早稲田大学教育学部　学術研究（英語・英文学編）第53号　1－22ページ，2005年2月

The Effectiveness of a *Prosody-oriented Approach* in L2 Perception and Pronunciation Training

Mamiko Akita

1. Introduction

1.1 The Effectiveness of Explicit Instruction in L2 prosody

According to Bongaerts, Summeren, Planken & Schils (1997), the task of second language (L2) learners can be simplified by providing them with input enhancement in the form of perceptual training aimed at focusing their attention on subtle phonetic contrasts between their first language (L1) and the target language (TL). This can be followed by training learners in the production of L2 speech sounds in order to develop the finely tuned motor control requirements of accurate pronunciation. This is in accordance with Flege's (1987, 1995) studies arguing that foreign accents are largely perceptually based and to learn a new language one needs to shift from the L1 tuned phonetic categories to that of TL.

Moreover, it has been argued since the 80's that emphasis on raising L2 ***prosodic*** awareness by encouraging learners to concentrate on the cues helps them to interpret spoken sentences (see de Bot & Mailfert, 1982; Chun, 1988).

Among one of the relatively recent studies, Moyer (1999) found a significant relationship between the outcome and the type of phonological feedback given: subjects who were given both suprasegmental (= prosody) and segmental feedback scored closer to native speakers in a predictably constant relationship. Twenty-four highly proficient adult English learners of German were studied. All the subjects were exposed to German after the age of ten and were presumed to be highly motivated due to their extensive use of German in the course of teaching, studying, and research. A background questionnaire identified and grouped variables under the following categories: (1) biological variables (age of immersion, age of instruction); (2) instructional variables (years of instruction, years of teaching, years of immersion, amount of phonological feedback, type of feedback [segmental,

suprasegmental, or both]); (3) affective variables (type of motivation, self-evaluations of pronunciation, attitude toward pronunciation, self-evaluation of cultural and linguistic assimilation while immersed in the TL environment).

Subjects were asked to read (1) a list of twenty-four words; (2) a list of eight sentences; (3) a paragraph of text; and also (4) to participate in a free response section in which they were free to choose any one of the five possible topics and speak at least five to ten sentences. Four native speakers (NS) volunteered to act as raters and listen to the speech samples of each talk to determine whether the speaker was a native German. Each subject (NNS) was rated by two judges. Each judgment was accompanied by a confidence rating (very confident, fairly confident, and not confident). When applied to the binary judgment (NS vs. NNS), this resulted in a 6-point scale of judgment (1 = definitely nonnative; 2 = probably nonnative; 3 = maybe native .... 6 = definitely native). These individual 6-point ratings were then averaged for both judges who listened to all the four speech tasks and a mean rating across tasks was assigned to each speaker based on the overall average.

It was found that the higher the age of immersion and instruction, the higher the mean rating (lower accuracy). It was also found that the higher the category for phonological feedback (indicating suprasegmental as well as segmental feedback) the lower the mean rating (greater accuracy). Since those who had received stress, rhythm, and intonation training or feedback scored significantly closer to the native range than those who did not, Moyer concluded that the type of feedback rather than the amount is significant for acquiring native-level pronunciation.

Pennington & Ellis (2000) also suggest that an emphasis on raising L2 prosodic awareness may help the L2 learners analyze the TL prosody as a "representational system". They examined the performance of advanced Cantonese speakers of English on recognition memory for English sentences wherein prosody was the discriminating feature in otherwise identical sentence pairs. Although the speakers' memory for English sentences based on prosodic information was generally poor, after the learners were explicitly directed to pay attention to intonation, significant improvement was observed for sentences in which prosody signaled a marked information focus ('contrastive stress') versus an unmarked one ('neutral' sentence intonation).

In their study, thirty advanced Cantonese speakers of English completed two experiments conducted in a sequence: untutored (implicit) condition [Experiment 1] followed by a tutored (explicit) condition [Experiment 2]. Each experiment consisted of a *study phase* followed by a *recognition task*. The recognition task in the two experiments were identical, and

the subjects were required to listen to forty-eight sentences and decide whether or not each sentence they heard was exactly the same as one of the sentences they had heard in the previous study phase.

In Experiment 1, subjects demonstrated a high level of lexical memory in their ability to recognize previously heard sentences and identify new ones. However, they were poor at identifying sentences having the same lexis such as previously heard sentences spoken with different intonation. Pennington & Ellis argued that learners did not pay attention to the phonological information of the L2 and they did not have the relevant knowledge to determine how intonation resolves ambiguity; thus, their judgment depended solely on lexical information. The recognition phase of Experiment 2 revealed that subjects' memory for previously heard sentences with new prosody could be improved to some extent through explicit instruction.

They maintain that emphasis on raising L2 prosodic awareness may help the L2 learners analyze the TL prosody as a "representational system" along with that of other systems of grammar.

Moreover, since perception training has been shown to facilitate production skills (Bradlow, Pisoni, Yamada & Tohkura, 1997), it seems reasonable to argue that explicit instruction in prosody is essential. Furthermore, such explicit instruction could be effective in another manner: it may act as a facilitator to raise learners' consciousness of their pronunciation accuracy. Studies show that among a range of exposure and attitudinal variables, concern for pronunciation accuracy was one of the most significant factors in developing L2 phonology (Suter, 1976).

