NJs) rated 25 problematic features on a 5-point scale ranging from "very important to *teach*" to "not very important to teach." The ordered ranking suggests the teachers' opinion is that the syllabus needs to include not only (a) pronunciation problems which are generally problematic in other ESL/EFL classrooms but also (b) sound features which are highly specific to NJs. The construct validity of the experienced teachers' judgment will be discussed in light of relevant findings in L2 pronunciation research.

***English key words:*** Pronunciation teaching, intelligible pronunciation, teacher cognition, teacher questionnaire, second language pedagogy

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### Japanese Abstract

第二言語話者が優先的に学習すべき発音項目を選定し、効率・効果的に「聞き取りやすい発音」の習得を促す事は非常に大切である。本研究では、経験のある言語教師の意見（i.e., 言語教師認知）を参考にし、日本人英語学習者を対象とした実践的な発音教育シラバスの作成を試みた。第一に、日本人英語学習者が陥りやすい発音問題点を詳細にレビューし、そこから25個の特に顕著とされる学習・教授項目を選び出した。第二に、120人の経験ある英会話講師（61人のネイティブスピーカーと59人のノンネイティブスピーカー）が、それらの学習・教授に関する重要度を1（あまり重要ではない）から5（とても重要である）のスケールを使いレーティングを行った。最後に教師アンケートデータを主因子分析にかけ、その結果を最新の発音教育研究結果と照らし合わせながら、発音教育における言語教師認知の有用性について批評的に論じた。

**Japanese key words:** 発音教育、聞き取りやすい発音、言語教師認知研究、言語教師アンケート、第二言語教育

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## PRIORITIES FOR IMPROVED PRONUNCIATION

### Experienced Teachers' Perspectives on Priorities for Improved Intelligible Pronunciation: The Case of Japanese Learners of English

While second language (L2) speech production is generally foreign-accented, many researchers have emphasized the importance of attaining “intelligible pronunciation” rather than “accent-free speech” for the purpose of successful L2 communication (for a comprehensive review, see Derwing & Munro, 2005; Levis, 2005). As Field (2005) claims, “arguably the most pressing issue in L2 pronunciation research today is the quest to identify the factors that most contribute to speaker intelligibility” (p. 399). Despite this mandate, researchers have yet to answer one important question: How can we identify and prioritize a set of problematic pronunciation features for particular L2 learners—native speakers of Japanese (NJ) learning English in EFL settings—to help them acquire “intelligible pronunciation in L2 classrooms? The current study examines this topic drawing on a survey in which the advice of 120 experienced EFL teachers was examined (i.e., a teacher judgment approach). We will discuss the validity of the teachers' perspectives towards improved intelligibility in light of relevant findings in L2 pronunciation research.

### **Related Literature**

#### **Intelligible Pronunciation**

A number of L2 speech studies have shown that L2 speech production normally entails foreign accents due to several variables such as L1 background (Flege, 2003), age of acquisition (Flege, Munro, & MacKay, 1995), quality and quantity of input (Flege, Yeni-Komshian, & Lin, 1999), and motivation, attitude and aptitude toward L2 speech learning (Moyer, 1999). These

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findings of unavoidable foreign accents have impacted the paradigm shift within pedagogical practice in pronunciation teaching, where mastery of native-like pronunciation had long been considered the ideal goal (i.e., the nativeness principle). An increasing amount of research has focused on the importance of new approaches towards pronunciation teaching, where the primary goal is to lead students to exceed minimal requirements for intelligibility and to attain communicative success (i.e., the intelligibility principle) (for a review of various approaches to pronunciation teaching, see Celce-Murcia, Brinton, Goodwin, & Griner, 2010).

Primary research has defined intelligible pronunciation (or intelligibility) from significantly different perspectives (for details of definition fuzziness, see Isaacs, 2008). In a broader sense, Derwing and her colleagues have investigated how a wide range of linguistic errors (e.g., grammatical, lexical, semantic, and phonemic and phonological errors) influence NE listeners' overall perception of three different aspects of L2 speech production (i.e., accentedness, comprehensibility, and intelligibility) via rating and transcription tasks (e.g., Derwing & Munro, 1997). In a narrower sense, other L2 pronunciation studies have extensively explored what speech properties (i.e., segmental and suprasegmental aspects of L2 sounds) constitute intelligible pronunciation (see below). Given that the ultimate goal of pronunciation teaching is to enhance L2 phonological development, it is crucial to synthesize the results of the latter line of L2 pronunciation research in pursuit of direct pedagogical implications.

In this paper, we follow the definition of intelligible pronunciation by Field (2005) as “the extent to which the acoustic-phonetic content of the message is recognizable by a listener” (p. 401), and the notion of intelligibility-based argument for pronunciation instruction by Levis (2005) that “certain types of pronunciation errors may have a disproportionate role in impairing

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comprehensibility... instruction should focus on those features that are most helpful for understanding” (p. 370-371). In the next sub-section, we review key pronunciation features which impact the reactions of native speakers of English (NEs) toward foreign accented speech.

### **Crucial Features**

**Suprasegmentals.** Hahn (2004) investigated the role of primary stress (i.e., marking the focus of content with relatively high pitch tones) in NEs’ understanding of non-native speakers of English (NNEs), asking NEs to listen to various short lectures delivered by one NNE talker in which primary stress was carefully manipulated. The results showed that correct assignment of primary stress significantly influenced NE listeners’ comprehension and memorization of the content. Field (2005) asked both NE and NNE listeners to transcribe various types of NNE speech tokens, finding the negative impact of the misallocation of lexical stress (i.e., making vowels in stressed syllables long and loud). In order to corroborate the role of speech rate in L2 speech, Munro and Derwing (2001) asked NE listeners to assess comprehensibility and accentedness of NNE extemporaneous speech samples in which speech rate was digitally sped up and slowed down via speech recognition software. They found that, although speeding up non-native utterances by a factor of 10% generated positive effects on listeners’ judgment, rate increases of about 30% tended to interfere with their evaluations. They suggested that a common pedagogical practice—slowing down extemporaneous speech—might be “unlikely to be a beneficial strategy for most L2 learners, except for those who speak at especially fast rates” (p. 467).

**Segmentals.** One of the pedagogically-relevant concepts for segmental-based instruction is the Functional Load theory (Brown, 1988). This hypothesizes that functional load of English



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phonemic contrasts for listeners can be determined by key factors such as (a) the frequency of minimally paired words, (b) the degree of neutralization between regional English dialects and (c) segmental positions within a word. For example, whereas the contrast of /ɪ/-/I/ in word initial positions distinguishes relatively many words (e.g., “lead” vs. “read” “lock” vs. “rock”), the contrast in word final positions (e.g., “wall” vs. “war” “tall” vs. “tore”) remains unclear according to the regional varieties of English (e.g., the rhotic /ɪ/ is typical of GA but not RP). Thus, the contrast in word initial positions has a high functional load. In their experiment, Munro and Derwing (2006) showed that segmental errors in high functional load contexts negatively influence NE listeners’ perception of accentedness and comprehensibility whereas those in low functional load contexts yielded only a minor effect on comprehensibility scales.

### **Setting Teaching Priorities**

Previous studies have identified several crucial speech properties for intelligible pronunciation by NNE students with heterogeneous L1 backgrounds (i.e., ESL contexts). However, it remains unclear how to elaborate an individualized phonological syllabus (i.e., identifying and prioritizing a range of key sound features) in relation to a particular L1-L2 context where both universal and L1-related pronunciation problems play a key role in speech intelligibility (i.e., EFL contexts) (Riney, Takada, & Ota, 2000). Setting such instructional priorities is a vital issue, especially in L2 classrooms, where the time allocated to teaching pronunciation is limited, so that teachers and students must make the most of it (Celce-Murcia et al., 2010; Derwing & Munro, 2005).

