EFFECTS OF TWO TEACHING METHODS OF CONNECTED SPEECH IN A POLISH EFL CLASSROOM*

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Abstract
Abe (2010) argues that the Negotiation of Form (NF) instruction exerts positive effects on learning of connected speech by Japanese learners of English, finding that the progress achieved with NF was more significant than for the traditional treatment. The study reported here seeks to uncover the acquisitional value of NF in a Polish classroom.

The study hypothesizes that NF, in comparison with the deductive teaching method, effectively promotes learning of assimilation, elision and weak forms. The hypothesis was tested by investigating production and perception of 50 Polish students of English. As for evaluating the effects of the two types of instructions, a classic pretest-posttest design was used. With regard to methodology, acoustic analysis was performed.

The results demonstrate that in general, NF proved more effective than NNF. With regard to individual processes of connected speech, NF was more effective in production, whereas no such effect was found for perception.

Keywords: connected speech, Negotiation of Form instruction, non-native speakers, pronunciation pedagogy, EFL

1. Introduction

The aim of this study is to provide an answer to the question how learners of a second language produce and perceive reduced forms by comparing two teaching methods, deductive and inductive. According to Johnson (2004), the use of reduced forms in speech is massive as approximately every fifth function word contains a reduced segments as does every tenth content word. The way native speakers of English deal with reduced forms has been already investigated

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and accounted for by means of usage-based and exemplar theories (e.g. Bybee, 2013). Still, the challenge that connected speech poses to non-native speakers of English has been long noted in perception and production alike. Cruttenden (2008) observes that the second language is often learnt on the basis of words in isolation and encourages EFL learners to familiarize themselves with assimilatory tendencies and weak forms. In a similar vein, Ernestus and Warner (2011) quote the form *yeshey* as a heavily reduced version of *yesterday,* stressing that reduced forms cannot be looked up in a dictionary by learners of English nor can they be explained by native speakers who are not usually aware of reduction mechanisms. Shockey (2003) points to lack of significant contact with reduced forms if learners of a second language are taught by non-native speakers. In light of these statements, it can be concluded that there is a need for testing and implementing more effective methods of teaching processes of connected speech to ESL learners.

Thomson and Derwing (2014) provide an overview of previous scholarship, revealing the past and current trends in pronunciation pedagogy: "When we examined researchers' choices of focus of instruction, we found segmentals were investigated in 53 per cent of the studies (e.g. Elliot, 1995; Warsi, 2002; Garcia, 2005; Huthaily, 2008; Gonzales-Bueno and Quintana-Lara, 2011; Liu and Fu, 2011), while 23 per cent focused on suprasegmentals (Harris, 2002; Yanli, 2008; Gomez Lacabex and Garcia Lecumberri, 2010; Muller Levis and Levis, 2012) and 24 per cent dealt with both, usually in combined lessons but occasionally as separate comparison groups" (Thomson and Derwing, 2014: 4). The studies in suprasegmentals mentioned above were devoted to rate, intonation, loudness, pitch and duration. Only three studies, by Gonet and Stadnicka (2006), Gomez Lacabex et al. (2009) and Gonet et al. (2010), directly address the topic of weak forms. Processes of connected speech, manifested as reduced forms, affect both vowels (weak forms) and consonants (elision and assimilation). The only study, considering elision and assimilation apart from weak forms was conducted by Abe (2010) on Japanese learners of English.

The present study aims to contribute to understanding how non-native speakers of English acquire selected processes of connected speech. In particular, it addresses the issue of pronunciation pedagogy in acquisition of connected speech in a Polish classroom. In the growing body of work on Second Language Acquisition by Polish learners of English, segments hold a position of particular prominence. Production and acquisition of English segments by Polish subjects has been widely studied and extensively documented; in comparison, connected speech receives little scholarly attention. There is a number of studies on vowels and consonants: e.g. Schwartz (2011) examines the acquisition of /ŋ/ by Polish learners of English, Rojczyk (2011) investigates learning of /Θ/ whereas Waniek-Klimczak (2011) seeks to explore the relationship between style and aspiration, a segmental phenomenon. No single study on connected speech in Polish learners of English has been endeavored so far; the studies of Gonet and Stadnicka 2006, Gonet et al. 2010, being rare exceptions, focus on

vowel clipping and vowel reduction in connected speech but not on elision or assimilation. Thus, the study aims to address this neglect by investigating production and perception of weak forms, elision of /t/ and assimilation of place in the guise of Yod coalescence which surface as phonetically reduced forms. This selection of processes of connected speech was motivated by relatively high frequency of use as well as their perceptual salience.

More specifically, the aim of the study is to compare the effects of two teaching methods: deductive and inductive. The former denotes the order in which students acquire a rule and then, proceed to apply the rule in a variety of contexts (e.g. by drills). In the latter, the direction is opposite, from the particular to the general: for instance, students work collaboratively to discover the rules by working with authentic language samples and progressively modify and complete the rules with new input and teacher's feedback. The deductive method derives from the Form Focused approach which, in turn, was adapted from L2 grammar studies (Spada and Tomita, 2010), revealing benefits such as integration of form and meaning or developing metalinguistic knowledge as opposed to decontextualized drills and repetitive tasks (for a more extensive discussion, cf. Saito and Lyster, 2012). It seems that the use of Form Focused approach in pronunciation teaching is recently gaining momentum, e.g. the study by Saito and Lyster (2012) reveals the benefits of FF in acquisition of /r/ by Japanese learners of English and factors Corrective Feedback into FF. Following Abe (2010), the present study selects Negotiation of Form as the inductive instructional technique. As far as teaching methods are concerned, the deductive one prevails in the Polish classroom. Typically, learners are presented with a theoretical explanation of a selected linguistic phenomenon, illustrated with few examples and, having received a deductive instruction, they then proceed to practice the feature of English phonology in question. The other, inductive type of instruction, in which the learners themselves discover a linguistic phenomenon via negotiation of form, appears to be much less commonly used. Negotiation of Form (NoF) represents an approach in SLA which focuses on form and deliberately employs the concept of linguistic error so that the learners are encouraged to identify the error and negotiate a correct form that they incorporate into their own grammar or phonology (Pica, 1994; Lyster, 2001; Ellis, 2006). As Abe (2010) notes, "a linguistic error is made explicit to activate learners' cognition" (Abe 2010: 1). Negotiation of Form in pronunciation pedagogy consists in identifying the phonetic differences between two phonetic forms by learners themselves. One phonetic form contains a particular phonetic feature; by contrast, the other one is either missing the feature or uses it in the wrong context. Abe's (2010) results indicate that the NoF group surpassed the inductively-taught group in production and perception. Not only did NoF boost general production and perception of connected speech, but also demonstrated significant benefits across selected processes of connected speech (linking, rhythm, assimilation and elision). In addition, its instructional effect was lasting.