However, although the importance of explicit training in rhythm and stress patterns was acknowledged by researchers, it has generally been ignored in L2 classroom teaching (Leather, 1983; Pennington, 1989; Morley, 1994). This indicates the need to re-evaluate such approaches; and to determine the best approach for teaching pronunciation. It is also necessary to further investigate the nature of the phonological problems with a specific L1 example and suggest what should be included in the teaching program, how it should be presented, and thus empirically test the methods to develop the most effective pronunciation teaching program for learners.

Given that all the subjects of this study are Japanese citizens, I would like to add a few words concerning the English teaching situations in Japan. The new 'foreign language teaching scheme' ('shin kyouiku youkou') for junior/high schools published by the Ministry of Education ('Monbusho') in 1997 emphasizes the importance of improving oral skills - an

area which has long been neglected while focusing on reading, translating, and vocabulary skills. Although the importance of oral skills in foreign language teaching has finally been acknowledged and classes dedicated to listening/speaking skills have been scheduled, the teachers in such classes are largely left on their own without any support tools. As a result, the teachers may be using the time for general listening-comprehension without focusing on the phonological features of English.

1.2 Teaching Programs on Pronunciation

Morley (1994), Gilbert (1987, 1995), and Pennington (1989, 1998) are among the few who discussed the content and presentation of a teaching program on pronunciation. While Morley (1994) claimed that pronunciation teaching should be an integral part of teaching communication, Gilbert (1995) and Pennington (1998) argued that a focused program on pronunciation teaching is desirable. Celce-Murcia, Brinton & Godwin (1996), on the other hand, developed a curriculum design for specific purposes. Although they had different views on the methods of teaching, all of them emphasized the importance of including prosody in the curriculum. However, another factor common to the authors was that they failed to provide quantitative data to support their views.

Morley (1994) emphasizes the importance of including suprasegmentals in a teaching program. She proposes that pronunciation teaching should be included in L2 curriculum as an integral part of teaching communication and should not be taught as a separate subject. She outlines the features and summary descriptions as well as the expected impact on learners' communication through her *Dual-Focus Program* (*Integrated Approach*). She also elaborates on the curriculum guidelines for instructional planning and assessment. While she acknowledges the importance of and the difficulty in proving the credibility of a teaching program, she failed to provide empirical data in her paper.

Gilbert maintains (1995) that pronunciation practice helps to improve learners' listening comprehension. Citing Brown (1992) and Morley (1991), she argues that listening comprehension and pronunciation ability are interrelated: learners cannot process grammatical or discourse cohesion (e.g., thought group serving as a navigation guide for listeners, (p.101)) because they are not trained to make use of them in the TL. She also argues that instruction in prosody (*prosody-oriented approach* in this study) helps learners improve their perception more effectively rather than traditional pronunciation training (*segmental-oriented approach* in this study); the latter usually focuses on minimal-pair drilling of individual sounds. Gilbert discussed the content and presentation of her teaching program, citing

techniques and examples from her workbook for students and teachers (1993a, 1993b). She proposes that while various aspects of pronunciation are interdependent, it is preferable to teach one aspect at a time. She suggests that the following topics should be included in the curriculum design: (1) rhythm at the word level (syllable number & word stress), (2) thought group, (3) sentence emphasis (baseline pattern & focus words), (4) individual sounds (1993, p. 98). She concludes that practice in the abovementioned aspects of phonology can enhance perception as well as intelligibility in production.

Pennington (1998, p. 328) also argued that the training would be most effective if it were a "focused program in isolation from other skills" and if "the program involves perceptual training such as audio and video feedback. However, she too did not provide quantitative data to support her view.

In a reference book for teachers of TESOL, Celce-Murcia, Brinton, & Goodwin (1996) present the knowledge and various teaching tools that TESOL teachers require to address the pronunciation issues faced by their students. This includes suggestions for exercise activities and accompanying sample worksheets. They also devote a chapter to developing and designing a language curriculum for various learners. Each case study describes the objective of the course and the selection, arrangement, and presentation of the syllabus (e.g., one-on-one instruction of a Japanese businessman, Italian middle school students). Their book is valuable in that it provides practical suggestions for teaching pronunciation in various teaching situations. However, they do not offer supports for their suggested syllabuses.

While the aforementioned studies argued the importance and effectiveness of pronunciation teaching, Yule & Macdonald (1994) and Macdonald, Yule, & Powers (1994) found that the individual learner could be a more powerful variable than the method of instruction. They concluded that there is no single way by which the effects of pronunciation teaching can be observed. In a pretest-treatment-posttest design study involving twenty-three advanced ESL learners of Chinese, they tape-recorded subjects' production on three occasions, i.e., immediately before, immediately after, and two days after the instructional period. In each test, subjects were asked to make a presentation on a given topic, which was then evaluated by native judges. The subjects had been exposed to one of the following four instructional practices: (1) teacher-directed drill activity with corrective feedback, (2) individually conducted language laboratory activity, (3) clarification questions from the teacher after subjects' oral presentation, (4) revision of their presentation materials in silence, without instruction. None of the results appeared to prove the superiority of one teaching method over the other since no statistically significant difference was observed among

groups. I suspect that this was because the length and amount of instruction was not sufficient to induce a change in subjects' interlanguage phonology. As discussed by the abovementioned researchers, articulation of single vocabulary items is a minor component of an individual's phonology, and the outcome may have been different if rhythm and intonation were taken into account.

