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Analysis and Interpretation of ELD/CS Project Test Results

(English Language Development/Cued Speech)

After Nine Months of Training

English Language/Speechreading/Speech Tests

In reporting and interpreting these test results several issues need careful consideration regarding our students' improvement in their knowledge and use of the English language. In second-language study there are two aspects: 1) a "knowledge" aspect and, 2) a skills aspect. This dual nature of language study is clearly reflected in the two types of work engaged in by students in language classes: 1) the study of grammar and vocabulary and 2) the practice of reading, writing, and speaking. The grammar and vocabulary of the target language are, in the conventional sense of the term, "teachable" (although the task of "learning" is that of the students alone, since teachers cannot learn anything for students). Reading, writing, and, speaking are not in the conventional sense of the term, "teachable" (although general principles can be isolated, explicated, and demonstrated). The ability to read, write, and speak cannot in any real sense of the term be "taught", for reading, writing, and speaking involve skills, and skills cannot be taught--only acquired. Thus, once again, it is the students who, if they are to improve in reading, writing, and speaking must acquire the requisite skills, since teachers cannot acquire skills for students.

The "learning" of grammar and vocabulary are pre-requisite to and thus must precede the acquisition of (improved) reading and writing skills. It is a common observation to all who work in any skills-acquisition area that a high degree of attainment requires not only intense effort and practice over an extended period of time but also a high level of aptitude, or talent, on the part of those attempting to acquire the skills in question.

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And candor requires the recognition of the fact (no matter how distasteful and how much we might wish it to be otherwise) that not all people possess in the same degree the requisite aptitude for the acquisition of a given skill. Thus, in the realm of second-language teaching to hearing students it is well recognized by all language teachers who are at all honest with themselves that not all second-language students are equally apt for high attainment in the use of their target language, nor is their degree of "success" at all uniform. (Even in the realm of native language use, not all native users are equally skillful readers and writers.) Indeed, even being native to a language does not in and of itself assure even "adequate", let alone "superior" reading and writing skills, as witness the large number of native speakers who are, if not illiterate, at least poor in the reading and writing of their natively internalized language. And these facts, so clear with respect to native users of a language and to hearing adult second-language students, cannot be less clear with respect to adult second-language students who are deaf. Therefore, varying degrees of improvement are to be expected, depending upon whether knowledge or skill is being tested and the instruments which are used to measure progress.

Similarly, in judging the improvement of speech intelligibility of hearing-impaired adults, several factors need to be considered. If spontaneous speech is being used for the analysis, the process of formulation may interfere with the motor acts of speech or it may be difficult to discern which errors are due to language difficulty and which are due to a malfunction in the speech mechanism. If read material is used, the intended message is clear, but there are other aspects to consider. First, if the length of the passage is too long, it can overshadow intelligibility improvement if the student can not yet sustain his new speech patterns for the required length of time. Secondly, the complexity of the grammar may interfere, because if the students' are unfamiliar with the grammar patterns, he may spend an inordinate amount of mental effort

attempting to understand what he is reading rather than concentrating on speech production. Thirdly, if the vocabulary is not in the student's repertoire, he is likely to mispronounce the unfamiliar words. And lastly, the prosodic features and articulation of speech need careful consideration as in any analysis of connected speech.

MEASUREMENT

The English language evaluation consisted of the English Placement Test developed at Gallaudet College, which is administered to all incoming freshmen and preps of Gallaudet College. It includes a free writing sample, and vocabulary, grammar structure, and reading subtests. In addition, the vocabulary, reading, and sounds-in-words subtests of the S.A.T. (Standard Achievement Test) and the structure and vocabulary subtests of the C.E.L.T. (Comprehensive English Language Test) were also given.

For speech and speechreading, the following procedures were used. The speechreading test consisted of a videotaped presentation of sets of the C.I.D. Everyday Sentences presented first without sound, then with sound. For the speech evaluation, I chose a stimulus of two sets of ten sentences which are phonetically balanced, containing vocabulary and grammar which were easily managed by our students. For my phoneme analysis, I chose to use Articulatory Valve Analysis (Hillis, unpublished), an instrument that yields a "percent of phoneme error", along with diagnostic information about the physiologic place for articulatory error. One set of ten sentences was read by the students and analyzed in April, 1982; in December, 1982, the second set of ten sentences was read as the post test. In this way, the students were similarly unfamiliar with each list at the time of testing.