Although some efforts have been made to pursue this topic (i.e., setting teaching/learning priorities for acquiring intelligible pronunciation), the findings of previous studies are far from

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conclusive. For example, Jenkins (2000) proposed new pronunciation norms for the purpose of learning international phonological intelligibility: Lingua Franca Core (LFC), which consists of prioritized phonological and phonetic features (mainly segmentals) based on her observations of the interactions between NNEs in ESL settings. Jenkins argued that NNEs who share different L1 backgrounds likely depend on bottom-up strategies (dependency on acoustic information) to decode other NNEs' accented speech rather than top-down approaches (reliance on contextual information). She identified several key pronunciation features in resolving any communication breakdowns that cannot be solved with syntactic and contextual cues. These features include consonant sounds (other than the voiceless and voiced dental fricatives and dark /l/), vowel quantity, and deletion of sounds in word-initial and medial consonant clusters (instead of addition of epenthesis). She also argued that most of the suprasegmental pronunciation features, such as weak forms, word stress, stress-timing, pitch movement and other features of connected speech (reductions, assimilations) might be unteachable, because "learning rarely follows" (Jenkins, 2000, p. 147).

Although her intuitive attempts to establish LFC as a syllabus could greatly inform teachers and learners in L2 classrooms, the construct validity of LFC is not without problems, especially in terms of her rationale for selection of core features that affect "NNE-NNE intelligibility." In her review, Derwing (2008) commented that "the available evidence is very limited, based on a small sample of communication breakdowns" (p. 352). Similarly, Dauer (2005) pointed out that "It is not clear whether these results can be generalized to a larger population of less literate learners or to more formal extended discourse" (p. 549).

### **Teacher Questionnaire**

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Identifying the relative difficulty, learnability, and teachability of target linguistic features for a particular group of L2 learners has also been extensively discussed in L2 education research. In his review of research framework in instructed L2 studies, Ellis (2006) recommended a teacher judgment approach whereby researchers elicit experienced L2 teachers' opinions to determine the degree of learner problematicity. Much criticism has been directed towards the accuracy of teacher cognition and pedagogical content knowledge, especially among inexperienced teachers (Gatbonton, 2008). Previous large-scale teacher questionnaire studies have found that very few teachers receive adequate training, especially in the area of pronunciation teaching (Foote, Holtby, & Derwing, 2011).

Yet, researchers have often drawn on experienced teachers' beliefs and knowledge as a resource for shedding light on certain complex topics in L2 classrooms, such as examining problematic grammatical features for EFL learners (Robinson, 1996) and teachers' pedagogical knowledge and reasoning (Basturkmen, Loewen, & Ellis, 2004). This is arguably because their opinions are based on their professional teaching experiences, and tend to reflect the reality of their classrooms (for a review on teacher cognition research, see Borg, 2006).<sup>1</sup>

Though less common, the teacher judgment approach has been used in L2 pronunciation teaching contexts. Jenkins (2005), and Sifakis and Sougari (2005) surveyed how experienced teachers perceive the pedagogical possibility to implant NNE pronunciation models as opposed to NE norms such as General American and Received Pronunciation. Saito (2011) applied the

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<sup>1</sup> In the context of pronunciation teaching, Derwing and Munro (2005) acknowledged, “[experienced teachers] who have strong observation skills and who are phonologically aware may address learners’ needs satisfactorily. These same teachers may develop critical evaluation skills so that they gain a sense of what will and will not work for their students. Their intuitions may well be confirmed by research findings” (p. 389).

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teacher judgment approach to pronunciation teaching context, and elaborated and tested a ranked order of important segmentals for NJs to improve their speech intelligibility in EFL settings. The results first identified eight English-specific segmentals, /æ,f,v,θ,ð,w,l,ɪ/ as crucial segmentals based on cross-linguistic analyses as well as the questionnaire of 48 experienced NJ teachers in Japan. Although the selected eight segmentals constituted both high (e.g., /l/, /ɪ/) and low (/θ/,/ð/) functional load sounds, they were found by listeners to negatively influence NE listeners' perceived *accentedness* (i.e., phonological nativelikeness of utterances) and their *comprehensibility* (i.e., how easy it is to understand what they say). The study lends some empirical support to the construct validity of experienced teachers' perspectives on priorities for improved intelligible pronunciation.<sup>2</sup> In the earlier study, the teachers' opinions were elicited via only one open-ended question, and its discussion was limited to segmentals.

Building on the research method by Author (Saito, 2011), the current study will ask 120 experienced teachers (61 NE and 59 NJ teachers) to rate the relative teaching priorities of a list of problematic segmental and suprasegmental pronunciation features on a 5-point scale. The appropriateness of their opinions will then be evaluated based on relevant findings in L2 pronunciation research.

### **Listener Factor**

Given that the number of NNEs greatly exceeds the number of NEs and that English is used as an international language (Crystal, 2000), L2 pronunciation studies have paid ever more attention to both NE and NNE perceptions of speech intelligibility. Whereas some argue that intelligibility is defined differently between NNE-NE and NNE-NNE interactions (e.g., Jenkins,

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<sup>2</sup> The fact that these teachers identified sounds that have a low functional load (e.g., /θ/, /ð/) could be seen as evidence of the untrustworthiness of teacher cognition in L2 pronunciation research.

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2000), recent studies have generally shown that NE and NNE listeners tend to exhibit similar perceptual patterns towards foreign-accented speech regardless of their L1 backgrounds (e.g., Field, 2005; Munro, Derwing, & Morton, 2006). The results of Munro et al.'s (2006) study where 40 NE and NNE listeners (English, Japanese, Cantonese, and Mandarin listeners) transcribed 48 NNE talkers' extemporaneous speech production (Cantonese, Japanese, Polish, and Spanish) were noteworthy. Both NE and NNE listeners agreed on which sounds were the most difficult and which were the easiest to understand despite their L1 backgrounds (see also Field, 2005). The results led Munro et al. (2006) to conclude, "it is a reasonable expectation that if one student (or teacher) genuinely finds another student's utterances difficult to understand, there is a likelihood that other students will have a similar experience, regardless of their L1 backgrounds" (p. 128). Their study found, however, that only Japanese listeners benefited from their own Japanese-accented speech, which suggests some influence of L1 background on speech intelligibility. Building on their research findings, a decision was made to include both NE teachers and NJ teachers as expert-judges in order to examine what characterizes intelligible pronunciation for NJs from various perspectives.

### **Method**

#### **Participants**

One of the most obvious problems with teacher questionnaire studies of this kind is raters' subjectivity. Teachers' perceptions of "intelligible pronunciation" could widely vary depending upon (a) the amount of their teaching experience, (b) their familiarity and attitude towards foreign-accented speech and a particular dialect (e.g., American, British and Australian English), and (c) their knowledge in phonetics and pronunciation teaching. Therefore, in order to

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ensure the quality/validity of the teacher judgment, special efforts were made to select and recruit highly-experienced EFL teachers with similar teaching backgrounds in EFL classrooms in Japan.

First, the author contacted a nation-wide language institute with approximately 3,000 affiliated teachers. As opposed to public institutions, such as high schools and universities, where English is typically taught through audio-lingual and grammar translation methods, this private language institute provides adult NJ students with conversation-based English classes (i.e., the focus of their classes is not on form but on meaning). Given that teachers in such private language institutes are familiar with a wide variety of accented conversational English speech by adult NJ students, they should be qualified to make intuitive judgments as to what kinds of pronunciation problems tend to hinder the success of their students' L2 communication.