As discussed, few pedagogically oriented studies have compared the effectiveness of the different teaching methods (except for example, Champagne-Muzar, Schneiderman & Bourdages, 1988; Ueno, 1998) and majority of the previous studies were conducted (1) outside regular classrooms, (2) with small-scale laboratory training, or (3) focusing merely on *segmental* training as pointed out in Murakawa (1981) and de Bot et al. (1982). Furthermore, most studies have focused on only one aspect of phonology (e.g., phonemes, syllable structure) without examining the inter-relationship of the aspects in phonology as pointed out in Akita (2001).

The present study was conducted in a regular classroom setting to compare the changes in the perceptual and production abilities of Japanese English learners, as a result of two instructional procedures: ***segmental-oriented approach*** and ***prosody-oriented approach.*** It also investigates which aspects of phonology (e.g., assimilation, deletion) are most affected by explicit instruction on segments/prosody.

In accordance with Pennington (1998) and Gilbert (1995), the two instructional procedures shared the following features: (1) a focused program on pronunciation teaching, with (2) various aspects taught one step at a time, as well as (3) perceptual training. I also included a control group that was not present in Ueno's (1998) study.

2. Methodology

Sixty-four first year students from a Japanese university participated in a *pretest-treatment-posttest* design study. The subjects took two tests, namely, perception and production. In the production test, subjects were asked to read out test sentences in a sound-treated room. Both the pretest and posttest were conducted, evaluated, and scored by the investigator with the help of a postgraduate research assistant who majored in Applied Linguistics. A dictation test was conducted to test the learners' perceptual abilities. Both tests consisted of 30 sentences each, which included six aspects of phonology, with five sentences for each aspect. Examples of test sentences are listed in Table 1.

Table 1

Aspects of Phonology Tested and Examples of Test Sentences

Aspects	Examples
Phone (phoneme distinctions; 2 Vs 3 Cs)	We'll [send/sand] it carefully.
Rhythm (especially reduction)	Get it from the kitchen.
Deletion	He grabbed the money.
Assimilation	Is she your mother?
UEP (unexploded plosives)	Can I have the white tie, please?
Linking	How did you come about?

There were two treated groups - the ***segmental group*** (N=23) and the ***prosody group*** (N=24) - and one ***control group*** (N=17) as shown in Table 2.

Table 2

Types of Experimental Groups and Tests

Experimental groups	Perception		Production	
	Pretest	Posttest	Pretest	Posttest
Control (CG) (N = 17)	CG-PER-pre	CG-PER-post	CG-PRO-pre	CG-PRO-post
Segmental (SG) (N = 23)	SG-PER-pre	SG-PER-post	SG-PRO-pre	SG-PRO-post
Prosody (PG) (N = 24)	PG-PER-pre	PG-PER-post	PG-PRO-pre	PG-PRO-post

During the four-month treatment (90 minutes × 12 sessions), identical teaching material was used for each group to standardize the input received by the subjects. Furthermore, the basic teaching procedures were identical for all three groups - listening comprehension exercises, dialog practice, and role playing.

The only treatment difference among the groups was that the ***prosody group*** received prosody-focused instruction on syllable structure, stress, reduction etc., while the ***segmental***

group received training to discriminate and articulate individual sounds, e.g., [r] vs. [l]. The control group participated in extra conversation exercises as shown in Table 3.

Table 3

Treatment for the Three Experimental Groups

Experimental groups	Treatment specific to each group
Control	Extra conversation exercises
Segmental	Instruction on phonemes (discrimination and articulation)
Prosody	Instruction on syllable structure, stress, and reduction

3. Results

3.1 Difference Among Groups

Since the subjects were not randomly selected, the Kruskal-Wallis Test, a nonparametric equivalent to the one-way between-groups ANOVA, was performed to compare the three groups in order to determine whether there was a significant difference among the groups. It must be noted that the level of improvement is indicated by the number of asterisks in the tables: the significance level of $p < 0.05$ = *, $p < 0.01$ = **, $p < 0.001$ = ***, and (ns) = not significant.

Regarding perceptual abilities, no significant differences were observed among the groups either in the pretest or the posttest as shown in Table 4. On the other hand, for the production abilities in the posttest phase, a significant difference was observed among the groups.

Table 4

Comparisons Among the Three Experimental Groups

Type of test	Test phase	P value
Perception	Pretest	P = 0.8069 (ns)
	Posttest	P = 0.6746 (ns)
Production	Pretest	P = 0.1102 (ns)
	Posttest	P < 0.0001***

Regarding production abilities in the posttest phase, Dunn's multiple comparison test was employed to determine the precise location of the differences among groups. It was found that the ***prosody group*** and the other two groups were significantly different as shown in Table 5.

Table 5

Dunn's Multiple Comparison Test for Production (Posttest)

Experimental groups	P value
Control vs. Segmental	P > 0.05 (ns)
Control vs. Prosody	P < 0.001***
Segmental vs. Prosody	P < 0.001***

3.2 Changes in Each Experimental Group

The performance of the three experimental groups was then compared. Wilcoxon matched-pairs signed-ranks test (two-tailed), a nonparametric repeated-measures test, was performed to evaluate the degree of changes as well as the direction of the differences.

Regarding perceptual abilities, all three groups exhibited significant improvement, as shown in Table 6 and Figure 1.

In the posttest phase of the production abilities, while the control group did not exceed

Table 6

Significance Levels of Perceptual Abilities: Pretest vs. Posttest

Experimental groups	P value
Control	P = 0.0005***
Segmental	P < 0.0001***
Prosody	P < 0.0001***

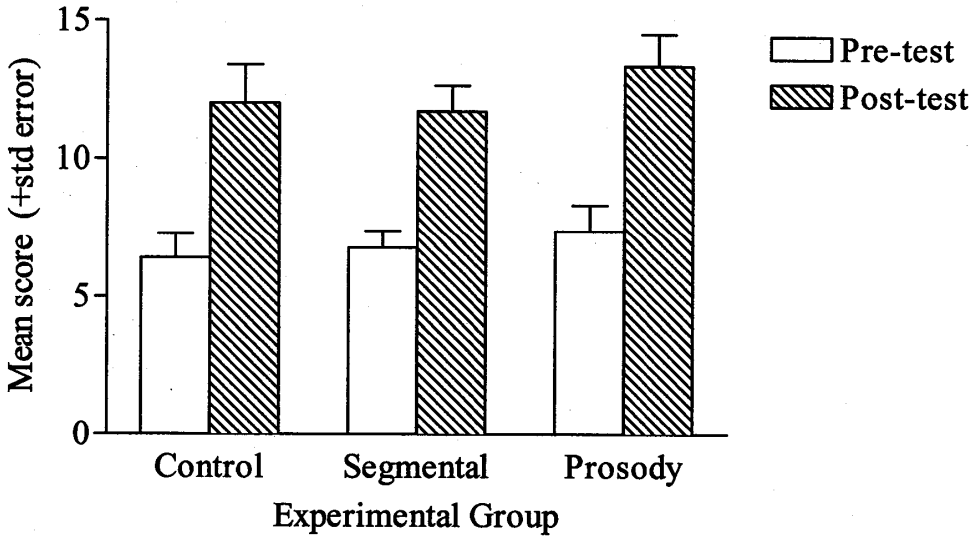

Figure 1. Improvement in perception abilities: Pretest vs. Posttest.

the significance level of $p < 0.05$, the other two groups exhibited significant improvement as shown in Table 7 and Figure 2.

Table 7

Significance Levels of Production Abilities: Pretest vs. Posttest

Experimental groups	P value
Control	P = 0.6492 (ns)
Segmental	P = 0.0003 ***
Prosody	P < 0.0001 ***

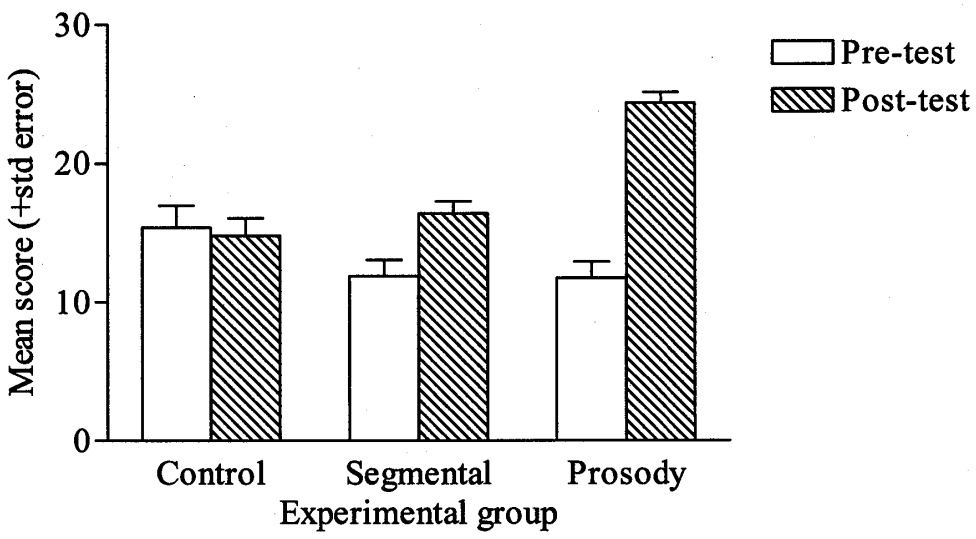

Figure 2. Improvement in production abilities: Pretest vs. Posttest.

3.3 Analysis of Six Tested Aspects

Difference Among Groups

The difference among the groups for six aspects of phonology was further analyzed. It was found that the result was a repetition of those of the total score for both tests, which have been reported in the previous sections. There were only two exceptional cases, i.e., *deletion* and *phone* in production abilities, which will be detailed in the next section.

The Kruskal-Wallis Test was performed to determine whether there was a significant difference among the three groups for each aspect of phonology tested. Regarding perceptual abilities, no significant differences were observed among groups either in the pretest or in the posttest phase (see Table 8). Regarding production abilities in the pretest phase, there was a significant difference among groups for *deletion* as shown in the third row of Table 8. This is discussed in the next section. A significant difference among groups was observed in the posttest phase (Table 8).

Table 8

Comparisons Among the Groups According to Aspect and Test Type

	Perception		Production	
	Pretest	Posttest	Pretest	Posttest
Phone	0.9750 (ns)	0.1116 (ns)	0.3099 (ns)	0.0065**
Rhythm	0.9057 (ns)	0.7829 (ns)	0.4682 (ns)	<0.0001***
Deletion	0.5563 (ns)	0.0660 (ns)	0.0001***	0.0002***
Assimilation	0.6712 (ns)	0.8550 (ns)	0.5404 (ns)	<0.0001***
UEP	0.2244 (ns)	0.4585 (ns)	0.2825 (ns)	0.0003***
Linking	0.7804 (ns)	0.8942 (ns)	0.8056 (ns)	<0.0001***

Regarding production abilities in the posttest phase, Dunn's multiple comparison test was employed to determine the precise location of the differences among groups. It was found that the ***prosody group*** and the other two groups were significantly different as shown in Table 9.

Table 9

Dunn's Multiple Comparison Test for Production Abilities (Posttest)

	Control vs. Segmental	Control vs. Prosody	Segmental vs. Prosody
Phone	>0.05 (ns)	<0.05*	<0.05*
Rhythm	>0.05 (ns)	<0.001***	<0.001***
Deletion	>0.05 (ns)	<0.01**	<0.01**
Assimilation	>0.05 (ns)	<0.001***	<0.01**
UEP	>0.05 (ns)	<0.01**	<0.01**
Linking	>0.05 (ns)	<0.001***	<0.001***

Changes Per Aspect

The performance of the three experimental groups for each aspect of phonology was then compared. Wilcoxon matched-pairs signed-ranks test (two-tailed), a nonparametric repeated-measures test, was performed to evaluate the degree of changes as well as the direction of the differences.

Regarding perceptual abilities, all three groups exhibited significant improvement as shown in Table 10, except the segmental group for *deletion.*

Table 10

Gradual Changes in Perceptual Abilities per Aspect

	Control	Segmental	Prosody
Phone	0.0156*	0.0011**	0.0002***
Rhythm	0.0098**	0.0002***	0.0004***
Deletion	0.0049**	0.1602(ns)	0.0005***
Assimilation	0.0001***	0.0050**	0.0007***
UEP	0.0234*	0.0034**	0.0030**
Linking	0.0012**	0.0015**	0.0003***

In the posttest phase of the production abilities, the control group did not exceed the significance level of $p < 0.05$ in most aspects. On the other hand, the segmental group exhibited significant improvement in four aspects, while the prosody group exhibited significant improvement in all the six aspects as shown in Table 11. The general pattern of the prosody group outperforming the other two groups did not change.

Table 11

Gradual Changes in Production Abilities per Aspect

	Control	Segmental	Prosody
Phone	0.8457(ns)	0.6575(ns)	0.0003***
Rhythm	0.1641(ns)	0.0580(ns)	<0.0001***
Deletion	0.0322*	0.0001***	<0.0001***
Assimilation	0.2324(ns)	0.0076**	<0.0001***
UEP	0.7695(ns)	0.0037**	0.0001***
Linking	0.0398*	0.0018**	<0.0001***

Two Unexpected Results

Deletion in production. The results for deletion in the production test show that the effect of explicit instruction was robust and consistent. In the pretest phase, the control group had a higher mean score compared to the other two groups (see Table 12 and Figure 3). However, in the posttest phase, the two treated groups had a higher score compared to the control group (see also Table 8 and Table 9). This shows that the treated groups (segmental group and prosody group) were able to counter the low pretest performance in the posttest phase due to the effects of explicit instruction.

Table 12

Results of the Dunn's Multiple Comparison Test for Deletion in the Pretest Phase

Experimental groups	P value
Control vs. Segmental	<0.01**
Control vs. Prosody	<0.001***
Segmental vs. Prosody	>0.05 (ns)

