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Pronunciation of /P/ and /F/ by Korean Learners of English

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Linguists have observed that learners of foreign languages who share a common native language often experience a characteristic set of pronunciation problems. For example, German speakers tend to have difficulty with English /ch/ and /sh/, while French speakers may confuse /s/, /t/, and /th/, and Spanish speakers frequently have trouble with /b/and/v/. Korean learners of English are prone to errors in the use of /p/ and /f/, producing forms such as 'tof of the fafer' for 'top of the paper' or 'pish' for 'fish'.

The success of efforts by teachers of English as a foreign or second language (EFL/ESL) to help students improve their pronunciation may depend upon an accurate knowledge of the pattern of errors. Most observations by teachers and linguists about learners' pronunciation problems have been intuitive and qualitative, but little quantitative analysis has been done. This has meant, for example, with Korean learners, that whereas we know that students confuse /p/ and /f/, we are not sure where errors are most likely to occur. As a result of this incomplete knowledge, teachers may concentrate on some areas of perceived difficulty, effort which might be better spent on other, more serious problems.

This study is a quantitative analysis of the patterns of error in the production of English /p/ and /f/ by a group of Korean university freshmen. We wanted to compare the relative frequency of error among

different environments within words. We also wanted to examine the relationships between accuracy of pronunciation of /p/ and /f/ and overall academic proficiency; performance in the Freshman English Conversation course (measured by a mid-term listening test); and speaking fluency. Finally, we wished to look at the relationship between the level of error for /p/ and that for /f/, in similar linguistic environments.

Two approaches to the analysis of learners' errors in acquiring a second language, contrastive analysis (CA) and error analysis (EA) are particularly relevant to the study presented here.

CA, popularized by Fries, Lado and other structural linguists, maintains that a systematic comparison between the native language (NL) and the target language (TL) is the most productive and scientific way to predict the mistakes of the learner. What Ronald Wardhaugh calls the 'strong' version of the hypothesis states that:

...the change that has to take place in the language behavior of a foreign language student can be equated with the differences between the structure of the native language and culture and that of the target language and culture. The task of the linguist... is to identify these differences. (1970 : 7)

Thus, according to the strong version of CA, it is possible to predict second language learning difficulties by contrasting the grammatical, phonological, and lexical systems of one language with those of another. However, Wardhaugh points out that linguists have yet to develop the comprehensive set of linguistic universals that such a complete description of the two languages would require (1970 : 8). He goes on to say that many linguists have presented contrastive statements about the phonemic systems of two languages without asking whether it is possible to do so with procedures which relate, for example, an English /p/ to a French /p/, merely because linguists have chosen to symbolize some ill-defined similarity between the two languages by the letter 'p'.

If we do not have an adequate phonological theory nor a complete

description of the two languages being compared, the requirements of the strong version of CA are being disregarded. Therefore, a more tenable approach for researchers who seek to explain second language learning difficulty would be to abandon CA, at least in its strong form, for a different approach to the data.

According to Wardhaugh, (1970 : 10) the weak version of CA requires only that the linguists use the best linguistic knowledge available in order to account for observed difficulties in second language learnina. It does not require prediction of what the difficulties will be. The starting point in the contrast is provided by actual evidence of learning problems such as residual foreign accents, and reference is made to the two systems only to explain actually observed phenomena. This, the *a posteriori* approach, was used in our study in an attempt to account for observed errors in pronunciation. CA was considered appropriate because, according to Richards (1971 : 197) it has proved to be most useful at the level of phonology.

Error Analysis

Error analysis (EA) examines empirically the errors in the target language (TL) produced by second language learners and seeks to identify the cause of the errors. Proponents of this approach make no *a priori* predictions of learner difficulty. Instead, the errors in the TL are analyzed, and where appropriate, are attributed to differences between the NL and the TL, overgeneralization, or other sources. A learner's errors are regarded as systematic, and as evidence that the learner is using a definite system of language at all stages of development, although this system is not the TL. Corder(1967 : 168) draws an important distinction between systematic errors which are a product of the LAD (language acquisition device) at work (Chomsky, 1965) and random or performance errors which do not reflect the current state of the learner's acquired knowledge of the TL.