In connection with the above observations, the study's research question is whether the inductive method (IM) is superior for the production and perception of connected speech in a Polish ESL classroom. Building on Abe's study who found that NoF is more effective in teaching connected speech, it is hypothesized that NoF, the Inductive Method, in comparison with the deductive method (DM), is more effective in teaching weak forms, assimilation and elision in a Polish classroom. In particular, the study addresses the following research questions:

i. Does phonetic background help students of English to produce and recognize processes of connected speech (pretest)?
ii. Is the Inductive Method a superior method of instruction for the perception and production of connected speech than the Deductive one (comparison of pretest with posttests)?
iii. Does any of the methods improve the processes of connected speech considered to an equal degree?

A straightforward comparison of inductive and deductive teaching methods is perhaps not novel in the context of SLA. The present study, however, seeks to advance our understanding of the ways in which non-native speakers produce and perceive processes of connected speech and to fill the gap in the literature. Additionally, the study aims to examine the attitudes to connected speech among the Polish subjects.

2. Method

2.1. The subjects

The participants

50 Polish undergraduate students of English of a state university, aged between 21 and 23 years old, were the subjects of the study. The participants were randomized into two groups: the experimental group, consisting of 29 subjects who received the inductive method via the Negotiation of Form instruction (Inductive Method group, IMG) and the control group with 21 participants that received the deductive instruction (Deductive Method Group, DMG). Due to the fact that stress, weak forms, intonation as well as other processes of spoken English are a part of the curriculum of the course during which the study was conducted, none of the subjects were familiar with the specific aims of the study. The level of participants might have been described as advanced as they had passed their first year exams where the advanced level is a prerequisite.

All participants attended a two-year course in pronunciation. The design of the course is as follows: in the first year, the students are familiarized with vowels, diphthongs and consonants of English whereas suprasegmentals are covered in the second year of studies. In addition to the course, the students attended a course in phonetics and phonology, including elements of connected speech. Their presentation, however, assumed the form of a brief, theoretical introduction, leaving no time for practice. Consequently, the participants of the

present study have already drilled the segments of English and had previous, although relatively limited and passive, knowledge of weak forms, assimilation and elision from the course in phonetics and phonology. It must be stressed that the course in phonetics and phonology was just a lecture (which means it was not obligatory) and contained no exercises.

The instructor
The EFL teacher was female and had 12 years of experience in teaching as well as a strong background in English phonetics (her PhD thesis addressed the issue of processes of connected speech).

2.2. Procedure

Both groups (IMG and DMG) covered the same processes of connected speech, i.e. weak forms, elision of /t/ and assimilation of place, i.e. Yod coalescence. The instruction periods involved two classes per each process, totaling six classes. The instruction part of the first classes lasted around 45 minutes, followed by 45 minutes of practice of the presented material (in one 90 minutes class), whereas the second classes was entirely devoted to exercising weak forms, assimilation and elision respectively. All participants, regardless of teaching method, performed the same set of exercises, compiled by the author from various sources such as (Roach, 1998), Cook (1991) and Lujan (2006). All of the classes took place in a classroom of a state university.

The inductive instruction allowed the participants to identify a correct phonetic form via identification of a deliberate, linguistic error and to negotiate of the correct form. It involved the following stages: firstly, the subjects familiarized themselves with the orthographic transcripts of a recording. Next, they listened to the recording in two versions: e.g. with and without elision. Then, the instructor asked the participants to compare the two versions in pairs. Afterwards, the subjects performed pair work by comparing phonetic differences between the two versions of the recording, negotiating the form and sharing their observations with the rest of the group. Finally, the instructor elicited the differences between the two versions identified by the participants and, using their remarks, summed up a process of connected speech, using the subjects' generalizations as to the phonetic context (/t/ elision, assimilation) or the grammatical category (weak forms).

With regard to the deductive instruction, a PowerPoint presentation clearly announced the process of connected speech and included a number of relevant definitions, adapted from Trask (1996), Bussmann (1996), Shockey (2003) and Carr (2008). Next, the instructor outlined the rules governing weak forms, assimilation and elision. Then, the selected feature was illustrated with examples from Shockey's (2003) book website[1]. The listen-and-repeat procedure followed

[1] http://www.blackwellpublishing.com/shockey/downloads.htm

the presentation of the audio material. The design of the two groups reflects the differences between IM and the deductive instruction: the participants from the IMG group discovered the properties of weak forms, assimilation and elision by means of identifying the phonetic differences in the recordings with very insignificant assistance on the part of the instructor, whereas in the DMG group, the instructor presented some theoretical knowledge of connected speech processes that the students were supposed to apply in their speech. The other difference between the two types of instruction comes down to interactive (IMG) vs. passive learning (DMG). Table 1 summarizes the difference between the two teaching methods:

Table 1. A summary of the procedure

The Inductive Method Group		**the Deductive Method Group**
Pretest		Pretest
negotiation of form (assimilation, 45 minutes), exercises	Class/week 1 (90 minutes)	owerpoint slides (assimilation, 45 minutes) listen-and-repeat, exercises
Exercises in assimilation	Class/week 2 (90 minutes)	Exercises in assimilation
Negotiation of form (elision, 45 minutes), exercises	Class/week 3 (90 minutes)	Powerpoint slides (elision, 45 minutes) listen-and-repeat, exercises
Exercises in elision	Class/week 4 (90 minutes)	Exercises in elision
Negotiation of form (weak forms, 45 minutes), exercises	Class/week 5 (90 minutes)	Powerpoint slides (weak forms, 45 minutes) listen-and-repeat, exercises
Exercises in weak forms	Class/week 6 (90 minutes)	Exercises in weak forms
Posttest 1	Week 7	Posttest 1
Posttest 2	Week 13	Posttest 2