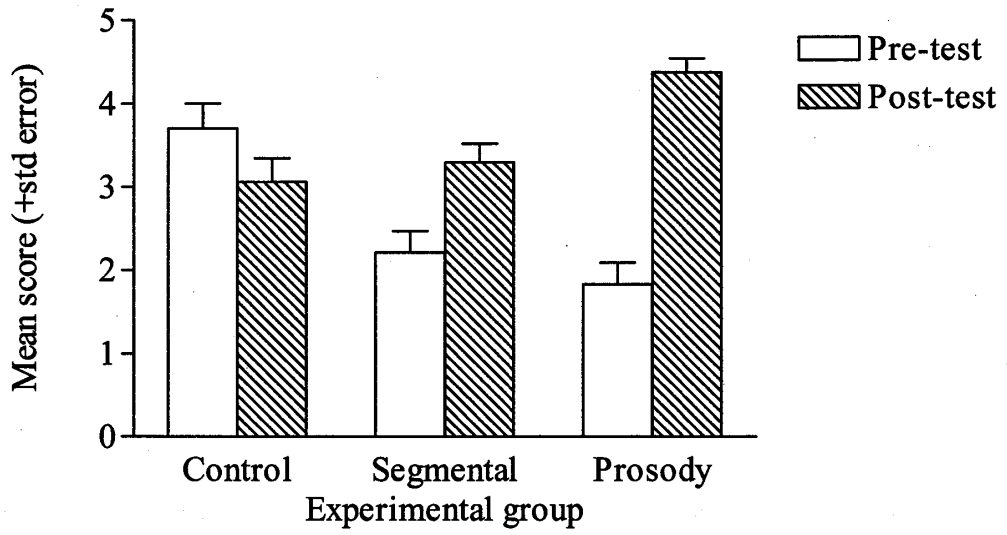

Figure 3. Comparison of deletion scores in the production test: pretest vs. posttest.

Phone (phoneme distinctions) in production. The prosody group was the only group which exhibited improvement for phoneme distinctions as shown in Table 11. This is particularly interesting because the segmental group, which received instructions on discriminating and articulating phonemes, did not show any improvements; though instructions on prosody helped learners improve their ability to discriminate and articulate phonemes, in addition to other aspects of phonology.

4. Discussion

4.1 Summary of the Results

This study compared the changes in the perceptual and production abilities of Japanese English learners, as a result of two instructional procedures, namely, the ***segmental-oriented approach*** and ***prosody-oriented approach.*** It also investigated various aspects of phonology that was affected by explicit instruction on segments/prosody.

We first examined the total scores of the data. Regarding perceptual abilities, all three groups exhibited an improvement as shown in Table 6. This result was partially expected because all three groups were given the same listening comprehension exercises as assignments and linguistic input; therefore, they had an equal chance of improving their perceptual abilities.

The results might also indicate that production training has little influence on learners' perceptual abilities because the two groups that received training in production abilities (i.e.,

the segmental group and the prosody group) negligibly outperformed the control group. However, one might also argue that if the amount of production training increases, the learners' perception as well as production abilities will be affected. Results from the present study did not support the view that perception training facilitates production skills as was argued by Bradlow, Pisoni, Yamada & Tohkura (1997). This aspect requires further research.

Regarding production abilities, only the segmental and prosody groups exhibited improvement, as shown in Table 7. Furthermore, as shown in Table 5, the prosody group outperformed the segmental group in the posttest phase of the production test.

In addition, on examining the data for phones, the effectiveness of instructions on prosody was evident in the production data: the prosody group was the only group that exhibited improvement for phoneme distinctions. Despite receiving instructions on discriminating and articulating phonemes, the segmental group did not show any improvement.

4.2 Limitations and Future Objectives

Several factors may have affected the outcome of the study. To begin with, the testing methods employed in the production/perception test are questionable. Since the subjects were asked to read out test sentences, they could have learned what was being investigated from the list; this may have allowed the subjects to pay close attention to the target structures. However, since the author aimed to investigate different aspects of phonology, a sizable amount of target structure needed to be included in the test. Therefore, asking the subjects to read out a list was considered to be the most suitable technique. Besides, since all subjects were asked to perform the same test, the emerged pattern of the results was not expected to change. One may also argue that the number of test sentences per aspect was extremely limited, with only five sentences per aspect and 30 sentences in total. Since the test was conducted individually during class hours, this was the maximum number of sentences that the subjects could read under the given time constraints.

The rating system in the present study might not have been satisfactory. The investigator conducted, evaluated, and scored the production test; hence, lack of objectivity in the ratings could be a possible drawback. The presence of at least three evaluators (preferably native-speakers with sufficient phonetics-phonology background) is desirable in future studies. Further, randomized data mixed with native speaker and near-native speaker data should make the evaluation process more accurate.

One might also question the validity of marking only the target structures, thereby

overlooking the overall comprehensibility of the subjects' production. As the investigator, I recognize the importance of this argument and therefore intend to measure the overall comprehensibility of subjects' production in future studies.

Furthermore, one may argue that the changes in behavior in the instructed groups may be short-term (see for example, Schwartz, 1993 and Schwartz & Gubala-Ryzak, 1992). For example, White (1990/1991, 1991) investigated the acquisition of verb-movement in English by French speaking children. One of her experimental groups, the *question group,* which received instruction on English question formation (including word order in questions, the need for do-support etc.) for two weeks exhibited changes in the scores of preference task. However, according to her follow-up study with the same subjects, the subjects had completely reverted to their pre-instructional behavior a year later (White, 1991). A similar follow-up study is required to examine whether the treated groups of this study can sustain their post-instructional behavior after a certain period.