Selinker maintains that some of the errors a second language learner

makes are *intralingual*. Intralingual errors are those caused by the intrinsic difficulties of the structures being acquired and not by interference factors such as the NL. He also claims that the process of fossilization in the latent psychological structure of the learner can explain many intralingual errors (1972 : 177). Fossilizable linguistic phenomena are linguistic items, rules, and subsystems which speakers of a particular NL will tend to keep in their interlanguage (IL) relative to a particular TL (1972 : 177). Selinker claims that fossilizable structures tend to remain as potential performance and reappear "when the learner's attention is focused upon new and difficult intellectual subject matter or when he is in a state of anxiety, excitement, or... extreme relaxation" (1972 : 178).

Selinker proposes five central processes which might cause a learner's errors: language transfer, transfer of training, strategies of second language (L2) communication, strategies of L2 learning, and overgeneralization. (1972 : 179).

Since our study attempts to locate and explain errors, it will be useful to look at Selinker's typology of errors more closely. Language transfer, sometimes known as interference, is a process whereby rules, lexical items, or subsystems from the NL occur in the IL. If error is a result of identifiable training procedures we are dealing with transfer of training. If error is the result of an identifiable approach by the learner to communication in the TL we are dealing with strategies of L2 communication. Errors which result from an identifiable approach by the learner to the TL material to be learned, are attributed to strategies of L2 learning. Finally, error resulting from extension of features of the TL to other items or rules is attributed to overgeneralization of linguistic material (1972 : 179). We were able to use Selinker's typology in suggesting explanations for some of the errors made by the subjects in this study.

While EA has much to offer researchers that CA cannot, it has its weaknesses. Selinker advises caution in explanation of error; identifying error types is one thing, but being able to say an observed error is

unambiguously caused by one of the above mentioned processes is much riskier (1971 : 183).

One problematic area for EA researchers is in using error frequencies to identify points of difficulty in the TL. The assumption is that points of difficulty in the TL are indistinguishable from points at which errors are frequent. However, it may be that learners avoid producing constructions that they find too difficult (Kleinmann, 1977). Nevertheless, as Schachter (1974 : 361) observes, it is quite possible that avoidance behavior does not occur in the acquisition of the phonological system of the TL, because the learner has no recourse to paraphrase, as is the case in the acquisition of syntax. What this means is that the relative frequency of phonological errors is more likely to reflect the relative difficulty of these items for the learner. This paper does not seek to refute or support the claims of Error Analysis or for either version of the Contrastive Analysis hypothesis. Rather the authors have used an eclectic approach, seeking to explain the observed behavior of Korean learners of English on the basis of the knowledge gained from teaching experience and intuition, and drawing upon the insights offered by CA and EA.

Korean /p/, /p'/, and /p^h/ and English /p/ and /f/

A brief look at the relevant subsection of Korean phonology is necessary to an understanding of our study. Korean has three consonant phonemes similar in some ways to English /p/ and /f/: /p/, /p'/, and /p^h/, represented in the Korean writing system as and and described by the Korean linguist Kim Wan-Jin as lenis, fortis, ㅍ, ㅑ, and ㅑ, aspirated respectively (Kim, 1983 : 158). These phonemes are all bilabial. Aspiration and subglottal pressure are phonemic distinctions but voicing is not. The allophonic distributions of these Korean phonemes are given in Figure. 1 and may be contrasted with the allophonic distributions of English /p/ and /f/, given in Figure 2.

Figure 1: Allophonic Distributions of Korean Phonemes /p/, /p'/, and /p^h/

ㅂ	/p/	[-b]/V-V	[nabi] 'butterfly'
		[-p]/V-#	[pap'] 'cooked rice'
		[-p] elsewhere	[pul] 'fire'
ㅃ	/p'/	[-p'] everywhere	[p'ul] 'horn'
		except in syllable final position	
ㅍ	/p ^h /	[-p ^h] everywhere	[p ^h ul] 'grass'
		except in syllable final position	

Figure 2: Allophonic Distributions English Phonemes of /p/ and /f/

/p/	[-p]/-#	top
	/s-	spirit
	V-V°	operate
	[-p ^h]/#-	picture
	/-#	clap
	/V-V'	appear
	[-p]/-C	collapse
	/-#	up
/f/	[f]/everywhere	fire, suffer, after, off

KEY

C =consonant

[p'] =high subglottal pressure

V° =vowel

[p^h] =aspirated

V =unstressed vowel

[p] =unreleased

V' =stressed vowel

Method

As has been noted above, the Korean language has three bilabial phonemes, (/p/, /p'/, and /p^h/) which are similar to the English phoneme /p/, but lacks the labiodental /f/. Because of this difference between the phonological systems of Korean and English, it can be predicted that Korean students will have difficulty in correctly pronouncing English words containing /p/ and /f/, and experienced teachers of English (Robson, 1982) have in fact observed that Korean students often confuse the two sounds. The study described here was designed to find the

pattern of errors made by a group of students in the pronunciation of English words containing the two phonemes.

Subjects

The subjects of the study were 50 Korean university pre-medical students enrolled in intermediate level freshman English conversation classes taught by a native speaker of English. Since English is a required subject in middle and high schools in Korea, all subjects had received at least six years of instruction in English before entering the university.

Data Elicitation

Data used in the study were taken from individual cassette tape recordings of each subject's response to a diagram description task, based on tasks designed by Gillian Brown (Brown and Yule, 1983). Students were assigned to pairs at random and pairs were seated in adjacent booths in a language laboratory. Student A was given a diagram and Student B a blank sheet of paper. Student A then told Student B how to draw the diagram, recording the instructions on tape as Student B drew. Then, the roles were reversed, with Student B receiving a different diagram and recording the instructions given to Student A. Partners were allowed to speak to each other during the performance of the task, but only the responses of the instruction-giving partner were recorded on tape. Twenty minutes was allowed for completion of each task. Students had previously received fifty minutes of classroom instruction and practice in doing a similar task. One of the diagrams used in the description task is reproduced, as an example, in Appendix 1.

Compilation of the Data

Each of the three researchers two Americans and one Korean, all of whom are experienced teachers with advanced degrees in linguistics,

listened to each of the fifty tape-recorded speech samples. For each sample, the rater completed a checklist, noting all occurrences of /p/ or /f/ in English words. Thus, there were three checklists per subject. For each occurrence of /p/ or /f/, the raters noted how the sound should be pronounced in English (Ideal Pronunciation); whether the sound was /p/, /pf/, or /f/ (Actual Pronunciation); whether the pronunciation was right or wrong (Correctness); and what the position of the sound was within the word (Environment). Biographical data for each subject was also entered on the checklist, along with the subject's score on three measures:

- 1) University Entrance Examination score - a test of general academic proficiency.
- 2) English Midterm - a multiple-choice listening progress/proficiency test administered during the English Conversation course.
- 3) Holistic Score - a global measure of speaking ability on the diagram description task (mentioned above), used originally as part of the grade for the freshman English Conversation class, and administered prior to the beginning of the study reported here. Two American teachers listened to each taped speech sample, assigning a score from one to ten, and the two scores were then averaged.

An example of the checklist is given in Appendix 2.

The first question addressed in the study was whether there were differences in the rate of error in pronouncing /p/ versus that for /f/. That is, does the level of difficulty seem to be greater for one phoneme than for the other? Secondly, we were interested in finding out whether there were differences in the rate of error among the sixteen different phonemic environments which were used to categorize the occurrences of /p/ and /f/ (see Checklist, Appendix 2).

In order to arrive at the error rate for each phoneme and each environment, it was necessary to first compile the information on the Checklists into a usable form. Some discrepancies were observed among the three sets of checklists, so a procedure to ensure the reliability of the data was devised.

Reliability of Scores

A random sample of five subjects was drawn to determine the reliability of scoring the subjects' responses on Total Number of Words, Actual Pronunciation, Correctness, and assignment to environment by raters (Roscoe, 1975). An inter-rater reliability measure was calculated for each of the four categories as measured by the three scorers, because all of the scores were criterion referenced.

The percent agreement was adequate for total number of words; the range across subjects and scorers was 91% to 99%, with a mean of 95%. Assigning words to environments was not a problem; the range was from 90% to 100% with an average of 98%. For this measure, disagreement occurred only for one subject. Several words were repeated, and scorers could not agree on whether or not some sounds were part of particular words.

The other two measures yielded lower reliability estimates. Correctness had an agreement range of 68% to 94%, with a mean of 82%. Actual Pronunciation had a range from 50% to 91%, with a mean of 75%. These problems in inter-rater reliability may be due to several different factors. One Korean and two Americans scored the responses and there was some difference in the way the two nationalities determined the scores. This can be seen in the average percent agreement scores within and between nationalities. For Actual Pronunciation, the two Americans agreed 80% of the time, while between nationalities figures averaged 72%. Similarly, figures for Correctness averaged 90% and 78% respectively; so the language orientation of the scorer may have affected these two measures. Another factor is that the pronunciation and correctness measures actually form continua; /p/ gradually becomes /f/, and a word may be more or less correct, adding to measurement error.

To deal with the reliability problem, it was decided to have all three scorers score all of the protocols independently, then to compile a master data sheet containing scores agreed upon by at least two of the three scorers. Thus only one set of scores was used, compiled from the

opinions of three independent scorers. It was also decided that it was too difficult for the raters to agree on whether a sound was a /p/, an /f/, or a /pf/, and so in evaluating the pronunciation of the students the raters decided to use only the Correctness protocol.

Analysis of the Data

Using the master data sheets, the total number of occurrences of /p/ and /f/ in the entire corpus of fifty speech samples was calculated for each of the sixteen phonemic environments. It was found that, for eight of the environments (/p/ in environments 3, 4, 5, 13 and 15; and /f/ in environments 9, 12 and 14) the number of occurrences was too small to warrant analysis. For the remaining eight environments (/p/ in environments 1, 2, and 6, and /f/ in environments 7, 8, 10, 11, and 16) the average percentages of correct responses for the corpus as a whole were calculated.

These eight environments were then ranked according to the average percentage of correct responses, from highest to lowest, for all subjects taken together. Results of this analysis are shown in Figures 3A and 3B.

In order to determine whether there were any differences in performance between those students who showed high overall proficiency in speaking English and those of lower proficiency levels, the subjects were divided into two groups, according to their score on the teachers' holistic assessment of the speech samples. These scores were whole numbers, ranging from 4 to 10, so students with scores of 6 or less were assigned to the low-proficiency group, and those with scores of 7 or more to the high-proficiency group. The average percentage of correct responses per environment for each of the two subgroups is shown in Figure 4.

In addition to determining whether there were any differences in the error rate (Correctness) among phonemic environments, we wanted to answer several research questions by investigating the relationships between the five pairs of variables listed below.

- 1) University Entrance Test score and Percentage Correct in pronouncing /p/ and /f/.

Question: Is there a linear relationship between general academic ability and accuracy of pronunciation?

- 2) Midterm Listening Examination Score and Percentage Correct in pronouncing /p/ and /f/.

Question: Is there a linear relationship between listening ability and accuracy of pronunciation?

- 3) Holistic Diagram Description Score and Percentage Correct in pronouncing /p/ and /f/.

Question: Is there a linear relationship between overall speaking ability and accuracy of pronunciation?

- 4) Percentage Correct for Environment 1 (#p) and Percentage Correct for Environment 7 (#f).

Question: Is there a linear relationship between the degree of accuracy in pronouncing /p/ at the beginning of a word and that in pronouncing /f/ in the same position?

- 5) Percentage Correct for /p/ and percentage Correct for /f/.

Question: Is there a linear relationship between accuracy in pronouncing /p/ and accuracy in pronouncing /f/?

The Pearson Product Moment Correlation were calculated for each of the five pairs of variables. As no predictions about the relationship between the variables had been made in advance, the research hypotheses were nondirectional. The null hypotheses was that the correlation between the two variables equaled zero, so two-tailed tests were used.

Because of the exploratory nature of the research, we were prepared to take a fairly high risk of rejecting a null hypothesis which was in fact true, so it was decided to set the overall level of significance at .1. However, since two of the variables, Percentage Correct in pronouncing /p/ and /f/ and Holistic Diagram Description, were used in more than one correlation, the overall alpha level (level of significance) was divided by 5 (the number of correlations done), to yield a level of .02 for each separate correlation.

The variation in the size of the N is due to the fact that, for some of the correlations, scores on both variables were not available for all 50 subjects. The N for the correlation between percentage Correct, Environment 1, and Percentage Correct, Environment 7, is much smaller than that for the other correlations because only those subjects who used both word-initial /p/ and word-initial /f/ were included. Results of the Pearson Product Moment Correlation are shown in Figure 5.

Results and Discussion

Results and Discussion of the Comparison Among Eight Environments

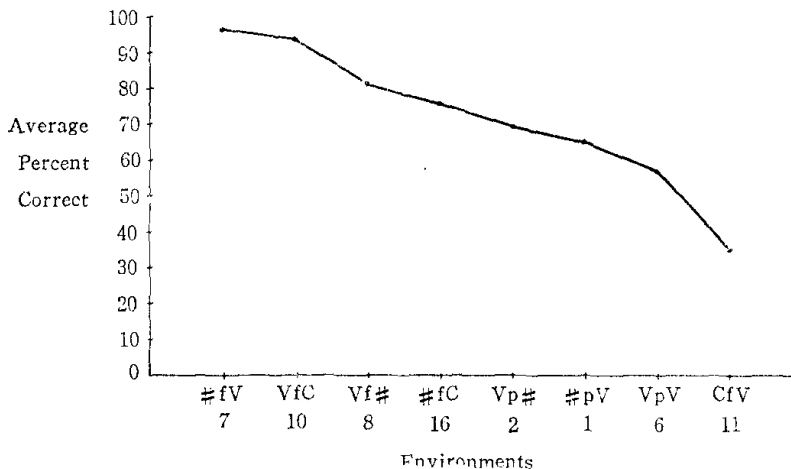
When all subjects were considered together, it was found that, in general, fewer errors were made with /f/ than with /p/. The environments used in the comparison are listed in Figure 3A below, ranked from highest to lowest for percentage correct. Figure 3B is a graphic representation of shows the differences in percentage of correct responses among environments.

Figure 3A: Errors Per Environment (All Subjects)

Total Occurrences	Total Correct	Total Correct	Percentage Correct	Rank
#fV	198	191	96.46	1
VfC	213	200	93.89	2
Vf#	38	31	81.57	3
#fC	100	76	76	4
Vp#	43	30	69.76	5
#pV	148	97	65.54	6
VpV	117	67	57.26	7
CfV	17	6	35.29	8

For all environments but one, /f/ was pronounced correctly a higher percentage of the time than /p/. The high percentage of error for CfV may be due to transfer of training. The only use of CfV was in the word "alphabet", and since Korean schools place a heavy emphasis on

Figure 3B: Percentage of Correct Responses per Environment
(All Subjects)



reading English, students may confuse the letter “p” in “alphabet” with the phoneme /p/.

Our data and theoretical tools allow us to offer, at best, only tentative explanations of the pattern of error by comparing the structures of English and Korean, but an examination of the results of the comparison among environments does reveal a number of plausible interpretations. At first sight the higher percentage of correctness for /f/ than for /p/ may seem surprising, because, as noted before, the Korean language has bilabial phonemes similar to /p/ but does not have any labiodental fricatives like /f/, so that one might expect students to have less difficulty with /p/. However, this similarity in bilabiality between English /p/ and the Korean phonemes /p/, /pʰ/, and /p̚/ may not facilitate learning, because it is possible, as Briere observed, that it is easier for people to learn a completely new phoneme which does not exist in their native language than to learn a partially similar class in the target language (1966 : 768).

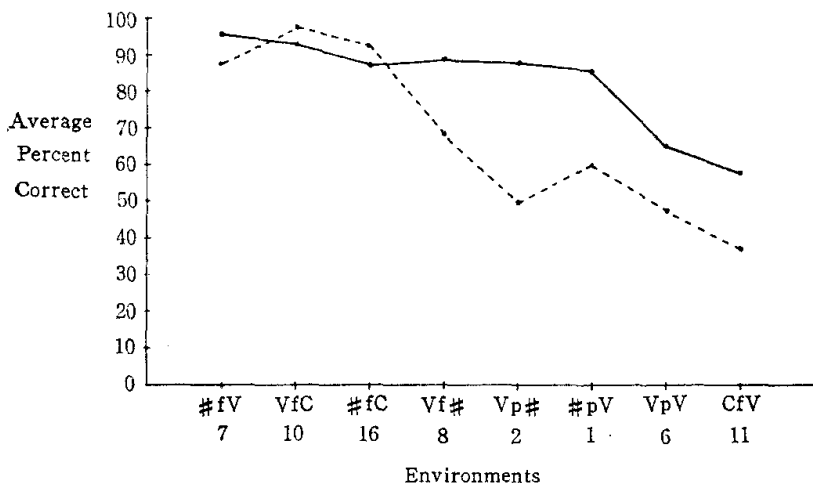
The lower percentage of correctness for /p/ than for /f/ may also be caused by in part by overgeneralization of /f/ to environments where

/p/ should occur, a simplification of the target language.

Aspiration is a phonemic distinction in Korean, but an allophonic distinction in English. This difference between English and Korean sometimes causes confusion for Korean students of English. The Korean sound system includes phonemic oppositions between highly aspirated, unaspirated, and subglottalized sounds. Lightly aspirated sounds, like the English word-initial or intervocalic /p/, are absent from Korean, hence easily confused by the Korean learner. It may be that /f/, one of the most heavily aspirated sounds in English, is in some ways the nearest sound to the Korean /p^h/. Hence, students may overgeneralize English /f/ sounds to /p/.

Our results show that students make a higher percentage of error for word-final /f/ than for /f/ in most other environments. One possible explanation of this phenomenon is that, of the three phonemes

Figure 4: Percentage of Correct Responses per Environment



(ranked according to the responses of the high-proficiency group)

_____ Responses of students with scores of more than 6/10 on the diagram description task.

..... Responses of students with 6/10 or less.

/p/, /p'/ and /pʰ/, only /p/ can occur in word-final position in Korean. It may be conjectured that interference has occurred, transferring the /p/ phoneme of Korean to English /p/ and /f/ in word-final position. Another explanation might be the fact that Korean /pʰ/, which is similar to English /f/ in the feature of aspiration, cannot occur at the end of a word. Conversely, if positive language transfer has taken place, word-final /p/ should have a relatively high rate of correctness, and, indeed, the data indicate that of the environments where /p/ was used, the highest rate of correctness occurred in word-final position.

Figure 4 reveals some interesting differences between the high proficiency(HP) and low proficiency(LP) subgroups of subjects. The Average Percent Correct in pronouncing /p/ and /f/ was higher for the HP group than for the LP group in all environments except numbers 10(VfC) and 16(#fC), where the positions of the two subgroups were reversed. However, the difference in Percent Correct between the two groups in those two environments was small.

Because pre-medical students in general are quite a homogeneous group, characterized by high academic achievement, we had not expected to find such a marked difference between two groups divided solely on the basis of their score on a holistic measure of speaking fluency. The divergence between the two groups on Average Percent Correct suggests that there is a quantifiable relationship between fluency and accuracy of pronunciation, and it is noteworthy in this regard that the Pearson Product Moment Correlation between Holistic Diagram Description scores and Percentage Correct for /p/ and /f/ does approach significance.

Results and Discussion of the Correlations

For all five correlations, the P-values obtained were nonsignificant, and the null hypothesis was retained. That is, the correlations were not high enough to justify accepting the hypothesis that there is a linear relationship between the paired variables.

It is interesting to note that, for three of the correlations, P-values

Figure 5: Pearson Product Moment Correlations for Five Pairs of Variables

Variable	N	Mean	Standard Deviation	Pearson R	Probability (two-tailed)
1. x: Univ. E. T.	47	270.17	9.77	-.052	.999
y: %C /p/, /f/	47	79.84	19.3		
2. x: M. Exam	50	89.02	9.61	.115	.999
y: %C /p/, /f/	50	79.51	18.79		
3. x: Diag. Desc.	50	6.62	1.18	.308	.055
y: %C /p/, /f/	50	79.51	18.79		
4. x: %C Env. 1	29	70.62	34.64	.417	.046
y: %C Env. 7	29	94.79	19.38		
5. x: %C /p/	49	62.83	37.09	.066	.999
y: %C /f/	49	90.82	14.91		

Key

Univ. E.T. = University Entrance Test Score

%C /p/, /f/ = Percentage of Correct Responses using /p/ and /f/

M. Exam = Midterm English Listening Exam Score

Diag. Desc. = Diagram Description Score

%C Env. 1 = Percentage of Correct Responses Using Environment 1

%C Env. 7 = Percentage of Correct Responses Using Environment 7

%C /p/ = Percentage of Correct Responses Using /p/

%C /f/ = Percentage of Correct Responses Using /f/

are extremely high (.99). Thus, there seems to be no demonstrable linear relationship whatever between accuracy of pronunciation of the two phonemes in question and either academic ability, as measured by the University Entrance Test, or successful performance in the freshman English Conversation course, as measured by the Midterm Examination.

For the remaining two correlations, those between Holistic Diagram Description and Percentage Correct for /p/ and /f/, and between Percentage Correct for /p/ and Percentage Correct for /f/, on the other hand, P-values are much lower, and in fact approach significance. These results suggest some directions for future research.

Directions for Future Research

One interesting study would be to investigate the relationship between holistic assessment of spoken English and correctness of pronunciation by obtaining speech samples from learners of English and having one naive native speaker of English(not a teacher) assign holistic scores, and another naive native speaker score the correctness of selected phonemes(/r/ and /l/, for example). The two sets of scores could then be correlated.

Another very useful research project would be a direct continuation of the research reported in the present study on the relationship between phonemes. Because we used naturalistic speech samples, we were able to get enough data for only one correlation between different phonemes (/p/ and /f/) in analogous environments (word-initial, Environments 1 and 7). A future project could use data elicitation methods which would generate enough examples of both /p/ and /f/ to enable the researcher to perform correlations between the two phonemes in other environments(e.g., word-final, intervocalic).

Conclusion

It is hoped that this preliminary study, by pointing out some specific areas where pronunciation problems are likely to occur, may prove useful to teachers of English to Koreans in preparing lessons to meet the needs of their students more precisely. We are convinced that quantitative studies of pronunciation have great potential for application to curriculum design and development of teaching materials, and hope that our work may motivate others to undertake such research projects in the future.

Acknowledgements

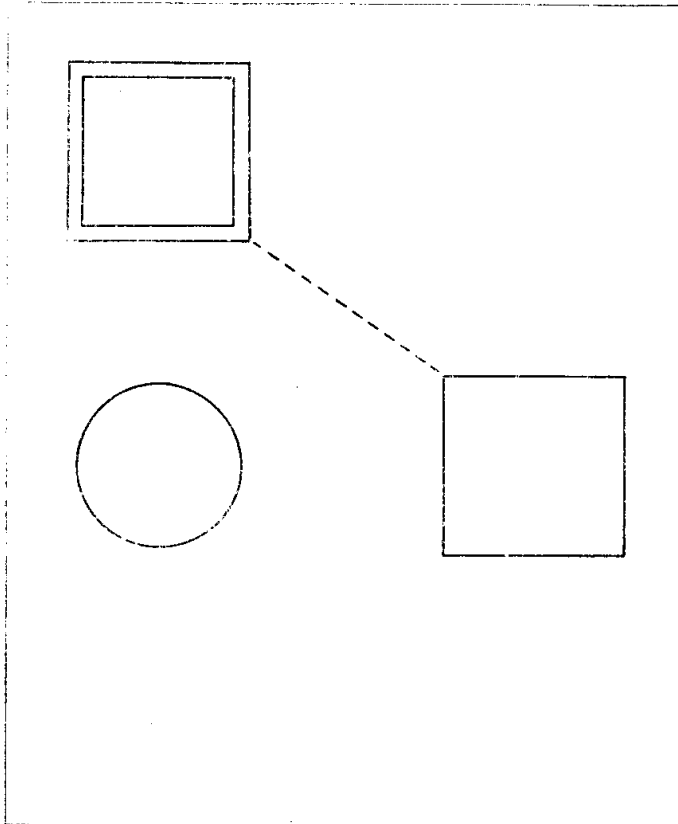
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References

- Briere, E.J. 1966. 'An Investigation of Phonological Interference.' *Language*, 42, 4, 768-796.
- Brown, G., & G. Yule. 1983. *Teaching the spoken language*. Cambridge: Cambridge University Press.
- Chomsky, N., & M. Halle. 1968. *The Sound Pattern of English*. New York, N.Y.: Harper and Row.
- Chomsky, N. 1965. *Aspects of the Theory of Syntax*. Cambridge, Mass: MIT Press.
- Corder, S.P. 1967. 'The Significance of Learners' Errors.' In Robinett and Schachter(eds.) 1983.
- Duskova, L. 1969. 'On Sources of Errors in Foreign Language Learning.' In Robinett and Schachter(eds.) 1983.
- Elzey, F.F. 1985. *Introductory Statistics: A Microcomputer Approach*. Monterey, CA: Brooks/Cole Publishing Co.
- Gatbonton, E. 1978. 'Patterned Phonetic Variability in Second Language Speech: A Gradual Diffusion Model.' In Robinett and Schachter (eds.) 1983.
- Hatch, E., & J. Wagner Gough. 1976. 'Explaining Sequence and Variation in Second Language Acquisition.' In Robinett and Schacher(eds.) 1983.
- Kim, W., 1983. 'Phonological Structure of the Korean Language'. In Korean National Commission for UNESCO, (ed.) *The Korean Language*. Seoul: UNESCO.
- Kleinmann, H.H., 1977. 'Avoidance Behavior in Adult Second Language Acquisition.' In Robinett and Schachter (eds.) 1983.

- Lado, R. 1957. 'Procedures in Comparing Two Grammatical Structures.' In Robinett and Schachter (eds.) 1983.
- Richards, J.C. 1971. 'A Noncontrastive Approach to Error Analysis.' In Robinett and Schachter (eds.) 1983.
- Robinett, B.W. & J. Schachter (eds.). 1983 *Second Language Learning: Contrastive Analysis, Error Analysis, and Related Aspects*. Ann Arbor: University of Michigan Press.
- Robson, B. 1982. 'Teaching English Pronunciation to Speakers of Korean.' *FOCUS*, 11, (pp.1-8). Arlington, VA: National Clearinghouse for Bilingual Education.
- Roscoe, J.T. 1975. *Fundamental Research Statistics for the Behavioral Sciences*. New York: Holt, Rinehart and Winston, Inc.
- Schachter, J. 1974. 'An Error in Error Analysis.' In Robinett and Schachter (eds.) 1983.
- Schachter, J., & M. Celce-Murcia. 1971. 'Some Reservations Concerning Error Analysis.' In Robinett and Schachter (eds.) 1983.
- Selinker, L. 1972. 'Interlanguage.' In Robinett and Schachter (eds.) 1983
- Trager, E.C. 1982. *PD'S In Depth*. Culver City, CA: ELS Publications.
- Wardhaugh, R. 1970. 'The Contrastive Analysis Hypothesis.' In Robinett and Schachter (eds.) 1983.

Appendix 1: Sample Diagram Used in Data Elicitation Task



Appendix 2:

DATA CHECKLIST

Researcher's Name	Diagram Number	3
Master	Student's Number	
	Student's Name	
	Sex	M
	Univ. Entrance Exam. Score	254
	English Midterm	93
	Teacher's holistics core	4
	Layman's holistic rating	
	Total No. of words	80

	Item	Ideal Pronunciation			Actual Pronunciation			Correctness		Environ- ment Num- ber
		/p/	/f/	other	/p/	/f/	other	Corr- ect	Inco- rrect	
1	paper									1
2	paper									6
3	left									10
4	upper									6
5	left									10
6	five									7
7	point									1
8	five									7
9	put									1
10	alphabet									11
11	from									16
12	four									7
13	upper									6
14	left									10
15	from									16
16	left									10
17	five									7
18										
19										
20										
Totals								13	4	

Total Incorrect/Total Occurrence×100=23.53%
 Total Mistakes in /p// Total Ideal /p/×100=50%
 Total Mistakes in /f// Total Ideal /f/×100=91%

Environment No.	/p/		Environment No.	/f/	
	Correct	Incorrect		Correct	Incorrect
1 # V	2	1	7 # V	4	
2 V #			8 V #		
3 C #			9 C #		
4 V C			10 V C	4	
5 C V			11 C V		1
6 V V	1	2	12 V V		
13 C C			14 C C		
15 # C			16 # C	2	

<국문초록>

한국 대학생들의 영어 /p/와 /f/ 발음의
습득에 관한 연구

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한국 학생들이 영어로 말을 할 때 /p/와 /f/ 발음을 혼동하는 경우가 흔히 있다. 본 연구는 한국 학생들이 영어를 습득하는 과정에서 어떤 경우에 /p/와 /f/ 발음을 혼동하는지를 찾아 내고, 그 오류를 분석하고 또 학교 성적과 발음과의 상호 연관관계도 조사 하였다. 오류분석은 영어와 한국어의 음성학 구조의 차를 고려하였고, 여러 상관관계는 통계학적 방법을 도입하였다. 자료는 50명의 한림대학 의예과 1학년 학생을 대상으로 'Diagram Description Task' 실험을 이용하여 학생들의 /p/와 /f/ 발음을 시험하면서 녹음 테이프를 얻었다. 그 결과는 예상했던 것과는 달리 한국어에는 없는 /f/ 발음에는 별 문제가 없었으나 /p/ 발음을 /f/로 발음하는 경우가 더 많은 것으로 나타났다. 그러나 대학 입학 학력고사 성적, 교양영어 듣기 시험 성적, 말하는 능력과 발음과는 상호 의미있을 만큼의 상관관계는 없는 것으로 나타났다.