As a matter of course, in the case of native speakers of English, the status of assimilation and elision is not obligatory, largely depending on audience design (Bell, 1985, 2001), attention (Labov 1994) and/or individual choice on the level of phonostylistics. The instructor strongly encouraged Polish learners of English to use the reduction processes at all times on the grounds that their pronunciation should resemble that of the native speakers when they speak in a natural, fast way. The other reason for executing the processes of connected speech, should the context arise, was to develop the students' awareness of processes of connected speech by analogy to hyperarticulation (Lindblom, 1990) in teaching segments. In the non-experimental part of the course, the instructor explained that speech style governs the use of weak forms, assimilation and elision and exposed the subjects to different speech styles.

2.3. The tests

The aim of the study was to compare the effects of two types of instruction. A classic pretest-posttest design served the objective of the study in which the test was conducted three times: pretest prior to treatment, posttest 1 immediately following the treatment and posttest 2, performed six weeks after posttest 1 to verify the effects over time. The test comprised two parts, examining production and perception respectively. In the course of the production part, the subjects were recorded reading a list of 15 sentences, exemplified as follows: *I **can** see it*, *That play wasn'**t** particularly good, Where'**s** **y**our book?* (for a full list, see Appendix 1). Although Thomson and Derwing (2014) do not advocate the use of read speech in pronunciation pedagogy, the study implements read sentences for the following reasons: the occurrence of phonetic context for /t/ elision, assimilation of /s, z t, d/ to /j/ and weak forms, to a smaller extent, could be easily controlled in carefully constructed sentences whereas in fully spontaneous speech, the learners might well not have produced enough material to test and assess the progress with the two teaching methods. More specifically, Read speech rather than fully spontaneous speech was elicited from the subjects for the following reason: in fully spontaneous speech, the occurrence of a process is not obligatory and may be highly speaker-dependent. Huber (2010) demonstrates in a corpus-based study that assimilation of place has low frequency of occurrence, i.e. 5 per cent of all processes from the corpus. Consequently, SL learners may not consistently use phrases or words which would have a context triggering assimilation. Predesigned sentences were a way to ensure that every process (deletion, assimilation and weak form) was represented in the same neighborhood of sounds for all speakers.

Perception was investigated by means of a listening task in which the participants had to identify in writing the missing words from a list of 20 sentences they heard. Usually, the number of missing words did not exceed four short ones at a time, e.g. *Of cour**se** **y**ou know Geoff*, *He had **h**is turn* or *You **and** I need **to** talk* (for a full list, cf. Appendix 2). In addition, the instructor asked the subjects to supply the name of the process they heard in the line below the sentence. Each sentence was played only once. Bold font captures the processes of connected speech, as heard by the participants. Note that the five last sentences contained no weak forms, assimilation and elision on purpose to verify whether the subjects perceive the processes which did not, in fact, occur in the recording. The sentences from the production part were not used in the training.

All recordings took place in a classroom at the Faculty of English and were collected by means of the Praat software (Boersma and Weenink 2012) in the WAV format.

2.4. The speech material

The study replicates Abe's (2010) which considered acquisition of connected speech in Japanese learners of English; therefore, its scope is limited to his selection of connected speech processes such as weak forms, assimilation and elision. Linking, Abe's fourth process, was excluded from the present study since its subjects followed American English model of pronunciation and linking of /r/ appears in the British variety, or any non-rhotic variety of English. The study treats weak forms as the alternation between strong and weak forms, governed by grammatical categories rather than individual or text-induced emphasis. It also considers the most salient instance of assimilation, i.e. Yod coalescence. The study investigated elision in a similar vein, with respect to consonants rather than vowels.

In designing the tests, the study followed Abe's (2010). With regard to the perception part, a Pole whose upbringing in the US resulted in a native-like pronunciation, performed all the recordings in order to abstract away from the issue of familiarity with the instructor's voice (Newman and Evers, 2007).

2.5. The analysis

Abe (2010) judged the subjects' performance on a scale from 1 (poor pronunciation) to 5 (near-native pronunciation) which reflects the overall impression and rates the goodness. Researcher's expectancy might have biased the assigned marks; instead, the present study used a more objective way to analyze the subjects' performance. The application of weak forms, assimilation and elision was thus captured in binary terms, 1 denoting a correct use of the processes, 0 standing for failure to do so. Spectrographic analysis helped to determine the presence/absence of vowel reduction in weak forms, assimilation and, in particular, elision (Boersma and Weenink 2012):

As can be seen from Figure 1, the bar denoting burst of the stop is not visible, neither is the closure stage manifested as a longer period of silence, indicating /t/ elision. Likewise, in analyzing perception of connected speech, the participants scored 1 point for correct recognition of an feature (or for its lack in the last five sentences); otherwise, 0 was assigned. It must be stressed, however, that the analysis resorted to acoustic measurement only for the production part, not for perception.

For evaluating the differences between the two groups, the experimental and control ones, one- and two-way Anova was used with Tukey (Honest Significant Difference) corrections.

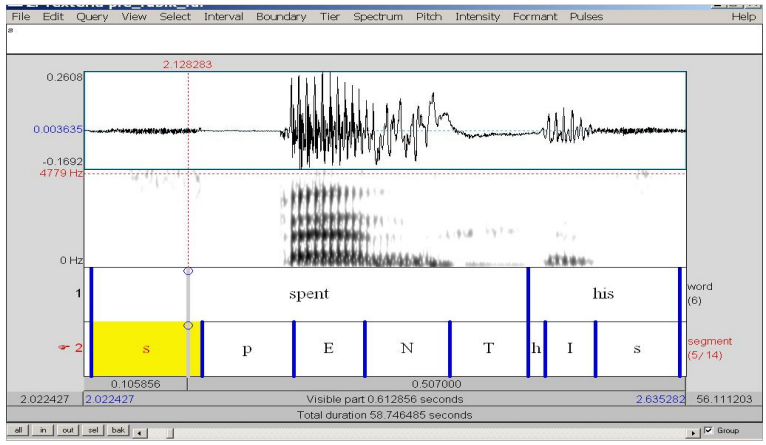

Figure 1. An illustration of acoustic analysis in problematic cases

2.6. The questionnaire

The study aims, apart from evaluating the effectiveness of the two methods, to provide insight into subjects attitudes towards casual speech in general. To this end, the subjects filled in a short questionnaire in the beginning of the course which included questions about what they remember from their previous courses with regard to connected speech and what they considered to be the real difficulty in pronunciation of English by native speakers.