Based on the foregoing discussion, the present study may be improved in the following ways. In fact, these measures are already being implemented, and the author is currently collecting data from new students in the same Japanese university. The study can be improved by including two data collection sessions. The first data collection session will be conducted and evaluated by the investigator, in a manner similar to the present study, in order to examine the aspects of phonology that improve on account of instruction. Further, the author plans to compare the results with those of the present study. The second session will involve native judges: (1) three NS raters with phonetics-phonology background will rate (2) randomized data (3) mixed with NS and near-native productions; they will rate (4) the subjects' overall comprehensibility of the production by (5) evaluating a dialogue read aloud, which will include as many target structures as possible. A posttest is scheduled to be conducted six months after the posttest.

4.3 Linguistic Input and Effect of Instruction

I now focus on the examination of the linguistic input that the subjects received and the effect of explicit instruction. As described earlier, during the four-month treatment, identical teaching material was used for all three experimental groups to standardize the input (i.e., *positive evidence*) received by the subjects. This teaching material provided subjects with ample exemplars of the target structures.

Along with the *positive evidence* from the teaching material, the *treated (instructed)* group received *direct negative evidence* in the form of *structure-focused* instruction and

corrective feedback. The instruction was composed of (1) an explanation of rules on the target structure and (2) explicit information regarding what is ungrammatical. The instruction also included oral exercises with a variety of classroom activities using the structures in question. On the other hand, the control group participated in similar comprehension and production exercises without receiving explicit instruction and corrective feedback regarding the target structures.

All three experimental groups had the potential chance to benefit from *indirect negative* evidence, which helps the learners determine that certain structure or cues are absent or non-occurring. This is considered to motivate learners to reset their L1 setting to the appropriate TL setting (White 2003, originally proposed by Chomsky (1981) for L1A; and Lightfoot (1999) for historical changes in English). Provided with ample exemplars of the target structures in the teaching material, our subjects may have had an opportunity to utilize the *indirect negative evidence* and realize the absence of certain structures (e.g., the use of full form in reductions). However, this did not seem to be the case for the control group since the subjects exhibited minimal improvement in the posttest phase of the production test. Given that the treated groups exhibited improvement, we can speculate that the two *negative evidences* (i.e., *direct* and *indirect*) may have a synergistic effect in changing the linguistic behavior of L2 learners. In other words, a single type of *negative evidence* is not sufficient to change the linguistic behavior of L2 learners (especially in the case of postpuberty learners). This was evidenced in Trahey & White's (1993) study on L2 syntax. They provided many exemplars of English adverb placement to French speakers without giving *direct negative evidence* and failed to change the learners' linguistic behavior; however, in White (1990, 1991), subjects who received both types of negative evidence exhibited improvement.

The role of classroom input (i.e., *direct negative evidence*, such as grammar teaching and error correction) in triggering behavior changes in L2 learners is not yet clear. Researchers such as White previously maintained that *direct negative evidence* is effective (White 1990, 1991). On the other hand, Schwartz and her colleagues (Schwartz, 1993; Schwartz & Gubala-Ryzak, 1992) argue that the behavior change in L2 learners was not based on restructuring of the interlanguage grammar. In fact, they suggest that the generalization was merely made on the basis of surface pattern and a separate system of learned linguistic knowledge (Schwartz, 1993). Acknowledging the possibility that parameter resetting does not occur on the basis of explicit classroom input, White argues that "this does not imply that explicit input is ineffective in L2 acquisition, only that whatever it affects is

not the system of UG-based principles and parameters" (White, 2003, p. 171).

Irrespective of whether the changes in linguistic behavior of L2 learners is the result of restructuring of the interlanguage system, I believe that the role of classroom input warrants further investigation, particularly the synergistic effect of *direct-* and *indirect negative evidence* in L2 classroom teaching.

5. Conclusion

The study investigated the changes in the perceptual and production abilities of Japanese English learners as a result of explicit instruction on segments or prosody. It also investigated the aspect of phonology that was affected by the explicit instruction given to the subjects. The results provide new pedagogical evidence that the ***prosody-oriented approach*** was effective in improving both learners' perception and production; furthermore, it was more effective than the ***segmental-oriented approach*** regarding production.

6. Acknowledgements

Firstly, I wish to express my sincere gratitude to M. Young-Scholten, my ex-supervisor, for her insightful comments and valuable advice during my stay in Durham, UK in the summer of 2004. I am greatly indebted to T. Fukami for the interesting discussions and the consistent encouragement and to K. Oga for the stimulating discussion and companionship. I wish to thank my research/teaching assistants, Y. Kondo, Y. Ezaki, and M. Mido, for their assistance in data collection and data entry. I am also very grateful to the students of the Waseda University for their contribution to this study. This work was supported by the Grants-in-Aid for Young Scientists (B-16720135) awarded from the Ministry of Education, Culture, Sports, Science and Technology, Japan. The support by Waseda University is also greatly appreciated.

7. References

Akita, M. (2001). *The Phonological Development of Adult Japanese Learners of English: a longitudinal study of perception and production.* Ph.D. thesis. University of Durham, U.K.

Bongaerts, T., Summeren, C., Planken, van B. & Schils, E. (1997). Age and ultimate

attainment in the production of a foreign language. *Studies in Second Language Acquisition* 19, 447-465.

Bot, de K. & Mailfert, K. (1982). The teaching of intonation: fundamental research and classroom applications. *TESOL Quarterly* 16, 71-77.

