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A comparison of performance by hearing-impaired children on two measures of receptive vocabulary

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A COMPARISON OF PERFORMANCE BY HEARING-IMPAIRED CHILDREN ON TWO MEASURES OF RECEPTIVE VOCABULARY

By

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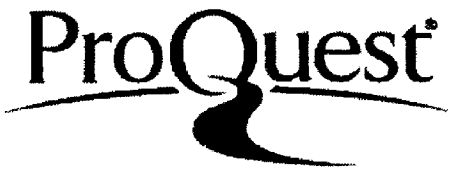

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A Comparison of Performance by Hearing-Impaired Children on two Measures of Receptive Vocabulary (59 pp.)

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The purpose of this study was to compare performance on two measures of receptive (comprehension) vocabulary, the Peabody Picture Vocabulary Test-Revised and the Total Communication Receptive Vocabulary Test. Ten subjects from the Montana School for the Deaf and Blind participated in this study. All subjects met the following criteria: severe-profound hearing loss, performance IQ of 80 or better, corrected vision to within normal limits, and no additional handicapping condition. Each subject was administered each of the two tests in total communication (simultaneous signing and speaking) on the same day.

Pearson r product moment correlational coefficients were used to compare raw scores between tests, age-equivalent scores between tests and age-equivalent scores to each child's chronological age. The results of this study indicated high correlational values for each of these comparisons (0.80 or above). Overall both raw scores and age-equivalent scores were higher on the TCRVT. This was attributed to the fact that this test was developed specifically for hearing-impaired children, while the PPVT-R was developed for normal hearing individuals.

An item analysis was conducted and revealed certain items were inappropriate for testing the vocabulary of hearing-impaired children. The results of this study suggested the mode of communication for test presentation, sign iconicity and the characteristics of the population being tested should be considered when measuring the receptive vocabulary of hearing-impaired individuals.

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This thesis is dedicated to the memory of my friend, Matthew Hansen, whose love of Montana brought me here.

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CHAPTER I: INTRODUCTION

Introduction

Hearing-impaired children are often reported to have vocabulary deficits (Silverman-Dresner & Guilfoyle, 1972; Streng, 1978; Trybus & Karchmer, 1977; Kretschmer, & Kretschmer, 1978; Quigley & Paul, 1984; Thompson, Biro, Vethivelu, Pious, & Hatfield, 1987). Several authors have attempted to explain these observed deficits. Howell (1984) proposed that hearing-impaired children learning language lacked vocabulary development because their hearing parents did not have the ability to teach new vocabulary. As a result, hearing-impaired children enter kindergarten with an average vocabulary of 158 words, while normal hearing children enter kindergarten with an average of 2,000 words (Howell, 1984). Kushe and Greenberg (1983) proposed another explanation for vocabulary deficits. They examined the development of the concepts of "good" and "bad" for 30 hearing-impaired and 30 normal hearing children. They found that hearing-impaired children were delayed in comparison to normal hearing children. Normal hearing children in their study understood the concept of bad by age 4, while hearing impaired children did not master this concept until age 6. Hearing children understood the concept of good at age six, while hearing-impaired children did not demonstrate knowledge of this concept until age 10. They suggested the delay resulted from language deprivation in the hearing-impaired child's

environment caused by the delay in establishing a communication system for the hearing-impaired child. They also observed that while normal hearing children absorb a wealth of language incidently, hearing-impaired children learn language only when it is directed specifically to them.

Vocabulary deficits are of concern to educators and other professionals working with hearing-impaired children because a child's vocabulary level influences his/her performance on tasks of reading comprehension. Traditionally, hearing-impaired children fall below normal hearing children in reading achievement (Furth, 1966; Trybus & Karchmer, 1977; Brooks, 1978).

An explanation for the poor reading performance of hearing-impaired children was proposed by Silverman-Dresner and Guilfoyle (1972). They pointed to the use of the reading materials that were based on vocabulary norms for normal hearing children. In an effort to develop vocabulary norms for hearing-impaired children, these authors administered vocabulary tests to 13,207 children between the ages of 8-17 at 89 schools for the deaf across the United States. From their results, four lists of words known by 62.5% or more of the children were compiled. To date these are the only published vocabulary norms for hearing-impaired children. These normative data should help educators of hearing-impaired children identify severe vocabulary deficits which warrant intervention.

In additon to normative data, a method of assessment is necessary to determine the presence of a vocabulary deficit. