

An empirical study on the role of metacompetence in the acquisition of foreign language phonology

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ABSTRACT

The paper starts with a critical review of empirical studies on the role of explicit instruction in pronunciation. Then it reports on the preliminary results of the author's investigations into the effectiveness of a specially designed 12-week pronunciation programme exploring the role of metacompetence in the acquisition of foreign language phonology. The study demonstrates patterns of change in oral performance and perception on pre-test / post-test measures and verifies the hypothesis that conscious knowledge of phonological processes leads to the formation of mental representations and facilitates self-organisation of a new phonological system as predicted by acquisition models formulated within the framework of Natural Phonology.

1. INTRODUCTION

In spite of a growing interest in the teaching of pronunciation, there is limited empirical evidence that one type of formal instruction is particularly advantageous or that any form of instruction is beneficial for the learner at all. The present study is an attempt to respond to the urgent need for carefully designed investigations into specific instructional practices as advocated by several authorities in the field of pronunciation teaching [9]. The basic underlying assumption of the study is that pronunciation improves through gradual monitoring of an acquired system based on metacompetence, i.e. conscious knowledge of the grammar of a language and its different aspects, including phonetics and phonology.

2. REVIEW OF EMPIRICAL RESEARCH

The results of empirical studies that have been conducted with a view to investigating the effectiveness of formal pronunciation instruction are fairly inconclusive. The most widely quoted studies demonstrating the lack of positive effects of formal training on attainments in pronunciation include Purcell and Suter [10,12]. In an attempt to determine predictors of pronunciation accuracy the researchers concluded that only 4 variables; the first language, aptitude for oral mimicry, length of residency in an English-speaking country, and concern for pronunciation

accuracy were capable of accounting for the variability in subjects' pronunciation accuracy scores. None of predictors measuring different aspects of formal training proved to be significant in explaining variability in pronunciation accuracy.

However powerful in terms of statistical analysis, the study suffers from certain shortcomings. First of all, the ratings were performed on a rather subjective, impressionistic scale and accuracy alone was taken as a measure of pronunciation performance at the exclusion of fluency whereas the two seem to be closely interrelated. Furthermore, the twenty predictors that were selected for the analysis represent in fact different measures of a smaller number of underlying variables and could be reduced to a more limited set to avoid unnecessary confusion and some overlap. Finally, strong claims were put forward with regard to the futility of formal pronunciation instruction, however, the nature and quality of the formal training in English pronunciation the students had received was not evaluated at all and the research design was based entirely on self-reported data.

The aforementioned findings are counterbalanced by a number of studies providing evidence for positive effects of explicit instruction on various aspects of pronunciation skills including individual segments, prosody, aspects of connected speech or overall fluency. Macdoland, Yule and Powers [8] investigated various effects of different types of instruction including traditional drilling, self-study in a laboratory, interactive activities (i.e. modified interaction and negotiation of meaning), and no-intervention in a control condition. It appeared that some form of instruction may have an impact on pronunciation performance, however, no single intervention was beneficial to all learners and the findings were far from conclusive. The experiment suffered from some limitations such as a small number of participants and a very short intervention interval (i.e. a single session). An interesting contribution, however, is the discussion of the range of patterns of change which were brought about by the four different input types.

Another contribution is a long-term study by Derwing, Munro, and Wiebe [2], which compared different perspectives on pronunciation teaching including a

narrow approach (with a focus on segmental accuracy), a broad, global framework (focus on prosodic features and general speaking habits) and no pronunciation-specific instruction as a control condition. The findings showed improvement in all aspects of oral production (i.e. comprehensibility, accent and fluency) as a result of instruction. Furthermore, the study demonstrated that different focus of instruction had an impact on the results - in the case of spontaneous speech the only clear evidence of improvement was in the global group. The experiment was carefully designed and implemented without any visible flaws. The focus of the study, however, was not on a particular method or approach, but rather the scope of contents of the pronunciation instruction.

In a series of experiments Dziubalska-Kolaczyk [5] investigated the effectiveness of acquisition of foreign language phonology in different contexts, focusing, however, primarily on phonostylistic processes. The results point to the effectiveness of instruction in a formal setting, since only those learners demonstrated some productivity with respect to phonostylistic processes used in new contexts. Also Zborowska [14] reported statistically significant improvement both in the production and perception of fast speech processes due to regular formal training.

As it transpires from the presented overview of empirical studies on pronunciation instruction the results are not fully conclusive. Nonetheless, there is a considerable, though not overwhelming empirical evidence that explicit instruction exerts a positive influence on the acquisition of foreign language phonology. The existing discrepancies can be attributed to some flaws in experimental design (e.g. a short intervention interval) and different types of instructional treatment that was administered. The present study is an attempt to provide more convincing evidence for measurable effects of pronunciation instruction by using a special procedure in a long-term experimental setting.

3. THEORETICAL ASSUMPTIONS

The objective of the present study is to test the assumption that metacompetence is a determinant of L2 pronunciation achievements, i.e. the learners who are subject to theoretical training in phonetics and phonology outperform those who did not receive such input. It is hypothesised that conscious knowledge of phonological processes leads to the formation of mental representations and facilitates self-organisation of a new phonological system. The hypothesis is based on the premises of Natural Phonology as originated by Stampe and Donegan [3, 11] and further developed by Dressler [4] and relies, in particular, on the weak hypothesis of language acquisition and on the predictive

phonology acquisition models formulated within this framework [6, 7, 13].

Metacompetence is expected to facilitate the process of foreign language teaching and to be conducive to the development of learners' L2 competence. Due to metaknowledge of L1 and conscious knowledge of L2, the interference from L1 can be easier eliminated or neutralised. It is anticipated that explicit theoretical instruction will be beneficial for more effective acquisition of L2 phonology, as conscious teaching of phonological processes aids our perception and facilitates the formation of adequate representations.

4. STUDY ON METACOMPETENCE

The present section reports on a 12-week training programme conducted among first year students of English at the Teacher Training College in Poznań, Poland. The study aimed at investigating the effectiveness of explicit instruction in pronunciation and, in particular, the role of theoretical training (metacompetence) in the acquisition of foreign language phonology. To this end, 31 students participated in a specially designed practical pronunciation course that provided training in both receptive and productive skills, and covered segmental and suprasegmental features. The experimental and the control groups were subject to the same training, the only difference being that the former received additional theoretical instruction in English phonetics and phonology involving articulatory descriptions, classification of consonant and vowel systems, elements of contrastive analysis and other exercises aimed at raising students' meta-awareness.

The participants formed a fairly homogeneous group of adults at an intermediate and upper-intermediate proficiency level, studying in a full-time EFL programme and ranging in age from 19 to 25 years, with a mean age of 21 years. Their L2 input prior to the experiment included formal schooling in English and ranged from 5 to 13 years, with an average of 9 years. Only 36.5% of the participants spent some time in English-speaking countries and their mean length of stay was 18 weeks. The participants were randomly assigned to one of 2 groups balanced for number of students. Pronunciation was trained in a focused programme in isolation from other skills for 4 hours a week and covered 50 teaching hours.

The evaluation instrument used to assess participants' pre and post-treatment performance was divided into four subtests; one for perception and three for production. Perception was assessed with the aid of the Oxford Placement Listening Test 1 [1]. The test consisted of 100 sentences with minimal pairs of words or phrases which differed phonemically or phonostylistically. The participants' task consisted in ticking one of the alternatives provided in brackets

which was recognised by them while listening to the sentences recorded on a tape.

The production test consisted of speech sample recordings of three subtests; reading a list of 50 words or short phrases (subtest 1), reading a dialogue (subtest 2), and extemporaneously produced speech (subtest 3). The samples were digitally recorded and saved as audio files on a PC computer at 22 kHz with 16-bit resolution using CoolEdit 96 software.

The design of the production test allowed for task-related variability (i.e. more focused reading of the list of words vs. less focused reading of the dialogue vs. free speaking). The performance in reading in general was assumed to be more accurate as participants' attention focused mostly on form, whereas the speaking performance concentrated more on content with lesser control of the phonetic output of production.

5. DISCUSSION OF RESULTS

In order to determine the overall effect of formal instruction in pronunciation a T-test for dependant variables was performed comparing pre-test and post-test scores for each group separately. Tables 1 and 2 list the descriptive statistics for subjects of the experimental and control groups along with differential scores indicating change in pronunciation ability from the beginning to the end of the experiment (app. 12 weeks).