Bradlow, A., Pisoni, D., Yamada, R. & Tohkura, Y. (1997). Training Japanese listeners to identify English /r/ and /l/: some effects of perceptual learning on speech production. *Journal of the Acoustical Society of America* 101, 2299-2310.

Brown, A. (1992). "Twenty questions" In Brown, A. (Ed.) *Approaches to Pronunciation Teaching.* London: Macmillan, 1-17.

Celce-Murcia, M., Brinton, D. M., & Godwin, J. M. (1996). *Teaching Pronunciation: a reference for teachers of English to speakers of other languages.* Cambridge: Cambridge University Press.

Champagne-Muzar, C., Schneiderman, E. I. & Bourdages, J. S. (1988). Second language accent: the role of pedagogical environment. *International Review of Applied Linguistics in Language Teaching* 31(2), 143-160.

Chomsky, N. (1981). *Lectures on Government and Binding.* Dordrecht: Fortis.

Chun, D. (1988). The neglected role of intonation in communicative competence and proficiency. *Modern Language Journal* 72, 295-303.

Flege, J. E. (1987). A critical period for learning to produce foreign language? *Applied Linguistics* 8, 162-177.

Flege, J. E. (1995). Second-language speech learning: findings, and problems. In Strange, W. (Ed.) *Speech Perception and Linguistic Experience: theoretical and methodological issues.* Timonium, MD.: York Press, 233-273.

Gilbert, J. (1987). Pronunciation and listening comprehension. In Morley, J. (Ed.) *Current Perspective on Pronunciation.* Washington, D. C.: Teachers of English to Speakers of Other Languages.

Gilbert, J. (1993a). *Clear Speech Student's Book.* 2nd edition. New York: Cambridge University Press.

Gilbert, J. (1993b). *Clear Speech Teacher's Resource Book.* 2nd edition. New York: Cambridge University Press.

Gilbert, J. (1995). Pronunciation practice as an aid to listening comprehension. In Mendelsohn, J. & Rubin, J. (Eds.) *A Guide for the Teaching of Second Language Listening.* San Diego: Dominie Press.

Leather, J. (1983). Second-language pronunciation learning and teaching. *Language*

Teaching Abstracts 16, 198-219.

Lightfoot, D. (1999). *The Development of Language: acquisition, change and evolution.* Oxford: Blackwell.

Macdonald, D., Yule, G., & Powers, M. (1994). Attempts to improve English L2 pronunciation: the variable effects of different types of instruction. *Language Learning* 44, 75-100.

Morley, J. (1991). The pronunciation component in teaching English to speakers of other languages. *TESOL Quarterly* 25, 481-520.

Morley, J. (1994). A multidimentional Curriculum design for speech-pronunciation instruction. In Morley, J. (Ed.) *Pronunciation Pedagogy and Theory: new views, new directions.* Alexandria, VA, USA: Teachers of English to Speakers of Other Languages.

Moyer, A. (1999). Ultimate attainment in L2 phonology: the critical factors of age, motivation and instruction. *Studies in Second Language Acquisition* 21, 81-108.

Murakawa, H. (1981). *Teaching English Pronunciation to Japanese Adults.* Unpublished doctoral dissertation, University of Texas, Austin.

Pennington, M. (1989). Teaching pronunciation from the top down. *RELC Journal* 20, 207-225.

Pennington, M. C. (1998). The teachability of phonology in adulthood: a re-examination. *International Review of Applied Linguistics* 36, 323-341.

Pennington, M. C. & Ellis, N. C. (2000). Cantonese speakers' memory for English sentences with prosodic cues. *Modern Language Journal* 84 (3), 372-389.

Schwartz, B. D. (1993). On explicit and negative data effecting and affecting competence and 'linguistic behavior'. *Studies in Second Language Acquisition* 13, 386-402.

Schwartz, B. D. & Gubala-Ryzak, M. (1992). Learnability and grammar reorganization in L2A: against negative evidence causing unlearning of verb movement. *Second Language Research* 8, 1-38.

Suter, R. W. (1976). Predictors of pronunciation accuracy in second language learning. *Language Learning* 26 (2), 233-253.

Trahey, M. & White, L. (1993). Positive evidence and preemption in the second language classroom. *Studies in Second Language Acquisition* 15, 181-204.

Ueno, N. (1998). *Teaching English Pronunciation to Japanese English Majors: a comparison of a suprasegmental-oriented and a segmental-oriented teaching approach.* Tokyo: Liber Press.

White, L. (1990/1991). The verb-movement parameter in second language acquisition. *Language Acquisition* 1, 337-360.

White, L. (1991). Adverb placement in second language acquisition: some effects of positive and negative evidence in the classroom. *Second Language Research* 7, 133-161.

White, L. (2003). *Second Language Acquisition and Universal Grammar.* Cambridge: Cambridge University Press.

Yule, G. & Macdonald, D. (1994). The effects of pronunciation teaching. In Morley, J. (Ed.) *Pronunciation Pedagogy and Theory: new views, new directions.* Alexandria, VA, USA: Teachers of English to Speakers of Other Languages.