Since it is almost impossible to objectively rate prosodic features of speech, I have concentrated on the "percentage of phoneme error" to rate intelligibility, since, to date, it is a variable which is closely related to speech intelligibility and is more sensitive to students with low intelligibility than subjective intelligibility measures. The intelligibility curve is a rising slope, with very little being understood by the listener until about 80% of all phonemes are correctly articulated, regardless whether the error is one of pronunciation or articulation. The curve rises sharply after that point, with speech with 90% or more of phonemes correctly articulated being highly intelligible (Hillis, 1973). See Tables 1 and 2.

SUBJECTS

The subjects were five students in the English Language Development/Cued Speech Project (ELDCS). The students were recent graduates of Gallaudet College, and were taught English using Cued Speech as the mode of communication and an English as a Second Language (ESL) curriculum developed at Gallaudet College. They also received daily individual speech therapy sessions of one-half hour each day.

RESULTS

The English Language Test results are shown on Table 3.

The Speechreading Test results are shown on Table 4.

The Speech Test results are shown on Table 5.

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TABLE 1

Proportion of Phonemes
Articulated Correctly

Intelligibility Rating

.00 - .50

1. Completely unintelligible: no part of the discourse can be understood.

.51 - .71

2. Virtually unintelligible: only a word here or there can be understood.

.71 - .82

3. Mostly unintelligible: some meaning can be understood and the general meaning of some sentences can be grasped.

.83 - .90

4. Borderline intelligible: the general meaning of most sentences can be grasped.