A significance level $p < .05$ applies in all analyses.

Table 1 T-test - Pre-test vs. post-test – **Experimental group** (N = 15)

TESTS		Mean	S.D.	Chng.	S.D. Chng.	t	p
LIST	Pre	13.67	7.32				
	Post	36.53	7.21	-22.87	3.44	-25.74	.00
DIAL	Pre	4.33	1.76				
	Post	6.60	1.76	-2.27	.80	-10.99	.00
SPEE	Pre	4.60	1.18				
	Post	5.80	1.21	-1.20	.68	-6.87	.00
PERC	Pre	80.15	3.36				
	Post	83.46	4.61	-3.31	4.59	-2.6	.02

- LIST - list of words and phrases
- DIAL - dialogue reading
- SPEE - speech
- PERC - perception

Table 2 T-test - Pre-test vs. post-test – **Control group** (N = 16)

TEST		Mean	S.D.	Chng.	S.D. Chng.	t	p
LIST	Pre	19.75	8.13				
	Post	35.69	6.29	-15.94	5.40	-11.81	.00
DIAL	Pre	5.38	1.78				
	Post	6.69	1.62	-1.31	.95	-5.55	.00
SPEE	Pre	5.63	1.36				
	Post	6.50	1.21	-0.88	.62	-5.65	.00
PERC	Pre	81.31	4.38				
	Post	85.75	5.80	-4.44	4.16	-4.26	.00

T-tests within each group indicate that both groups made significant gains ($p < .05$) from their pre- to post-test performance on all measures. The differential scores were statistically significant pointing to a visible improvement in all aspects of oral production (i.e. list reading, dialogue and speech) and perception as a result of explicit instruction.

In order to verify the main hypothesis of the experiment which predicted that the experimental group would outperform the control as a result of the treatment, i.e. metalinguistic training, a T- test for independent variables was carried out (Table 3). Statistically significant results were obtained in the case of three variables: Production Subtest 1 (LIST) $p = .00$, Production Subtest 2 (DIALOGUE) $p = .005$, and vowel recognition test VRT $p = .035$. However, for the Production Subtest 3 (SPEECH) and the PERCEPTION test the results were not significantly different from chance ($p = .17$ for the former, and $p = .26$ for the latter).

Table 3 T-test - **Experimental vs. control group**

	Control Group N=16		Experim. Grp. N=14		t	df	p
	Mean	S.D.	Mean	S.D.			
LIST	15.94	5.40	22.87	3.44	-4.23	29	.000
DIAL	1.31	.95	2.27	.80	-3.02	29	.005
SPEE	.88	.62	1.20	.68	-1.40	29	.173
PERC	4.44	4.16	2.43	5.50	1.14	28	.265
VRT *	52.13	6.22	60.54	13.72	-2.21	28	.035

* VRT – Vowel Recognition Test

These findings partially support the hypothesis that developing metacompetence facilitates the acquisition of foreign language phonology. Statistically significant results were obtained, as expected, in more form-focused tasks, i.e. reading of a list and a dialogue (subtests 1 and 2), at which the experimental group equipped with articulatory declarative knowledge

outperformed the control, which relied solely on procedural knowledge. Metalinguistically competent language learners were able to monitor their form-focused (controlled) production better, thus demonstrating the effectiveness of the theoretical training.

In the speech subtest 3, in turn, the participants' attention was focused mostly on content and not so much on the phonetic output, yielding results that did not significantly put any of the groups at an advantage. This test aimed at investigating transfer of consciously acquired competence to performance in the form of free production. Nonetheless, deviant L2 performance does not always signify that the underlying mental representation is also deviant. It may mean that the newly learnt L2 phonological process or item is not significantly automatised yet or that a relevant processing mechanism is inaccessible. The present findings did not show any statistically significant influence of the treatment on perception. The transfer of underlying competence on the level of perception can also be only hypothesised about on the basis of surface phenomena.

6. CONCLUSIONS

The present study demonstrated that the subjects' overall phonetic accuracy significantly improved over time due to intense explicit pronunciation training. As metacompetence has proved to be quite a significant determinant of pronunciation attainment, an important implication for foreign language teaching would be to supplement practical pronunciation training with theoretical instruction in phonetics and phonology aimed at developing metalinguistic awareness.

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