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THE EFFICIENCY OF INTERPRETING INPUT FOR PROCESSING LECTURE INFORMATION BY DEAF COLLEGE STUDENTS

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California State University, Northridge (CSUN) offers an educational plan which served 171 deaf students who matriculated with approximately 28,000 hearing peers during the Fall Semester, 1976. Since the first two deaf students enrolled at CSUN in 1964, 48 have earned bachelor's degrees and 193 have earned master's degrees. CSUN's program is unique in that: (1) it is of a "mainstreaming" format; (2) it serves a large number of deaf students; and (3) it offers bachelor's and master's liberal arts degrees.

Support services administered by Campus Services for the Deaf enable deaf students to compete successfully within a large liberal arts university. These support services include counseling, tutoring, aural rehabilitation, notetaking, and interpreting.

How effective has the program been in assuring the academic success of deaf students within this integrated setting? In two studies using the criterion of grade point average (GPA), Murphy (1976) compared the total population of deaf students to equal numbers of randomly sampled hearing students at each class level. The results revealed that deaf students at CSUN received about the same grades as their hearing peers.

Grade point average is a relatively global measure of a dynamic process occurring over the span of a semester. It would seem that the short-term contributions of the individual support services could be isolated and considered separately. The support service of interest in this study was interpreting. Specifically, this study considered the effectiveness of interpreting to

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transmit information to students in the classroom lecture situation. This is a vital area of concern since the classroom lecture represents the "starting line" of the trek toward academic achievement.

How efficient is interpreting in transmitting lecture material to deaf college students for subsequent processing and immediate recall? CSUN and many other post secondary programs serving deaf students have been operating under the previously untested assumption that a deaf student recalls as much lecture information after watching the interpreter as his or her hearing peer does by listening to the lecture.

The purpose of this study was to determine the amount of interpreted lecture information deaf students were able to recall compared to the amount of lecture information recalled by hearing students through audition. The research question of interest in this study was: "Do deaf students score as high as hearing students on tests of immediate recall of short-term lecture content when the deaf students receive lecture information via interpreting and the hearing students via audition?"

Two comparison groups were used. Criteria for membership in each group was as follows:

A. Deaf students (n = 29).

1. Current enrollment in CSUN.
2. Good academic standing (GPA of 2.00 or better).
3. Functional knowledge of manual communication and documented use of interpreting service.
4. Documented hearing impairment.

Audiometric information was collected from the files of Campus Services for the Deaf. Of the 29 students who participated in the study, 27 had current audiograms on file. For these 27 students, the mean Better Ear Average hearing loss was 95.07 decibels.

B. Hearing Students (n = 12):

1. Current enrollment in CSUN.
2. Good academic standing (GPA of 2.00 or better).
3. No functional knowledge of manual communication.
4. No hearing impairment.

It was determined that there were no significant differences in cumulative GPA between the deaf and hearing groups used in the study.

Subjects were given six short, interpreted lectures, each followed by a 10-question, multiple choice examination of immediate recall.

The content of the six lectures was designed to meet the following criteria:

1. The material was representative of the three General Education Requirement areas at CSUN: Social Science, Natural Science, and Humanities.

Social Science.	1. Economics: "Money."
	2. History: "Francis Parkman."
Natural Science	3. Astronomy: "Pulsars."
	4. Geology: "Mt. Vesuvius."
Humanities	5. English: "Henry James."
	6. Art: "Walt Disney."

2. The information transmitted in each lecture was equally novel for each group, i.e., a person needed to attend to the lecture and could not call upon previously learned information to correctly respond to the questions.

3. The information was factually accurate. The source for all six lectures was the Encyclopedia Britannica (1974).

The test instrument was developed and refined through two pilot testings. Reliability estimates of these pilot tests ranged from .89 to .91.

Prior to the experiment, lectures were simultaneously rehearsed by the lecturer and interpreter to assure the following conditions:

1. The rate of presentation was uniform.
2. All factual information stated by the lecturer was also communicated by the interpreter.