During the first meeting with the language institute, the author clearly explained (a) the purpose of the study (i.e., setting teaching/learning priorities) and (b) the qualifications of the participating teachers (e.g., a great amount of teaching experience with a wide range of NJ students and familiarity with their conversational L2 speech). Out of approximately 3,000 teachers, only 120 teachers (61 NEs and 59 NJs) were screened by the author as well as the institute for the following three reasons. First, in addition to their teaching experience (more than five years), these teachers were also proficient teacher trainers.<sup>3</sup> Second, they also reported that they had not received any previous training for pronunciation teaching; the impacts of their prior knowledge for pronunciation teaching on the intelligibility rating could be minimized in the

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<sup>3</sup> According to the institute, a small number of teachers can be promoted to be teacher trainers on the basis of the amount of teaching experience and the level of teaching skills.

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current study.<sup>4</sup> Third, given that one of the research purposes in the current study was to compare NE and NJ teachers' perceptions of intelligible pronunciation, the decision was made to recruit a similar number of NE teachers ( $n = 61$ ) and NJ teachers ( $n = 59$ ) for comparison.

It must be noted that one variable—teachers' familiarity with and attitude towards a particular English dialect—could not be controlled systematically. This point will not be further discussed in the current study. For example, as for the 61 NE teachers, the type of their L1 English dialects slightly differed ( $n = 49$  for General American English,  $n = 4$  for British English,  $n = 4$  for Australian English,  $n = 3$  for Canadian English,  $n = 1$  for New Zealand). As for the 59 NJ teachers, it was unclear as to which types of English dialects they were most familiar with. Clearly, the teachers' experience with, attitude toward, and preference for one particular English dialect over another might have interacted to influence their intelligibility judgment. However, given that a majority of practitioners as well as EFL researchers in Japan are becoming more aware of a variety of English dialects, and developing authentic materials to learn English as an international language (for a review of World Englishes in Asian EFL classrooms, see Matsuda, 2002), the time is ripe for a questionnaire study to survey and examine teachers' current perspectives/consensus of what sounds are important/unimportant for intelligible pronunciation in L2 classrooms."<sup>5</sup>

### Procedure

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<sup>4</sup> Although some of the NJ teachers might have opportunities to learn about intelligible pronunciation on their own, especially during their L2 learning, such resources (e.g., textbooks and pronunciation training) are highly limited in Japanese EFL contexts, but also in many other L2 classrooms (Derwing & Munro, 2005).

<sup>5</sup> In fact, according to the institute, although several pronunciation experts reported that Japanese English education has been influenced by, in particular, GA for a long time (Matsuda, 2002; Riney & Anderson-Hsieh, 1993), their teaching/learning materials are not restricted to GA anymore; students are encouraged to expand their familiarity to different dialects such as British and Australian English.

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The current study took a quantitative approach in which a large number of highly experienced teachers were asked to rate a list of pronunciation problems identified in the cross-linguistic analyses (see results below). The purpose of the questionnaire was to elicit their opinions as to the relative weights of these problems in teaching for intelligible pronunciation. The assumption in the current study is that investigating teachers' perceptions reveals pedagogical recommendations not only for teachers, but also for learners; pronunciation features considered as important teaching targets by teachers could be equally crucial for learners to study in order to acquire intelligible pronunciation.

First, the questionnaire was carefully prepared so that the teachers could clearly understand (a) the purpose of the questionnaire as well as (b) the rating procedure (see Appendix). With respect to the purpose, following the definition of intelligible pronunciation described earlier, it was stressed that the questionnaire was intended to find out what teachers thought would help students achieve “intelligible pronunciation,” but not “accent-free speech.” The teachers were asked to rate the relative importance of each pronunciation feature on a 5-point scale (1. Very important to teach – 5. Not very important to teach), with focus on sound properties, without taking into account other factors such as talkers' gestures and listeners' familiarity with topics. Each pronunciation feature was followed by three or four example cases so the teachers could understand what kind of problems the questionnaire referred to (e.g., “rock, right, read” for English /ɹ/, “HE studied yesterday vs. he STUDIED yesterday” for sentence stress).

Next, the questionnaire with consent forms was sent to the 120 participating teachers via the language institute. Teachers were encouraged to contact the author whenever they found



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anything in the questionnaire unclear. The questionnaire was administered during a three-month period.

### Results

#### Cross-linguistic Analyses

**Selection criteria.** The cross-linguistic analyses were conducted to find pronunciation features that may affect the NJ learners' accent, comprehensibility, and/or intelligibility. The author first identified and referred to published articles in major academic journals (e.g., *JALT Journal*, *Language Learning*, *TESOL Quarterly*) and books (e.g., Celce-Murcia et al., 2010) that reported pronunciation problems which are (a) specific to NJs (especially at segmental levels) or (b) typical of all ESL/EFL learners (likely at suprasegmental levels); all of these pronunciation features were taken into account for the cross-linguistic analysis. The current study is designed to reveal how and to what degree L1-related and universal pronunciation problems contribute to intelligible pronunciation.

**Segmentals.** Due to a great phonetic distance between Japanese and North American English<sup>6</sup> in the domains of vowel sounds (English: 15; Japanese: 5) and consonant sounds (English: 24; Japanese: 14), it has been shown that NJs likely transfer their L1 phonological knowledge resulting in pronunciation errors, especially in English-specific segmentals. In conjunction with a wide range of previous cross-linguistic research (for review, see Lambacher, 1999; Riney & Anderson-Hsieh, 1993), 17 segmental problems including three allophonic rules

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<sup>6</sup> The cross-linguistic analyses in the current study focused specifically on General American English (GA), because all of the literature cited here related to the cross-linguistic difference between Japanese and GA. The difference between GA and other dialects such as Received Pronunciation (RP) and Australian English mainly lies in vowel formation (Ladefoged, 2005), thus efforts were made to highlight segmental and suprasegmental rules common to various dialects of English (e.g., consonant sounds are relatively similar between various types of English). For example, all English dialects have vowel sounds /æ, ʌ/ both of which have been reported to be problematic for NJs (Lambacher, 1999).

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were highlighted in the current study. These sounds include two vowel sounds /æ, ʌ/, diphthongs /aʊ, aɪ, oʊ, ɔɪ, eɪ/<sup>7</sup>, three approximants /w, ɹ, l/, two nasals /n, ŋ/, plosives /p, t, k/, five fricatives /θ, ð, f, v, h/, and three allophonic rules /si, ʃi, ti/. The problematicity of these segmental features is detailed in Table 1.

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 TABLE 1 AROUND HERE  
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**Suprasegmentals.** Whereas English is a stress-timed language (i.e., all vowels except those in stressed syllables are reduced and produced as weak forms), Japanese is a mora-timed language (i.e., vowels in each mora are equally pronounced). This cross-linguistic difference at prosodic levels leads NJs to speak English in a significantly different manner from NEs (Riney & Anderson-Hsieh, 1993). In addition, given that complex syllables such as Consonant-Consonant-Vowel-Consonant (CCVC) and CCVCC are not allowed in the Japanese mora-system, like other NNEs, NJs tend to delete some consonant sounds or add epenthesis vowels in the case of English consonant clusters (Lin, 2003). Finally, realization of stress is substantially different between English and Japanese both at lexical and sentence levels. On one hand, NEs draw on (a) vowel quality for lexical stress (i.e., using long and loud vowels for stressed syllables) and (b) pitch changes for sentence stress (i.e., using high pitch for the focus of content). On the other hand, NJs mark stress with the limited range of pitch changes but only at lexical levels.

Consequently, NJs tend to fail to mark dynamic intonation patterns in English at sentence levels,

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<sup>7</sup> Again, the number of diphthongs differs between dialects (e.g., GA, RP and Australian English). Thus, the current study did not further segment the diphthong categories.

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resulting in their so-called *monotonous* speech (Ohata, 2004). The problematicity of these suprasegmental features is detailed in Table 2.

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TABLE 2 AROUND HERE  
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In sum, 25 pronunciation features (17 segmentals and 8 suprasegmentals) were identified as problematic as well as crucial for NJs to acquire intelligible pronunciation. Next, they were submitted to the judgment of 120 NE and NJ teachers, who rated their relative teaching priorities on a 5-point scale.

### **Principle Component Analyses**

All of the 120 teachers successfully completed the questionnaires and returned them to the author via the language institute. The first step was to see whether these 25 pronunciation features could be grouped into larger categories reflecting general patterns. For this purpose, the Principle Component Analysis (PCA) was performed by employing varimax rotation with Kaiser normalization. The factorability of the entire dataset was examined and validated via two tests: the Bartlett's test of sphericity ( $\chi^2 = 1102.07, p < .001$ ) and the Kaiser-Meyer-Olkin measure of sampling adequacy (.751). Because eight factors of eigen values were found above 1, a decision was made to specify an eight-factor solution (as seen in Table 1). This model accounted for 67.13% of the total variance in the rating scores. Second, these eight factors were ranked and ordered on the basis of the total mean of the rating scores for each factor. The profiling of eight factors was also conducted, in light of how the pronunciation features were grouped together. The results are as follows:

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1. Major segmentals /l, ɹ, ð, θ, v/ ( $M = 1.43, SD = 0.86$ )

Given that this factor consisted of five segmentals /l, ɹ, ð, v, θ/ with the lowest mean, this group was labeled as “major segmentals,” which accounted for 12.86% of the total variance in the rating scores.

2. L1 effect at syllable levels [Cognates, Syllabification] ( $M = 1.65, SD = 0.85$ ),

This factor consisted of cognate and syllabification problems both of which are related to NJs’ difficulties with complex syllable structures. So, this factor was labelled as “L1 effect at syllable levels,” which accounted for 7.12% of the total variance.

3. Assimilation /si, fɪ, ti/ ( $M = 1.82, SD = 1.01$ )

Because all three of these pronunciation problems are related to allophonic rules where fricatives are assimilated into the ensuing high front vowels, this factor was labelled as “assimilation,” which accounted for 8.07% of the total variance.

4. Stress/Intonation [sentence/lexical stress, intonation] ( $M = 2.09, SD = 0.98$ )

This factor consisted of these three highly related problems (i.e., NJs have difficulties with these features due to cross-linguistic difference in the pitch variation and vowel quality). This factor was labelled “stress/intonation,” which accounted for 7.09% of the total variance.

5. Secondary segmentals /æ, ʌ, f/ ( $M = 2.22, SD = 1.08$ )

The segmentals in this factor /æ, ʌ, f/ received higher mean values than those in the “most important segmentals” /l, ɹ, ð, θ, v/; this factor was labeled as “secondary segmentals,” which accounted for 8.60% of the total variance.

6. Diphthongs /aʊ, aɪ, oʊ, ɔɪ, eɪ/ ( $M = 2.40, SD = 0.96$ )

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This factor consisted of only one pronunciation feature (i.e., diphthongs), which accounted for 4.55% of the total variance.

### 7. Minor segmentals /p, t, k, w, n, ŋ, h/ + contractions ( $M = 2.71, SD = 1.11$ )

The segmental problems grouped in this factor /p, t, k, w, n, ŋ, h/ received higher mean values compared to the other segmental groups (/l, ɹ, ð, θ, v/ and /æ, ʌ, f/). So, this factor included the contraction problem and was thus labeled as “minor segmentals + contractions.” This factor accounted for 12.45% of the total variance.

### 8. Fluency problems [fluency, speech rate] ( $M = 2.76, SD = 1.11$ )

Given that both features—fluency and speech rate—concern the number of pauses and repetition as well as speech rate, this factor was labeled as “fluency,” which accounted for 6.39% of the total variance.

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 TABLE 3 AROUND HERE  
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## ANOVA Analyses

In order to answer the third research question (i.e., the extent to which NE and NJ teachers agree and disagree in their perceptions of intelligible pronunciation), a two-way ANOVA was conducted on (a) the pronunciation factors (eight component scores) as dependent variables and (b) the teacher type (NE/NJ teachers) as independent variables. An alpha level was set at a  $p < .05$  level for all of the following statistical analyses.

The ANOVA results detected significant effects for the overall Pronunciation Factors  $\times$  Teacher Type interaction,  $F(7, 826) = 3.927, p < .001$ . Subsequently, a set of simple main effect

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analyses of the teacher types further revealed in which pronunciation factors NE and NJ teachers demonstrated similar or different judgment patterns. First, the analyses did not find any significant relationship between the teacher type (i.e., whether teachers were NEs or NJs) and (a) major segmentals,  $F(1, 118) = 0.401, p = .528$ , (b) L1 effect at syllable levels,  $F(1, 118) = 0.045, p = .861$ , and (c) secondary segmentals,  $F(1, 118) = 0.031, p = .861$ .

Second, the analyses showed, that the teacher type could be a significant factor for (a) assimilation,  $F(1, 118) = 4.086, p = .045$ , (b) stress/intonation,  $F(1, 118) = 4.591, p = .034$ , (c) diphthongs,  $F(1, 118) = 8.525, p = .004$ , (d) minor segmentals,  $F(1, 118) = 6.646, p = .011$ , and (e) fluency,  $F(1, 118) = 4.898, p = .029$ . A close examination of the mean values of their rating scores noted several intriguing patterns between NE and NJ teachers. On the one hand, NJ teachers rated three factors more important than NE teachers: (a) assimilation ( $M = 2.01$  for NE teachers,  $M = 1.62$  for NJ teachers), (b) stress/intonation ( $M = 2.26$  for NE teachers,  $M = 1.91$  for NJ teachers), and (c) minor segmentals ( $M = 2.73$  for NE teachers,  $M = 2.67$  for NJ teachers). On the other hand, NE teachers rated two other factors more important than NJ teachers: (a) diphthongs ( $M = 2.26$  for NEs,  $M = 2.54$  for NJs) and (b) fluency ( $M = 2.67$  for NEs,  $M = 2.85$  for NJs).

## Discussion

### Cross-linguistic Analyses

The first research question asked which pronunciation features have been problematic for the NJ learners' accent, comprehensibility, and/or intelligibility. As summarized in Tables 1 and 2, cross-linguistic analyses have identified a list of 25 pronunciation features. Despite much work done on this topic (i.e., interlanguage development of NJ learners of English), little

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research attention has been directed towards the potential contributions of these features to speech intelligibility and successful communication.

### Teaching/Learning Priorities

The second research question asked how the teachers prioritized the 25 features identified in the cross-linguistic analyses for instruction and improved intelligibility. The principle component analysis of the 120 questionnaires identified and prioritized eight problematic pronunciation areas for NJs in the following order: (a) major segmentals /l, ɹ, ð, θ, v/ → (b) L1 effect at syllable levels (cognates, syllabification) → (c) assimilation /si, fi, ti/ → (d) stress/intonation (sentence/lexical stress, intonation) → (e) secondary segmentals /æ, ʌ, f/ → (f) diphthongs /aʊ, aɪ, oʊ, ɔɪ, eɪ/ → (g) minor segmentals /p, t, k, w, n, ŋ, h/ + contractions → (h) fluency problems (fluency, speech rate). The questionnaire yielded the following pedagogical suggestions as to what features should be taught and what order they should be taught in.

1. First, teachers should teach the five crucial segmentals /l, ɹ, ð, θ, v/, and practice pronouncing complex syllables such as CCVCC and CCVCCC especially when it comes to Katakana words (cognates).
2. Next, teachers should teach assimilation rules and several other English-specific segmentals /æ, ʌ, f/. They should also change vowel quality (producing long and loud vowels) to mark lexical stress, and use a wide range of pitch to mark sentence stress and dynamic intonation patterns in English.
3. Lastly, teachers should enhance NJs' production abilities, focusing on their diphthong problems /aʊ, aɪ, oʊ, ɔɪ, eɪ/, and other segmentals /p, t, k, w, n, ŋ, h/. They also should

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encourage NJs to speed up their speech rate and to reduce pauses and repetitions (fluency problems).

It remains controversial to use the opinions of teachers (especially inexperienced ones) to arrive at certain types of recommendations in L2 classrooms (cf. Gatbonton, 2008). Previous surveys of language teachers in regards to pronunciation instruction suggest that many lack expertise in this area of language learning (e.g., Foote et al., 2011), and most of the participating teachers in the current study indeed reported little professional training on how to teach pronunciation. Given such methodological difficulty (i.e., teacher questionnaire), we selected 120 experienced teachers to rate the relative teaching importance of 25 pronunciation features chosen from cross-linguistic analyses. We now turn our discussion to evaluating whether and to what degree teacher judgments can legitimately inform the creation of a tailored phonological syllabus for a particular group of L2 learners (i.e., NJ learners of English) to acquire intelligible pronunciation.

**General patterns.** The fact that the PCA found eight distinctive groups based on the questionnaire results among 120 teachers with a relatively a high accountability ( $R^2 = .6713$ ) indicates that the teachers shared consensus on these relatively crucial pronunciation features for NJ learners.<sup>8</sup> Although one might argue that practitioners without specific research experiences likely have subjectively-skewed opinions on what is meant by intelligible pronunciation, the results suggest that the teachers with homogeneous teaching experiences (i.e., conversational

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<sup>8</sup> For a statistics account, if teachers had not generally reached agreement with each other in terms of what to teach for NJs to acquire intelligible pronunciation due to a great deal of their subjectivity, the PCA would have failed to find any larger patterns among the teachers' individual questionnaire answers.



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EFL in a private language) had similar working definitions of intelligible pronunciation in order to decide teaching priorities for Japanese learners.

**Contents of priorities.** The ranked order of the eight problematic pronunciation areas generally concurred with relevant findings in L2 pronunciation research. For instance, the English approximant contrast /l/-/ɹ/ identified as top segmental problems in the current study can be considered equally crucial by many EFL researchers. Riney et al. (2000) offered detailed documentation of the link between NJs' accurate production of a non-native contrast /l/-/ɹ/ and foreign accent scores judged by NE listeners.<sup>9</sup> Their results showed that a great deal of variance in foreign accent ratings were strongly correlated to NJs' Japanese flap substitution for English /l/-/ɹ/ (i.e.,  $r = -.700-.800$ ,  $p < .01$ ). According to the Functional Load theory, the English /l/-/ɹ/ contrast (especially at word initial positions) includes a large number of high-frequent minimal pairs and no neutralization in any regional dialects of English (for similar discussion on English /v/, see Brown, 1988).

In addition, because a range of complex syllable structures are allowed in the English phonetic system, a majority of ESL/EFL learners need to learn such syllable structure rules (i.e., phonotactic knowledge) as a priority (Lin, 2003). According to many L2 speech models, L2 learners first encode word-sized units of L2 input during their initial stage of vocabulary learning, focusing especially on the phonotactic and prosodic features of speech streams at a global level. Thus, these theoretical accounts agree that developing learners' robust phonotactic knowledge plays a crucial role in successful word and sound recognition (Best & Tyler, 2007 for Perceptual

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<sup>9</sup> Intelligibility or comprehensibility was not taken into account in Riney et al.'s (2000) study. The authors considered that reducing the degree of foreign accentedness could ultimately lead to comprehensible pronunciation (for detailed discussion, see p. 714)

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Assimilation Model-L2; Walley, 2007 for Lexical Restructuring Model). Furthermore, these crucial segmental (e.g., English /ɪ/) and suprasegmental (e.g., syllable structure) features are relatively highly responsive to instruction. Recent classroom studies have tested and confirmed the immediate effects of form-focused instruction on reducing students' error rate of these features both at a controlled and a spontaneous speech level (Saito, 2013a, 2013b; Saito & Lyster, 2012a; Couper, 2006).

Another pivotal characteristic of the teacher judgment model is that it takes into account universal problematicity of pronunciation features (Functional Load, suprasegmentals) as well as the role of L1-related pronunciation problems in speech intelligibility. For instance, some pronunciation problems specific to NJs such as cognates and assimilation problems were highly ranked in the questionnaire. Given that the L1 phonetic system exerts a relatively strong influence on L2 speech production (Flege, 2003), teachers should tailor instructional syllabi and treatment to effectively and efficiently improving students' overall intelligibility, especially when they have students with homogeneous characteristics (e.g., L1 background, age and motivation).

Intriguingly, teachers recommended teaching vowels and lexical and sentence stress as a second priority. According to the relevant literature, the target vowel sounds /æ, ʌ/ were marked as high functional load (Brown, 1988), and the melody-based suprasegmental features were found to be strongly tied to speech intelligibility (Field, 2005 for lexical stress; Hahn, 2004 for sentence stress). Unlike the similar study on the acquisition of English /ɪ/ (Saito & Lyster, 2012a), however, Saito and Lyster's (2012b) intervention experiment with a focus on the vowel acquisition found that the vowel continuum between /æ/, /ɛ/, /ɑ/, /ɔ/, and /ʌ/ is difficult for both

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students and teachers to notice. This is because vowel inventories differ widely between regional dialects of English, and mispronunciation in vowel quality tends to interfere with successful L2 communication less directly than do consonantal pronunciation errors (Jenkins, 2000). Although major pronunciation textbooks devote much space to teaching lexical and sentence stress (e.g., Celce-Murcia et al., 2010), few empirical studies seem to have tested the acquisitional value of instruction on students' actual performance with a pre- and post-test design (for a research synthesis on intervention studies, Saito, 2012). The lack of intervention research on this topic could be due to the fact that lexical and sentence stress patterns depend on regularities, but also on contextual factors; it is difficult to teach these features simply through rule-based explicit instruction (Field, 2005).<sup>10</sup>

Finally, the current study showed that cross-linguistic differences of Voice Onset Time (VOT) length in /p, t, k/ to intelligible pronunciation might not be as crucial as the other sounds such as major segmentals mentioned above (/l, ɹ, ð, θ, v/). Compared to the Japanese flap substitution error (Riney et al., 2000), Riney and Takagi (1998) found that NJs' mispronunciation of voiceless stops /p,t,k/ with respect to VOT was a relatively weak predictor for global foreign accentedness ( $r = .400-.600$ ,  $p = .02-.20$ ). This suggests that teaching accurate production of the English /l/-/ɹ/ contrast makes more immediate impact on NE listeners' successful comprehension than English stops /p, t, k/.

**Controversy.** Some parts of the results contrasted what researchers believe is important and posed questions on the construct validity of the teacher questionnaire in the current study.

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<sup>10</sup> Field (2005) recommended teaching lexical stress as a part of vocabulary instruction, because "lexical stress is specific to the individual word... the responsibility for presenting this feature falls as much on the vocabulary teacher as on the pronunciation teacher, and the oral practice of new items should include attention to their stress pattern" (p. 420).

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The most salient discrepancy is the experienced teachers' strong emphasis on the relative importance of teaching interdental fricatives /θ, ð/, as opposed to recommendations by several L2 pronunciation researchers (e.g., Jenkins, 2000). The acquisition of the interdental fricatives is a very complex phenomenon. On one hand, the interdental fricatives are hypothesized to cause little communication breakdown, due to their low functional load (Derwing & Munro, 2005). On the other hand, these sounds, which frequently occur in function words (e.g., the, this, that), are important to interlocutors. This indicates that mispronunciation of interdental fricatives might be directly related to accentness rather than to intelligibility (see Gatbonton, Trofimovich, & Segalowitz, 2011).<sup>11</sup> So, although many L2 pronunciation researchers have continued to stress the importance of selecting only pronunciation features relative to intelligibility (e.g., Derwing & Munro, 2005; Jenkins, 2000; Levis, 2005), there is a great possibility that the experienced teachers in the current study might have conflated the nativeness-intelligibility distinction: They considered interdental fricatives as important sounds due to their impact on accentedness instead of comprehensibility. This brings to light the importance of providing adequate professional training to even experienced EFL teachers, and casts doubt on the trustworthiness of teachers' intuition as a means to setting priorities for teaching intelligible pronunciation.

Another possibility is that the teachers in the current study have had a different definition of intelligible pronunciation which could better reflect the reality of Japanese EFL classrooms by taking into account both linguistic and social factors of interdental fricatives. Their students, who are likely highly-motivated adult L2 learners with great expectations for their academic as well

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<sup>11</sup> In fact, Gatbonton et al. (2011) showed that the mastery of the voiceless interdental fricative /θ/ was found to be specific to certain ESL learners who demonstrated their strong desire to belong to the English-speaking community with extra integrative and instrumental motivation.

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as career-related achievement, aim to attain intelligible pronunciation for the purpose of successful L2 communication at advanced levels. If the goal of Japanese EFL is to lead such L2 learners to achieve successful communication in future academic or business settings, it might be safe to teach interdental fricatives and to avoid any possible accent-related discrimination. Mispronunciation of these sounds is perceptually salient (regardless of its little impact on comprehensibility) and might negatively influence some interlocutors with strong negative attitudes towards foreign-accented speech (for similar discussion on the social role of foreign accentedness, see Riney et al., 2000, p. 714).

Furthermore, given that a small amount of instruction can alter L2 performance of interdental fricatives (e.g., two hours for Jamieson & Morosan, 1986), many teachers would choose this teaching topic in order to trigger students' quick and tangible improvements even under heavy time constraints in EFL settings (their students do not have much access to L2 outside of the classroom). We must wait for future research to investigate in depth the relationship between mispronunciation of interdental fricatives and communication breakdown with a controlled experimental design (cf. Deterding, 2005, p. 437).

### **NE teachers vs. NJ teachers**

The third research question asked to what degree there is agreement between NE and NJ teachers with respect to their priority judgment. The current study found that both NE and NJ teachers agreed upon the most important segmentals /l, ɹ, ð, θ, v/ and suprasegmental features (i.e., L1 effect at syllable levels), and the secondary segmentals /æ, ʌ, f/. In this respect, in line with other studies (e.g., Field, 2005; Munro et al., 2006), it is possible that both NE and NJ teachers share a consensus of what affects intelligible pronunciation in a *broad* sense (especially crucial

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sound features), which in turn suggests that general reactions towards accented speech might not differ between native and non-native speakers (Field, 2005; Munro et al., 2006).

Nonetheless, NE and NJ teachers demonstrated slightly different perceptions of intelligible pronunciation with respect to other controversial features. Whereas NE teachers attributed relative importance to diphthong and fluency problems, NJ teachers did so with assimilation rules /si, fi, ti/, stress/intonation, and the least segmentals /p, t, k, w, n, ŋ, h/. That is, it still plays a key role but in a *narrow* sense of speech intelligibility whether teachers are NEs or NJs. A close examination of their differences in the questionnaire shows that what NE teachers consider as important is intuitive in nature while what NJ teachers perceive as crucial reflects teachability. For example, enhancing fluency (when to speed up and slow down English speech with good control over pause and repetition) requires learners to alter and adapt their default rhythm patterns (mora- and syllable-timed) to the L2 system (stress-timed); its learnability and teachability has remained considerably unclear (Jenkins, 2000). It could be that, whereas fluency is considered important by NE teachers who can show models and intuitively judge the appropriateness of their students' fluency patterns, NJ teachers who have actually experienced difficulties in learning stress-timed rhythmic patterns tend not to promote teaching these rules for their students due to its questionable learnability and teachability. In contrast, NJ teachers attributed greater importance to assimilation rules and segmentals that involve simply explaining oral gestures (manner and place of articulation).

### **Conclusion and Limitation**

The current study was designed to survey experienced teachers' opinions of the ranking order of crucial pronunciation problems for NJs to acquire intelligible pronunciation. The results

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of the questionnaire noted some evidence that these teachers shared their general consensus on the problematic areas of pronunciation for NJs (i.e., their rating scores were systematic enough for the principle component analysis to identify eight problematic areas). The findings suggested a tailored syllabus specifically for NJ acquisition of intelligible pronunciation by including (a) pronunciation problems which are universally problematic in other ESL/EFL classrooms (e.g., the most important segmentals and syllable-level suprasegmentals) but also (b) sound features which are highly specific to NJs (e.g., cognates and assimilation problems). Whereas most of the teachers' pedagogical suggestions as to how NJs could be taught both segmentals and suprasegmentals follow relevant findings in L2 pronunciation research, the results of the questionnaire did note some controversy (i.e., the importance of teaching interdental fricatives), arguably because these teachers might have conflated the nativeness-intelligibility distinction or paid special attention to the high teachability of the sounds. Clearly, however, further well-designed empirical work is needed to examine not only (a) to what degree the controversial feature (i.e., interdental fricatives) impacts communicative success under controlled conditions, but also (b) the reliability of the teacher judgment especially focusing on various groups of EFL learners.

To close, several methodological problems in the current study need to be addressed. First, although the current study identified 25 pronunciation problems for NJs, other important features could have been included, such as the lax/tense distinction in English vowel sounds (i.e., /i-i/, /o-u/) (Derwing & Munro, 2005). Second, the order effect in the questionnaire might have affected the teachers' judgment (i.e., all of the teachers rated the questions in the same order). Third, the number of examples for each pronunciation feature was relatively small ( $n = 3$ ), which

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might not have allowed all of the raters to fully understand the problematicity for each pronunciation problem. Fourth, the current study exclusively drew on quantitative questionnaire methods without including any qualitative analyses; it would be intriguing to conduct individual personal interviews with a small subset of the participating teachers in order to examine in depth their opinions of intelligible pronunciation.