.91 - .97

5. Mostly intelligible: the general meaning of the entire discourse can be grasped.

.98 - .99

6. Easily intelligible: the entire discourse can be readily understood although there are a few misarticulations.

100

7. Completely intelligible.

TABLE 2

8.1.10

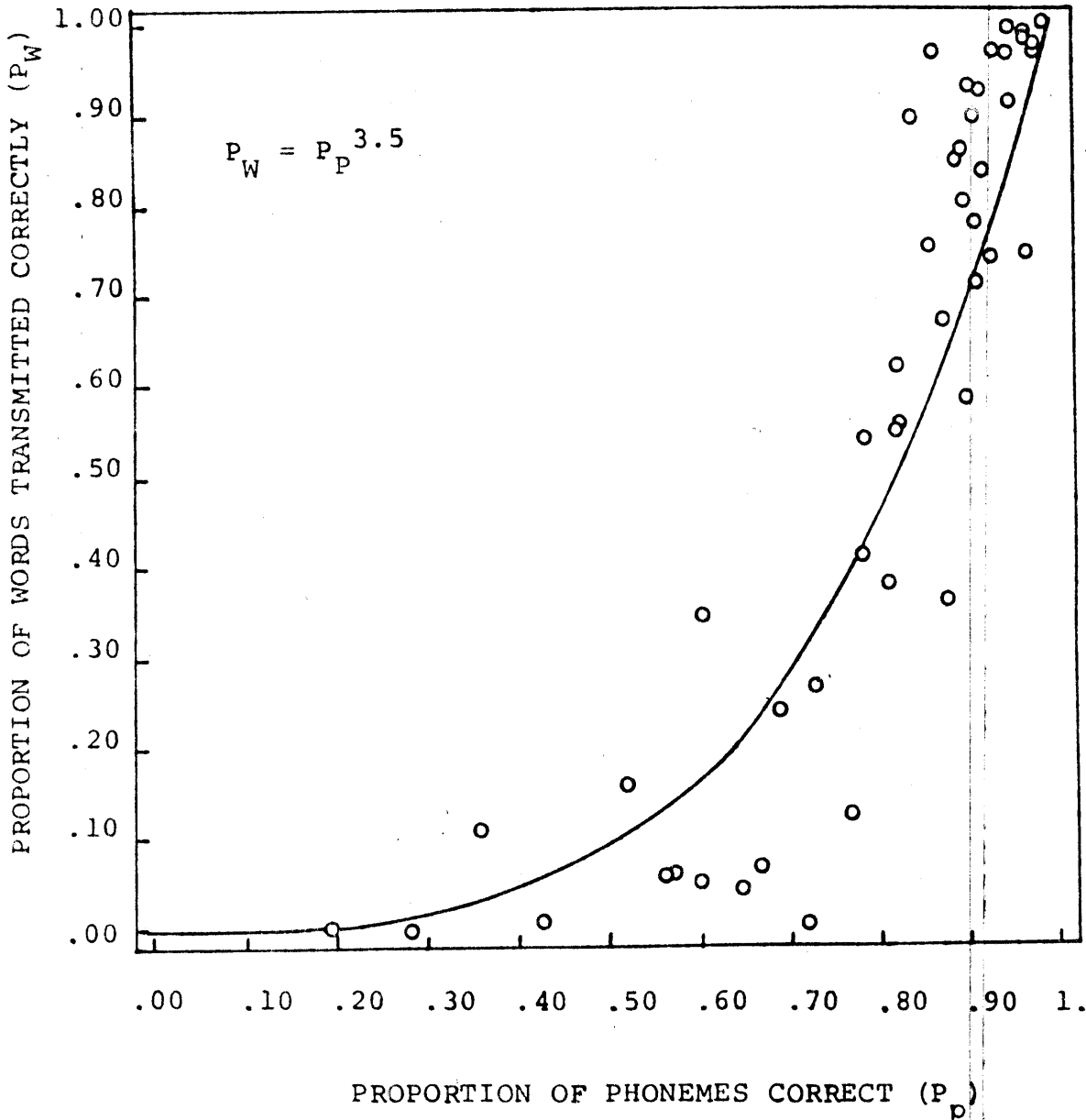


Figure . Relationship between proportion of phonemes correct on a contextual articulation test and proportion of words transmitted correctly to listeners on a write-down intelligibility test.

-(Hillis, 1973, unpublished)

TABLE 3

English Language Test Results

	Student #1		Student #2		Student #3		Student #4		Student #5	
	1/82	11/82	1/82	11/82	1/82	11/82	1/82	11/82	1/82	11/82
EPT Voc. (70 pass)	84	87*	59	65*	66	73*	71	78*	61	73*
SAT Voc. (grade equivalent)	10.0	10.4*	6.0	6.5*	5.5	4.9-	6.0	5.7-	6.3	5.8-
CELT Voc. (percent correct)	79	79o	57	76*	51	60*	61	61o	75	75o
EPT Str. (115 pass)	132	145*	129	127-	113	132*	98	122*	115	121*
CELT Str. (percent correct)	65	80*	49	59*	41	51*	40	51*	57	72*
SAT Sound (percent correct)	68	96*	16	44*	68	80*	36	56*	60	84*
EPT W/S (3.5 pass)	2.2	3.2*	2.2	2.4*	2.0	3.0*	2.3	3.2*	2.6	2.7*
EPT Reading (48 pass)	55	54-	36	37*	39	42*	35	42*	44	50*
SAT Reading (grade equivalent)	10.9	10.7-	7.6	6.0-	6.5	6.4-	7.7	6.8-	5.4	4.8-

Key: * upward trend
 - downward trend
 o remained the same

TABLE 4

Speechreading Test Results

	Speechreading Without Sound		Profile		Speechreading With Sound		Profile	
	1/82	11/82	1/82	11/82	1/82	11/82	1/82	11/82
Student #1	56%	52%-	2	2o	38%	54%*	3	2*
Student #2	6%	14%*	5	5o	8%	6%-	5	5o
Student #3	20%	38%*	4	3*	28%	34%*	3	3o
Student #4	38%	38%o	3	3o	26%	40%*	4	3*
Student #5	52%	60%*	2	2o	64%	70%*	2	1*

TABLE 5

Speech Test Results
expressed in "percentage of phoneme error"