3. The results

3.1. General results

The section begins with general results denoting that the results for the individual processes of connected speech (assimilation, elision and weak forms) have been collapsed into a single score in order to compare the pre-test and post-tests production and perception performance of the subjects in the control and the experimental group.

Figure 2 demonstrates the correct use and identification of the selected processes of connected speech, considered in this study. The effect size between production and perception failed to reach significance: r=-0.22, Cohen's d =-0.46, (production: M=6.87, SD=2.62, perception M=8.64, SD=4.67). A p level of 0.05 applies in all analyses reported below.

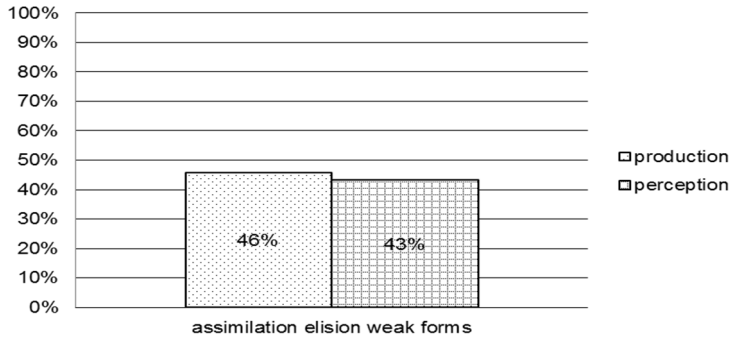

Figure 2. Perception vs. production (pretest)

Turning to individual processes of connected speech, a hierarchy of difficulty in production and perception emerges:

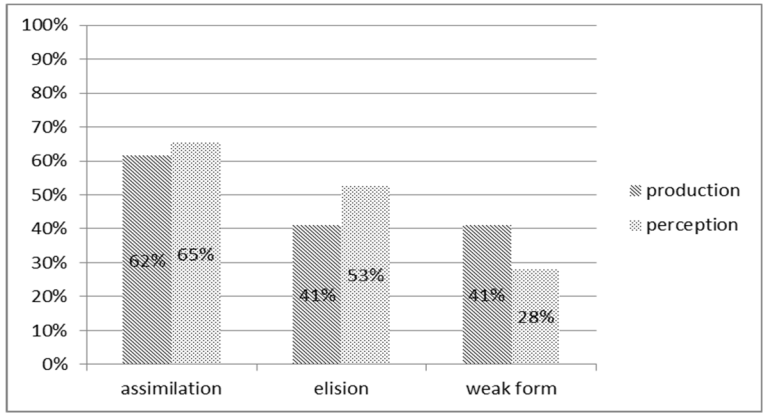

Figure 3. Perception vs. production across processes of connected speech (pretest)

Effect size for assimilation is not significant reaching the level of r=-0.17, Cohen's *d* =-0.08, (production: M=3.07, SD=1.01, perception M=3.27, SD=1.3). For elision, it is not significant reaching the level of r=-0.49, Cohen's *d* =-0.24, (production: M=2.01, SD=1.16, perception M=2.63, SD=1.18). Only for weak forms, effect size was medium: r=0.58, Cohen's *d* =0.27, (production: M=2.05, SD=1.32, perception M=1.41, SD=0.82). Regardless of differences between production and perception, a tentative hierarchy of difficulty for Polish learners appears: one may conclude from the pretest, prior to treatment by either method, that assimilation was the easiest to use and identify by Polish learners of English, followed by elision whereas weak forms presented the greatest difficulty.

3.2. Results for effectiveness of the two methods

Turning to testing the hypotheses that the Inductive Method is more effective than the Deductive one, the results are presented below, for production and perception separately:

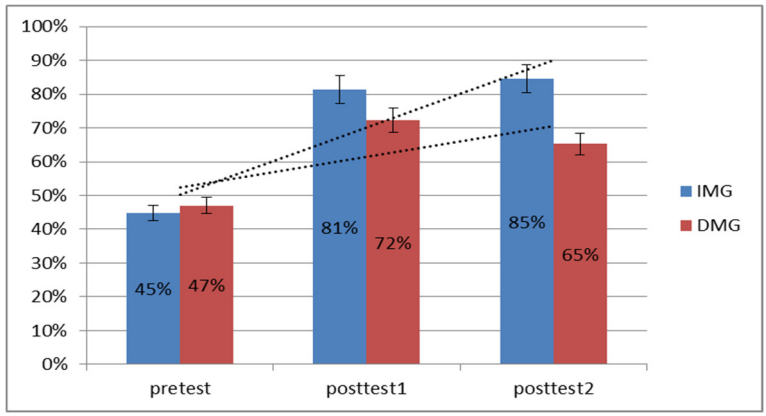

Figure 4. Production across groups

The trends depicted in Figure 4 point to higher effectiveness of the inductive method relative to the deductive one. The real effectiveness of these two types of instruction, however, is evidenced in the progress (or lack thereof): the IMG group made a very significant improvement which remained at a stable level in two posttests, displaying an increasing tendency for correct production of assimilation, elision and weak forms. The DMG group, on the other hand, exhibited a decline in production when comparing posttest 1 with posttest 2. Therefore, it appears that in the long run, the inductive instruction proved more efficient in teaching connected speech. The IMG group seemed to have gained a considerable edge over the DMG group, given the six weeks long interval between the two posttests.

Figure 5 reveals a similar trend for perception. These trends merit further analysis which report differences between the two methods. To this end, a two-way Anova was run with Group as a between-subjects factor, teasing apart the actual effectiveness of the two teaching methods. Next, a parallel two-way Anova with Time as a within-subjects factor was performed. The Tukey's Honest Significant Difference test served as a post-hoc test. Regarding production, the effects of Group for posttest 1, $F(1, 50)=11.531$ and posttest 2, $F(1, 50)=59.257$ were significant, as were the effects of Time. Thus, the IM group showed the greatest overall improvement in production not only with respect to reduced forms but also experienced lasting effects in comparison with the Deductive Method. In perception, the tests of group indicated a difference in favor of the Inductive Method ($F(1,50)=5.889$ for posttest 1 and $F(1,50)=19.794$

for posttest 2). The effects of Time, however, were not evidenced in posttest 2 (F(1,50)-0.91). Tukey (HSD) tests indicated that there was a difference in favor of DM in the posttest 2 in perception.

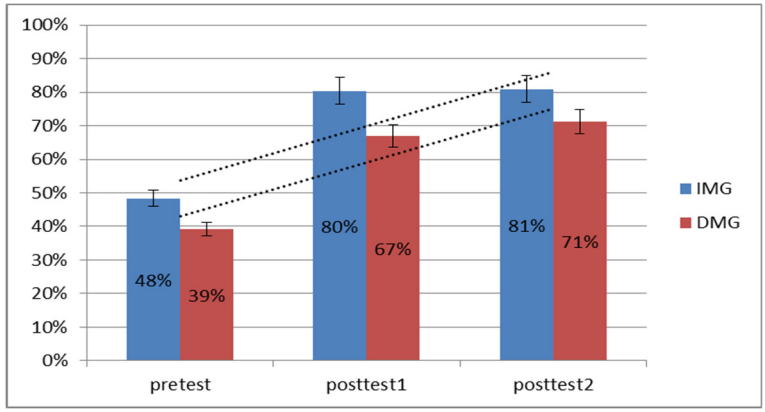

Figure 5. Perception across groups

Thus, the IMG exhibited significant improvement in acquiring elision, assimilation and weak forms and a partial improvement over time in perception, given that the tests are applied to a total of reduced forms, summing up elision, assimilation and weak forms.

3.3. Results for processes of connected speech

Another question which might be addressed within the hypothesis is whether all processes of connected speech improved to an equal degree. Figures 6 and 7 present the differences using a cumulative graph for the sake of clarity of presentation (hence the *y* axis adds percentage values):

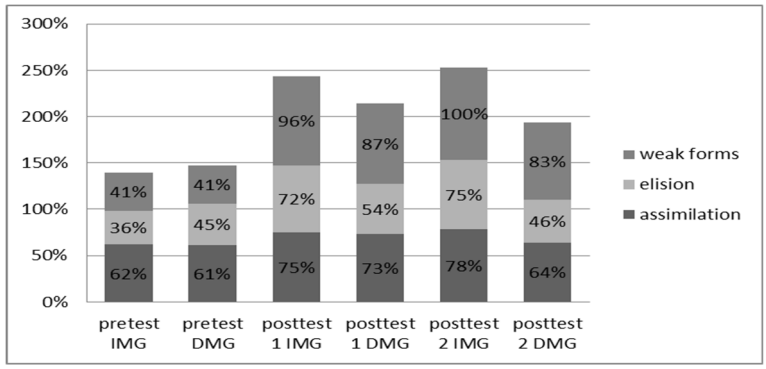

Figure 6. Production of connected speech processes across groups

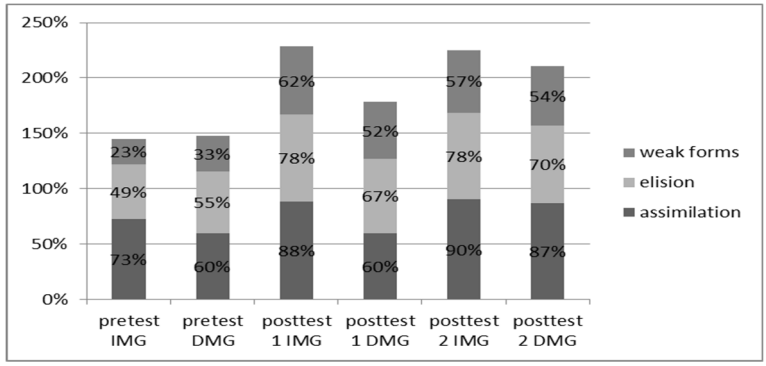

Figure 7. Perception of connected speech processes across groups

The data for production and perception of individual processes of connected speech were submitted to two-way Anova mixed design with teaching method (between groups) and Time (within subjects) as factors. As for Group, effects for assimilation, elision and weak forms were significant in posttests 1 (assimilation: F (2, 50)= 7.79, elision: F (2, 50)=5.64, weak forms: F (2, 50)= 5.96) whereas in posttest 2 for assimilation and weak forms, failed to reach statistical significance, F (2, 50)=0.

Since the study, apart from comparing two teaching methods, focuses on gains over time, a two-way mixed Anova was used to evaluate temporal effects within subjects. In production, the effects of time reached significance for the phase pretest-posttest 1 (F(2,50)=29.82 as well as the pretest-posttest 2 phase (F(2,50)=9.69) but not for the posttest 1 – posttest 2 phase (F(2,50)=2.45). To sum up, within-subject differences are evident for the two groups as far as the test phase pretest-posttests 1 and 2 are concerned. It appears that the gains over time were not achieved by the inductive method in production, as opposed to the deductive method. For perception, none of the methods proved extremely efficient within the course of six weeks from the posttest 1 (F(2,50)=1.40).

4. Discussion

4.1. Discussion of posttests

In answering the research question of IM's advantages over DM, the IM instruction proved more effective than the deductive one in both production and perception. The effectiveness of the former was more visible in posttest 2 than posttest 1, thus its effects were holding over time. In explaining the lasting effects of IM, one may evoke the 70/20/10 principle (a model in learning and development, Lombardo and Eichinger 1996) where success involves experience, involvement and exercise, regulated by the 70, 20 and 10 per cent distribution respectively. Both IMG and DMG groups had the same percentage

of experience (a lecture in phonetics and phonology) and exercises (the same exercises). It must have been the involvement that is attributable to the difference in results: the IMG group was actively participating in formulating observations, the DMG group's role was limited to performing the function of passive recipients of a presentation, delivered by the instructor.