The sign language system used by the interpreter was a combination of Signed English and American Sign Language, the system which is most commonly used by the interpreting staff at CSUN. Test instructions were read by the author and interpreted by the interpreter to all subjects. The interpreter was not aware of the 60 test questions.

A one-tail, independent groups t-test was used to test score differences between the hearing and deaf groups on each of the six subtests and total test score. All statistical analyses were subjected to prior tests for homogeniety of variance. Results indicated that the use of parametric techniques was appropriate. Analysis procedures which accounted for unequal sample size were applied.

Table 1 represents the results of the statistical analyses. As can be seen from Table 1, analyses revealed differences beyond the .05 confidence level for all the tests except History.

A comparison of combined test scores indicated that hearing students correctly answered about 83% of the 60 test items. Deaf students correctly answered about 69% of the 60 test items, or about 84% as many items as the hearing students correctly answered.

Table 1

ANALYSES OF TEST RESULTS OF HEARING AND DEAF SUBJECTS COVERING SIX TOPIC AREAS AND COMBINED SCORE

Topic Areas	Groups	X	S.D.	t	p
Art	Hearing	8.58	1.38	2.55	.025
	Deaf	7.21	1.97		
Economics	Hearing	7.50	1.73	2.19	.025
	Deaf	6.17	1.85		
Astronomy	Hearing	7.17	1.34	2.92	.005
	Deaf	5.69	1.76		
English	Hearing	9.00	.74	2.66	.001
	Deaf	7.34	2.09		
Geology	Hearing	8.92	1.77	3.07	.005
	Deaf	7.38	2.26		
History	Hearing	8.75	1.77	1.29	.10*
	Deaf	7.90	2.26		
Combined Score	Hearing	49.92	5.99	3.50	.005
	Deaf	41.69	8.57		

*Not significant at the .05 level.

Discussion

This study attempted to determine the amount of lecture information deaf students were able to recall compared to the amount of lecture information recalled by hearing students. It was a departure from previous studies of interpreting efficiency since in this case the efficiency of interpreting for deaf students was compared directly to the efficiency of audition for hearing students.

It was found that there were significant differences favoring the hearing student group on five of the six subtests and the combined test score. These differences indicate that deaf students had about 84% as many correct responses as their hearing counterparts. A reasonable assumption is that

interpreting is at least 84% efficient in conveying college lecture information to deaf students when compared to audition for hearing students. This 84% figure needs to be weighed in light of the following:

1. Considering the well-documented educational deficit of deaf people, it would not be unreasonable to assume that in reality the information was more novel to the deaf than the hearing students, thus giving the hearing students an advantage on correct responses.

2. The method of testing immediate recall (the multiple choice test) may have been favorably biased toward the hearing student who was more likely to have encountered this type of testing procedure in previous educational settings.

3. This study utilized the services of an interpreter who is recognized to be one of the best in the country. CSUN has over 100 part-time interpreters with varying degrees of experience and skill. Also, deaf subjects who participated in this study were those who had been using interpreting services in their college classes. It is not unreasonable to assume that information processing is directly related to both (1) the level of experience and skill of the interpreter, and (2) the amount of experience the deaf student has had in using interpreting services.

4. Murphy (1977) conducted a study of the efficiency of interpreting in which he controlled for the confounding variable of deafness with its concommitant language, educational, and experiential deficits. Using stimulus materials and test protocols identical to those used in the present study, he assessed the rate of information recall of interpreters with normal hearing and high receptive manual communication skills. It was found that the recall test scores of these skilled interpreters who received the information through interpreting alone (the audible portion of the presentation was deleted) was not significantly different from recall scores of hearing students who received the information through audition only. Considering Murphy's findings in the context of the present study, one might conclude that the efficiency differential may well be accounted for by the previously mentioned educational and experiential factors related to deafness.

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