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Table 1. *Problematic Segmentals for NJs*

Segmental Problems	Pronunciation Problems
Vowels /æ, ʌ/	Several cross-linguistic studies have demonstrated that NJs have difficulties in perceiving and producing low front vowel /æ/ and central mid vowel /ʌ/, because Japanese has only one counterpart, low mid vowel /a/ (e.g., Nishi & Kewley-Port, 2007). As a result, they have difficulty in pronouncing minimally-paired words such as “cat vs. cut” and “fan vs. fun.”
Diphthongs /aʊ, aɪ, oʊ, ɔɪ, eɪ/	Although English diphthongs are pronounced within a single syllable, NJs tend to substitute English diphthongs with long vowels (/boot/ for /bout/) or mispronounce them with two distinguished syllables (/ca/ + /u/ for /caʊ/) (Ohata, 2004).
Approximants /w, ɹ, l/	As for the English /l/-/ɹ/ contrast, NJs tend to use the Japanese apico-alveolar flap /l/, which NEs perceive not only /l/ or /ɹ/ but also /w/ or /d/ (Sekiyama & Tohkura, 1993). As for the English /w/, NJs tend to fail to attend to an oral gesture of lip-rounding, which makes this approximate sound like Japanese unrounded high back vowel /u/.
Nasal /n, ŋ/	When NJs lower their vellums to produce /n/, they tend not to completely block airstream as much as NEs do. Similarly, when moraic nasal /ŋ/ occurs before velar stops (i.e., /k,g/), they need to be more aware of the degree of oral cavity closure (Lambacher, 1999).
Fricatives /θ, ð, f, v, h/	Japanese has only three fricative sounds /s, z, h/, resulting in difficulties for English-specific fricatives /θ, ð, f, v/. Due to two allophonic rules (i.e., /h/ → [ç] /__i, /h/ → [ϕ] /__u), it is relatively difficult for NJs to pronounce /hi/ and /hu/ respectively (Tsujimura, 1996).
Plosives /p, t, k/	NJs tend to produce English voiceless stops /p, t, k/ with relatively shorter Voice Onset Time than NEs do, resulting in ambiguity between their production of voiced stops /b, d, g/ and voiceless stops /p, t, k/ (Riney & Takagi, 1999).
Assimilation /si, ʃi, ti/	Allophonic variations (/s/ → [ʃ] /__i, /t/ → [tʃ] /__i) put NJs at a disadvantage as they encounter difficulties in pronouncing /si/ and /ti/ respectively (Riney & Anderson-Hsieh, 1993). In addition, NJs have difficulties in producing lip-rounding features in English /f/ (Tsujimura, 1996).

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Table 2. *Problematic Suprasegmentals for NJs*

<u>Suprasegmental Problems</u>	Pronunciation Problems
Word stress	Field (2005) showed that the misallocation of lexical stress negatively impacts both NE and NNE listeners. Furthermore, stress realization between English and Japanese is different. Whereas stressed syllables are produced with longer and louder vowels in English, stressed syllables are pronounced with higher pitch in Japanese (Gimson, 1989; Tsujimura, 1996, Vance, 1987).
Sentence stress	Hahn (2004) demonstrated that the absence and misallocation of sentence stress negatively influences NE listeners. In Japanese, stress is realized with high pitch at lexical levels rather than sentence levels, which makes NJs' speech sound "monotonous" and "flat" (Gimson, 1989; Tsujimura, 1996; Vance, 1987).
Intonation	Jenkins (2000) cast doubt on the teachability/learnability of intonation, especially in the context of English as International Language. For example, although most of textbooks and teaching materials suggest that "yes/no" questions have rising tones, Levis (1999) conducted a corpus analysis of natural NE speech samples, finding that yes/no questions do not always have rising intonation.
Speech rate	Munro and Derwing's (2001) experimental studies suggested that speeding up 110 % of NNE speech might facilitate comprehensibility.
Fluency	Silent and non-lexical (e.g., uh, oh) pauses are characteristics of extemporaneous NNE speech, and they tend to negatively influence listeners' scalar L2 comprehensibility judgments (Derwing, Rossiter, Munro, & Thomson, 2004).
Syllabification	Due to the fact that Japanese is a mora-timed language, NJs tend to pronounce each syllable with equal stress, which lead NJs to have difficulties in producing complex syllables allowed in English such as CCVC, CCVCC and CCCVCC (Ohata, 2004). In EIL contexts, Jenkins (2000) pointed out that NNEs tend to simplify word-initial and word-medial consonant clusters by deleting consonants or adding epenthesis vowels, suggesting that simplification with deletion interferes with comprehensibility more than simplification with addition (see also Lin, 2003).
Cognates	As one of writing systems, Japanese has Katakana in which English words are borrowed and adapted within Japanese phonetic system (e.g., /terebi/ for "TV" and /konpjyutar/ for "computer"; see more examples, Tsujimura, 1996). It is well known that NJs tend to continue to use Katakana English, resulting in a lot of confusion (Riney & Anderson-Hsieh, 1993).
Contraction	In general, NNEs have problems in producing and perceiving contraction forms in English such as "can't" and "won't" (Gimson, 1989).



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Table 3. *Ranking and Loading for Principle Component Analysis*

	Factors (% of variance)								Individual Features		Factors	
	1 (12.9%)	2 (12.4%)	3 (8.6%)	4 (8.1%)	5 (7.1%)	6 (7.1%)	7 (6.4%)	8 (4.6%)	Mean	SD	Mean	SD
<i>1. Major segmentals</i>												
/r/ (e.g., <u>r</u> ock, <u>r</u> ight, <u>r</u> ead)	<b>0.80</b>	0.10	0.01	0.12	0.23	0.02	-0.15	0.02	1.33	0.64		
/l/ (e.g., <u>l</u> ock, <u>l</u> ight, <u>l</u> ead)	<b>0.81</b>	0.20	0.02	0.03	0.17	0.07	0.05	0.13	1.38	0.66		
/θ/ (e.g., <u>th</u> ink, <u>th</u> ing, <u>th</u> ick)	<b>0.76</b>	-0.03	0.30	0.31	-0.05	0.07	0.15	-0.13	1.35	0.67		
/v/ (e.g., <u>v</u> ery, <u>v</u> ase, <u>v</u> oice)	<b>0.54</b>	-0.04	0.41	0.33	0.17	0.23	0.04	0.16	1.48	0.69		
/ð/ (e.g., <u>th</u> is, <u>th</u> at, <u>alth</u> ough)	<b>0.71</b>	0.15	0.16	0.14	-0.07	0.12	0.16	-0.09	1.50	0.77		
											1.43	0.86
<i>2. L1 effect at syllable levels</i>												
Syllabification	0.23	0.16	0.03	-0.06	<b>0.84</b>	0.13	0.03	-0.09	1.64	0.98		
Cognates	0.04	-0.07	-0.02	0.16	<b>0.88</b>	0.08	0.02	-0.01	1.67	0.92		
											1.65	0.85
<i>3. Assimilation problems</i>												
/sɪ/ (e.g., <u>s</u> ip, <u>s</u> it, <u>s</u> ick)	0.17	0.13	-0.06	<b>0.83</b>	-0.01	-0.07	0.04	-0.10	1.63	0.89		
/ʃɪ/ (e.g., <u>sh</u> ee <u>p</u> , <u>sh</u> ee <u>t</u> , <u>sh</u> ip)	0.19	0.02	0.05	<b>0.76</b>	0.08	0.19	-0.02	0.10	1.73	1.03		
/tɪ/ (e.g., <u>t</u> icket, <u>t</u> eam, <u>t</u> ip)	0.20	0.23	0.26	<b>0.43</b>	0.13	0.12	0.08	-0.57	2.09	1.05		
											1.82	1.01
<i>4. Stress/intonation problems</i>												
Word Stress	0.17	0.01	0.34	0.16	0.24	<b>0.58</b>	-0.02	0.01	1.73	0.88		
Intonation	0.11	0.07	0.09	0.05	0.03	<b>0.73</b>	0.22	0.10	2.17	0.94		
Sentence Stress	0.02	0.36	-0.03	0.01	0.10	<b>0.65</b>	0.14	-0.24	2.37	1.00		
											2.09	0.98