With regard to individual processes of connected speech, it appears that IM tends to promote learning of weak forms to the highest degree in comparison with assimilation and elision. Interestingly, the IM instruction was more effective than the deductive one in production; in the case of perception, there were no statistical differences between the two types of instruction (Table 4). A possibility arises that the subjects might have become familiar with the sentences from the perception part and relied on their memory rather than knowledge, being able to guess the missing words. This possibility that the participants might have remembered the sentences which aided in perception cannot be entirely excluded; the instructor, however, repeated the tests at the interval of six weeks in which the subjects may have as well not recalled the sentences.

The study's results are consistent with Abe's (2010) who found that the Japanese learners of English, taught by means of IM instruction, performed significantly better than those who received deductive instruction. The results for Polish and Japanese learners, however, cannot be compared directly due to methodological differences. Abe rates the goodness of the performance, following an EFL/ESL intelligibility index consisting of five levels (Morley, 1998) which he uses in collaboration with a native speaker of English. Instead, the present study attempts to quantify the presence/absence of a feature of connected speech, established via acoustic analysis. Only general tendencies and progress can be compared for Polish and Japanese learners.

No significant differences between production and perception of weak forms, assimilation and elision were reported by Abe (2010) in pretest, which is consistent with the findings of the present study. The overall progress of acquisition reveals similar trends for Polish and Japanese learners of English: he also notes that the IM instruction group achieved better results than the deductive one in the longer run, corroborating the present study's outcomes. Polish learners, on the other hand, exhibited a greater variation than the Japanese ones with regard to the differences between weak forms, assimilation and elision. Abe finds the effects of the IM instruction type to be consistent across all tested processes of connected speech, whereas IM positively influenced only production of Polish subjects. It must be stressed that the Polish control group did not perform poorly at all in comparison with the experimental group (which is not reported for the Japanese learners). A possible explanation is that in Polish classroom, the deductive instruction has a long tradition and is widely used. In this connection, the learners might have well been used to the deductive form of presentation and had learned in their schooling to make a good use of it.

As for the comparison between the two post-tests, it was hypothesized that the inductive method, due to the Negotiation of Form instruction, and its

cognitive potential, will exert lasting influence on subjects' acquisition of connected speech (within-subjects comparison). Table 5 does not support this as the IMG's result was not significant in the course of six weeks from posttest 1 in production. In perception, in line with between-group comparison, neither inductive nor deductive method improved the subjects' performance in a significant way. A way of interpreting the poor result of the two methods in the temporal aspect of perception may be found in the relatively limited exposure to audio materials and listening activities in the course of the treatment.

4.2. Discussion of pretest

The aim of the pretest was to establish the subjects' baseline with a view of comparing it to their performance after the treatment. Performance of connected speech by non-native speakers of English is poor as the achieved results were below 50 per cent. This finding is especially disappointing given the subjects' linguistic background and extensive phonetic training. The design of the practical phonetics course at the Faculty of English necessitates certain modifications to allow more time for exercising weak forms, assimilation and elision.

Figure 2 demonstrates the correct use and identification of the selected processes of connected speech, considered in this study. The difference between production and perception of connected speech is significant only for weak forms, although there was a systematic misunderstanding of one third of the sentences used in the perception part. On hearing the sentences numbered 1, 4, 7, 11, 12, 13, and 14, almost every single student failed to fill the gaps (Figure 3) and requested to repeat the recordings once or more. Indeed, these problematic sentences displayed high degree of assimilation and elision, resulting in wrong identification of words affected by the processes. For instance, the heavily assimilated phrase *as you say,* was rendered by the subject as *as they say, as I say, they just say, I've just said*, evidencing that the participants actually captured the phonetic effect of assimilation. The question number 12, *what did you mean,* was misunderstood as for the tense, resulting in *what do you mean* and *what you mean* versions (regardless of ungrammaticality). The greatest challenge, however, was posed by sentence number 14: *wouldn't it matter?* due to strong nasal component in the first word. The subjects heard *when it matter, when that matter, whether it matter* and so on instead. The above observation about the high error rate among the subject dovetails with what Shockey (2003) and others noted: "In general, non-native speakers take longer than natives to interpret relaxed conversational input. They depend heavily on syntactic-semantic information to arrive at an understanding rather than using phonological context to disambiguate reductions" (Shockey, 2003: 122-123). Thus, one third of sentences from the perception part, misunderstood by nearly all subjects points to a serious problem with perception.

Three factors might contribute to poor understanding of connected speech: very few subjects could profit from a longer stay in an English-speaking country (naturally, they have classes with native speakers but might end up receiving foreigner talk instead). There is also lack of good teaching materials, using corpora examples of reduced speech is a rare practice. Finally, the subjects are encouraged to drill vowels and consonants at the expense of listening activities.

It follows from Figure 3 that certain processes of connected speech, resulting in reduced forms, presented greater difficulties than others: assimilation was the easiest to use and identify by Polish learners of English, followed by elision whereas weak forms presented the greatest difficulty. The following two factors account for good perception and production of assimilation: perceptual salience and orthography. Only Yod coalescence was used as an example of assimilation in the present study, thus, its by-product i.e. affricate was easy for the subjects to hear and imitate due to the strong hissing component of the fricative (spirants reach up to 8000 Hz, Cruttenden, 2008). In addition, the subjects might have well been familiar with the unconventional orthographic rendering of e.g. *don't you* as "dontcha" which is relatively common in pop songs and internet chats.

As for poor results for weak forms, the transfer hypothesis might be proposed as Polish has no weak forms or schwa, whereas it does have elision (Sawicka, 1985) and assimilation (Wierzchowska, 1980). The differences between production and perception, however, cast serious doubts on the transfer hypothesis due to two observations: firstly, elision was less frequently used than assimilation, reaching the level of weak forms; secondly, assimilation was identified more frequently than elision. If the transfer from mother tongue took place, there would be no or very insignificant difference between elision and assimilation (present in both Polish and English), the difference in fact was 20 per cent in the case of production and 12 in perception. Under the transfer theory there would be a considerable difference between elision (present in both languages) and weak forms (present in English, absent in Polish), whilst in production, they both were used to the same degree. It seems that a more fine-grained account than transfer is worth pursuing.