	4/82	12/82
Student #1	5%	5%o
Student #2	68%	28%*
Student #3	17%	5%*
Student #4	69%	56%*
Student #5	44%	15%*

Key: * upward trend
 - downward trend
 o remained the same

INTERPRETATION

A. English Language

When examining the results of any given set of second-language tests, the only reasonable question to ask concerning a student's performance in a language program is this: do the results show improvement in the students' understanding of how the target language works; that is, do they reveal improvement in their knowledge of grammar and structure, the "teachable" aspect of language study. And while individual performances on the recently administered tests vary, and while the results on several of the tests are apparently conflicting, the general trend in the grammar and vocabulary tests suggests that the project students are laying the necessary foundation for the possible future acquisition of improved skill in reading and writing.

But more than that, the present test results suggest that the students' improved knowledge of grammar and vocabulary is already beginning to lead to improvement in the free writing skills, these results showing an upward trend in every case (if only minimally so in two cases). Moreover, the dramatic improvement that all the students made on the "sounds" subtest of the SAT Test shows that the students have not only improved in their graphic recognition of vocabulary, but also in their knowledge of the phonemic image of the words as well. This skill is helpful in receiving and expressing spoken English, as you might guess. This is directly related to the Cued Speech aspect of our project.

As to the reading test, although once again the results seem contradictory (four out of five students showing some improvement on the reading section of the English Department's Placement Test while on the SAT Reading Test four out of the five seemed to go down), it is probably safe to assume that by and large our students have not to date acquired much, if any improvement in reading skills. This phenomenon is not in the least surprising; first, the project (by design) did not begin to include any formal work on reading until after the mid-project tests were administered; and second, reading skills are, in any event, always the last to develop--if they ever do, as witness once again the large numbers of native speakers who remain for life poor readers.

B. Speechreading

A general guide to help interpret the speechreading scores is as follows:

<u>Profile</u>	<u>Range</u>	
<u>Rating</u>	<u>%</u>	<u>Functional Descriptor</u>
1	70-100	client understands the complete message
2	52-69	client understands most of the content of the message.
3	28-51	client understands with difficulty about one-half the message (follows the gist of the conversation).
4	16-27	client understands little of the content of the message
5	0-15	client does not understand the message

Three out of five of our students made significant improvement in ant
their speechreading skills when the test was presented with sound, and one made
significant improvement when the test was was presented without sound. (That is,
improvement of one profile rating point.) This is especially noteworthy since
no direct speechreading training was given to the project students. So, four
out of five students made significant improvement in their speechreading
skills.

C. Speech

All the students, except one, showed marked improvement in
intelligibility as judged by "percent of phoneme error". The one student who
did not show m improvement, Student #1, was diagnosed at the onset of therapy as
having pronounced rhythm and duration difficulties with good phonetic and
phonological articulation skills. Student #4, who showed the second least
amount of improvement, had a substantial amount of absenteeism from class and
therapy due to illness. Students #3 and #5 were consistent in attendance and
motivation and improved their articulation skills significantly. And Student
#2, who showed the greatest improvement, had never used his voice for verbal
communication prior to the project, and with his outstanding motivation has made
remarkable improvement in his oral skills. But, it would be unrealistic to say,
even with the gains demonstrated by the students up until now, that all would be
understood clearly by an untrained listener. If one looks at the post-test
"percentage of phoneme error" scores, three out of five students are within the
"borderline intelligible" range or better, and the other two students are below
that level. However, significant, measurable improvement was made by four out
of five students in the parameter studied.

CONCLUSION

Since there was no control group or isolation of factors in this research project, it is impossible to determine which of the factors--Dr. Goldberg's E.S.L. curriculum, Cued Speech, or speech therapy-- was most important in assisting our students in improving their language knowledge and speech skills; but the combination of factors has proved profitable, and of that we are certain. We will be monitoring the students' progress for five more months and will report on additional improvement as further testing is done.

Respectfully submitted,

R. Orin. Cornett, Ph.D.

J. Philip Goldberg, Ph.D

Diane B. Potts, M.A., CCC/SP