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5. Secondary segmentals

/ f / (e.g., <u>f</u> ee <u>t</u> , <u>f</u> all, <u>f</u> ill)	0.23	0.32	<b>0.46</b>	0.40	0.15	0.13	-0.01	0.17	1.84	0.93
/ æ / (e.g., <u>m</u> an, <u>h</u> at, <u>a</u> pple)	0.20	0.02	<b>0.77</b>	0.00	-0.01	0.28	-0.03	-0.08	2.22	1.08
/ ʌ / (e.g., <u>c</u> ut, <u>d</u> uck)	0.09	0.24	<b>0.78</b>	-0.06	-0.07	-0.03	0.15	0.02	2.59	1.10

2.22 1.08

6. Diphthong problems

Diphthongs /aʊ, aɪ, oʊ, oɪ, eɪ/	0.16	0.41	0.19	0.17	-0.07	0.02	0.19	<b>0.64</b>	2.40	0.96
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2.40 0.97

7. Minor segmentals

/ w / (e.g., <u>w</u> hat, <u>w</u> hen, <u>w</u> ood)	0.19	<b>0.59</b>	0.09	0.18	-0.18	0.24	0.03	0.14	2.26	1.13
Contraction (e.g., won't, can't)	0.00	<b>0.61</b>	0.17	0.00	0.07	-0.11	0.27	-0.29	2.65	1.07
/ ɪŋ / (e.g., <u>pl</u> aying, <u>ki</u> ng, <u>so</u> ng)	0.39	<b>0.56</b>	0.11	-0.03	-0.01	-0.03	0.13	0.21	2.72	1.08
/ h / (e.g., <u>h</u> ear, <u>h</u> all, <u>h</u> ill)	0.06	<b>0.56</b>	0.41	0.18	0.09	-0.15	0.13	0.24	2.73	1.03
/ n / (e.g., <u>n</u> eat, <u>n</u> eck, <u>p</u> attern)	0.14	<b>0.76</b>	0.04	-0.03	-0.01	0.26	-0.22	-0.10	2.84	1.17
/ p, t, k / (e.g., <u>p</u> itch, <u>t</u> all, <u>c</u> all)	-0.01	<b>0.73</b>	0.01	0.09	0.12	0.12	-0.01	0.04	3.04	1.08

2.71 1.11

8. Fluency problems

Fluency	0.12	-0.03	-0.01	-0.05	0.07	0.24	<b>0.75</b>	0.06	2.25	0.94
Speech Rate	0.02	0.10	0.11	0.07	-0.02	0.05	<b>0.81</b>	0.00	3.27	1.03

2.76 1.11

## PRIORITIES FOR IMPROVED PRONUNCIATION

### APPENDIX: The questionnaire used for the current study

#### Background

It has been always controversial which pronunciation features are important and should be taught in pursuit of NOT accent-free speech BUT intelligible pronunciation. We know typical pronunciation problems of Japanese learners of English. But, we don't know which ones should be weighed and prioritized for the purpose of effective pronunciation instruction. Please give us your expert advice by rating each item presented below in terms of how important these items are for teaching and improving Japanese learners' intelligible pronunciation.

#### Instruction

Rating scale is 5-point (1: very important to teach - 5: not very important to teach). Our interest is which *pronunciation features* are important; contextual cues such as talkers' gestures or listeners' familiarity to topics are not considered in this research.

#### Part 1. Individual Sound

Q. How important do you think is it to teach the individual sound for intelligible pronunciation?

1. / æ / (e.g., man, hat, apple)

( 1.            2.            3.            4.            5. )  
 Very important                      Neutral                      Not very important

2. / ʌ / (e.g., cut, duck)

( 1.            2.            3.            4.            5. )  
 Very important                      Neutral                      Not very important

3. Diphthongs / aʊ, aɪ, oʊ, ɔɪ and eɪ/ (e.g., cow, lie, saw, boy, cake)

( 1.            2.            3.            4.            5. )  
 Very important                      Neutral                      Not very important

4. / w / (e.g., what, when, wood)

( 1.            2.            3.            4.            5. )  
 Very important                      Neutral                      Not very important

5. / r / (e.g., rock, right, read)

( 1.            2.            3.            4.            5. )  
 Very important                      Neutral                      Not very important

6. / l / (e.g., lock, light, lead)

( 1.            2.            3.            4.            5. )  
 Very important                      Neutral                      Not very important

7. / n / (e.g., neat, neck, pattern)

( 1.            2.            3.            4.            5. )  
 Very important                      Neutral                      Not very important

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8. / ŋ / (e.g., playng, king, song)

(	1.	2.	3.	4.	5.	)
	Very important		Neutral			Not very important

9. / p, t, k / (e.g., pitch, tall, call)

(	1.	2.	3.	4.	5.	)
	Very important		Neutral			Not very important

10. / sɪ / (e.g., sip, sit, sick)

(	1.	2.	3.	4.	5.	)
	Very important		Neutral			Not very important

11. / ʃɪ / (e.g., sheep, sheet, ship)

(	1.	2.	3.	4.	5.	)
	Very important		Neutral			Not very important

12. / ti / (e.g., ticket, team, tip)

(	1.	2.	3.	4.	5.	)
	Very important		Neutral			Not very important

13. / θ / (e.g., think, thing, thick)

(	1.	2.	3.	4.	5.	)
	Very important		Neutral			Not very important

14. / ð / (e.g., this, that, although)

(	1.	2.	3.	4.	5.	)
	Very important		Neutral			Not very important

15. / f / (e.g., feet, fall, fill)

(	1.	2.	3.	4.	5.	)
	Very important		Neutral			Not very important

16. / v / (e.g., very, vase, voice)

(	1.	2.	3.	4.	5.	)
	Very important		Neutral			Not very important

17. / h / (e.g., hear, hall, hill)

(	1.	2.	3.	4.	5.	)
	Very important		Neutral			Not very important

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**Part 2. Beyond Individual Sounds**

1. Word Stress (e.g., deSSERT vs. DEsert)

( 1.            2.            3.            4.            5. )  
 Very important            Neutral            Not very important

2. Sentence Stress (e.g., HE studied yesterday vs. he STUDIED yesterday)

( 1.            2.            3.            4.            5. )  
 Very important            Neutral            Not very important

3. Intonation (e.g., Does he want to eat it?<sup>↗</sup> What do you think?<sup>↘</sup>)

( 1.            2.            3.            4.            5. )  
 Very important            Neutral            Not very important

4. Speech Rate (e.g., if Japanese learners speak faster, could their speech be more intelligible?)

( 1.            2.            3.            4.            5. )  
 Very important            Neutral            Not very important

5. Fluency (e.g., speak with few or too many pauses, false starts, repetitions and hesitations)

( 1.            2.            3.            4.            5. )  
 Very important            Neutral            Not very important

6. Syllabification: Japanese learners frequently put vowels after consonants

(e.g., I want[O] s[U]peak[U] Eng[U]lish[U])

( 1.            2.            3.            4.            5. )  
 Very important            Neutral            Not very important

7. Cognates: Japanese learners continue to use KATAKANA pronunciation for English words

(e.g., アップル for “apple”, レストラン for “restaurant”, テーブル for “table”)

( 1.            2.            3.            4.            5. )  
 Very important            Neutral            Not very important

8. Contraction (e.g., won't, can't, could've, might've)

( 1.            2.            3.            4.            5. )