Two alternative accounts might be put forward in light of the pretest's results, instead of the transfer hypothesis: (i) similarity of phonetic context: mere presence or absence of a feature of connected speech overlooks the correspondence (or lack thereof) of phonetic context in two languages. English Yod coalescence is severely restricted to the context of alveolar stop and a palatal. So is Polish assimilation in having very few contexts, connected either with place of articulation or voicing (Jaworski, 2007). Bearing strong phonetic resemblance, English assimilation was successfully identified and used by the Polish subjects. On the other hand, elision in Polish affects a different set of sounds: /g, k, p, t, w, f, v, b, x, l, n, m, r/ (Sawicka, 1995; Jaworski, 2007) than English: /p, t, d, k, h/ (Wells, 1990). Not only does the class of sound differ but also phonetic distribution: for instance, Polish /w/ elision operates intervocalically whereas elision of /t/ or /d/ in English almost invariably occurs

word or syllable-finally in a consonant cluster. In this connection, it is argued here that Polish students noted what is very much alike (place of articulation for assimilation) rather than what is drastically different (context and distribution of elision) (ii) the nature of the change affecting sound, proposed in terms of gradualness/radicality of a change: the change of a stop into an affricate (i.e. the byproduct of Yod coalescence) is quite radical and thus, salient for perception (though for a discussion on the gradual vs. categorical nature of the change in the case of assimilation, see Ellis and Hardcastle, 1992). So is the result of elision, deleting a segment completely. The difference between strong and weak from is rather gradual by contrast in that is uses a combination of three phonetic parameters: stress, duration and pitch. This also leads to the conclusion that IM, unlike the deductive type of instruction, is sensitive to gradual changes such as reduction of vowel to schwa. In phonetic terms, IM seems to be a promising instruction to guide learners to bridge the gap between full and reduced form as the subjects from the IM group had to compare a more natural (reduced) version of the recording with the one where vowels were not reduced. Notably, IM was less effective for those processes of connected speech which affected consonants (elision and assimilation). The above suggestions are speculative and should not be construed as full-fledged explanations since they would require strong empirical evidence, beyond the scope of this study.

4.3. The questionnaire

Prior to conducting the study, a short questionnaire was administered to establish the students' familiarity with connected speech and what they consider to be the most difficult in pronunciation of native speakers of English. As for familiarity with connected speech, 50 per cent of the subjects could not name a single feature, either leaving a blank (sometimes even a question mark) or furnishing a comment along the "I cannot remember after my holidays" line. 4 per cent enumerated intonation as a feature of connected speech, 10 per cent managed to recall the notion of phonostylistics. The remaining 36 per cent listed assimilation, elision and coalescence among the processes of connected speech. One person added "reduction", whereas only one subject mentioned h-dropping. The level of knowledge of connected speech, as displayed by the students of English, is rather alarming, given that the course in phonetics and phonology ended in a written exam in June (the questionnaire was conducted in the very beginning of October the same year).

In a cruel irony, 100 per cent of the test participants pointed to connected speech (with strong emphasis on "connected") as the greatest difficultly in understanding the pronunciation of native speakers of English. Dialectal variation ranked as the second difficulty with 28 per cent. Only one subject viewed connected speech favorably, calling it "their [i.e. native speakers' of English] natural way of speaking", as opposed to the prescriptive attitude of the vast majority of the students who labeled connected speech "careless" or even

"mumbling". One subject identified a discrepancy between connected speech and phonetics classes: "connected speech is not as clear as what is taught in class". The question prompted lengthy answers in which the students felt the urge to elaborate on the speed of native speakers of English: "sounds are not so clear", "it is hard to discern words", "there is a heavy dependence on pronunciation of vowels", "they drop a lot of sounds" etc. Also, the subjects specified their auditory impressions of connected speech as "shortening", "omission", "reduction", "short forms" and the like. In the questionnaire, the students of English unanimously voiced an opinion that connected speech accounts for difficulties and misunderstandings; while, in pretest they failed to make use of their knowledge to remedy the problem they themselves identified so accurately.

5. Conclusions

The study makes a contribution to the discussion of instructional methods of teaching processes of connected speech, using a good-sized and a coherent group of speakers as well as implements acoustic analysis instead of auditory impressions. As for L1, Polish has not been previously examined in the context of production and perception of connected speech. The results obtained in the study of production, perception and acquisition of connected speech justify three conclusions:

Conclusion one
The results obtained in the study are mixed: on one hand, IM has greater instructional value than the deductive instruction in a Polish EFL classroom, albeit with no temporal effects of IM for selected processes of connected speech. On the other hand, there is lack of much difference in gains between the two types of instruction as the deductive instruction also led to an improvement. Considering individual processes of connected speech, i.e. weak forms, elision and assimilation, IM was more effective only in production, whereas perception was not boosted by IM at all. The deductive instruction exhibited higher effectiveness in improving those processes of connected speech which involve consonants (elision and assimilation) in comparison with IM.

Conclusion two
Production and perception of connected speech among Polish learners of English, prior to any treatment, was poor in light of the pretest. 30 per cent of speech material in the pretest phase (i.e. in the perception part of the test) was not understood at all. It appears that in pretest, the EFL Polish learners of English experienced severe lack of comprehensibility, understood here as "the listener's experience of how difficult the speech is to understand" (Munro, 2011: 9). This necessitates stronger emphasis on connected speech in

pronunciation pedagogy in a Polish classroom and calls for shifting focus from drilling segments to listening activities exercising weak forms, assimilation and elision.

Conclusion three
Instead of pursuing the transfer hypothesis, pronunciation pedagogy of connected speech should consider factors such as place/manner of articulation, phonetic similarity of distribution and context as well as the nature of change.

6. Implications for further research

The relative merits of inductive and deductive approaches to language instruction have demonstrated here little overall difference in the effectiveness but the study manages to highlight how linguistic background should be taken into account when designing language learning methods. However, the study is not devoid of shortcomings which should be addressed in the future. Firstly, the speech considered was not fully spontaneous, the subjects read a list of 15 sentences. Differences between read and spontaneous speech have already been reported for L1: de Silva et al. (2003) found higher frequency of occurrence of elision and assimilation processes in spontaneous speech than in read aloud speech for Finnish, Russian and Dutch. The present study closely followed Abe's (2010) method in using read aloud speech but in future, eliciting a narrative from the subjects in the production part might be well worth pursuing. In fact, Saito and Lyster (2012) have already done so for segments: "the impact of FFI on learners' interlanguage development was apparent not only at a controlled-speech level but also at a spontaneous-speech level, suggesting that FFI can promote not only development of a new metalinguistic representation of English /ρ/ but also its internalization in a learner's L2 developing system" (Saito and Lyster, 2012: 626). Another possible direction for further studies would be verifying the lasting effects of the two methods by conducting posttest 2 after a longer period of time than six weeks, e.g. after six months or even twelve months. Finally, listeners' ratings may serve as an assessment tool instead of a binary method, used in this study.

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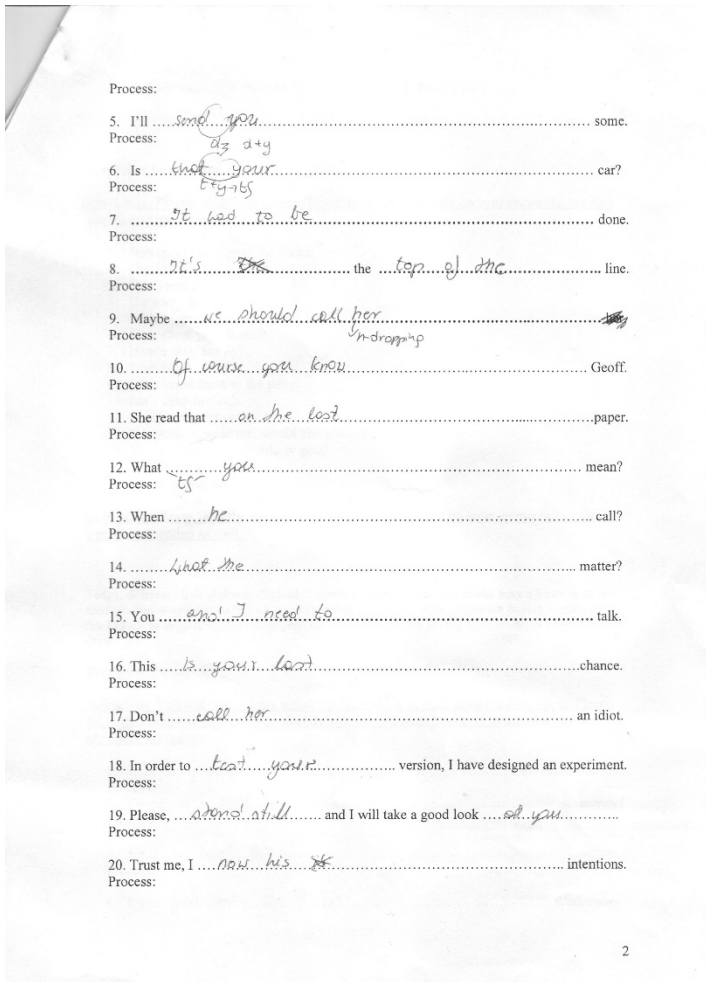
Appendix 1
The production test (the processes are bolded, weak form=WF, assimilation=A and elision=E)

1. Bob spen**t h**is summer in Wales. (E)
2. **Can** I help **you**? (WF)
3. Don'**t y**ou think so? (A)
4. Get **a**way **from** me. (WF)
5. He lef**t** jus**t** now. (E)
6. How abou**t y**our friend? (A)
7. How's **your** fa**mily**? (A)
8. I **can** see it. (WF)
9. Let's invite **them to the** par**ty**. (WF)
10. Le**t**'s keep in touch. (E)
11. Should'**t h**e be notified? (E)
12. Stop screaming at me, woul**d y**ou please? (A)
13. That play wasn'**t** particularly good. (E)
14. We'll mi**ss y**ou. (A)
15. Where'**s y**our book? (A)

Appendix 2
The perception test

1. A**s y**ou say, the plane was late. (A)
2. Could you len**d** me some money? (E)
3. He had **h**is turn. (E)
4. I **can** only do **it on** Wednesday. (WF)
5. I'll sen**d y**ou some. (A)
6. Is tha**t y**our car? (A)
7. **It** has **to be** done. (WF)
8. **It's the** top **of the** line. (WF)
9. Maybe **we should** call her. (WF)
10. Of cour**se y**ou know Geoff. (A)
11. She read that in the las**t** paper by Flege. (E)
12. What di**d y**ou mean? (A)
13. When did **h**e call? (E)
14. Wouldn'**t** it matter? (E)
15. You **and** I need **to** talk. (WF)
16. This is your last chance.
17. Don't call her an idiot.
18. In order to test your version, I have designed an experiment.
19. Please, stand still and I will take a good look at you.
20. Trust me, I know his intentions.

An exemplary perception test:



Process:

5. I'll ....send you..... some.
Process: dʒ d+y

6. Is .....that your..... car?
Process: t+y→tʃ

7. .....It had to be..... done.
Process:

8. .....It's ~~the~~..... the ....top of the..... line.
Process:

9. Maybe .....we should call her..... ~~they~~
Process: n-dropping

10. .....Of course you know..... Geoff.
Process:

11. She read that .....on the last.....paper.
Process:

12. What .....you..... mean?
Process: tʃ

13. When .....he..... call?
Process:

14. .....What the..... matter?
Process:

15. You .....don't I need to..... talk.
Process:

16. This .....is your last.....chance.
Process:

17. Don't .....call her..... an idiot.
Process:

18. In order to ...test.....your..... version, I have designed an experiment.
Process:

19. Please, ...don't ...ll..... and I will take a good look ....at you.....
Process:

20. Trust me, I ....now his ~~is~~..... intentions.
Process:

2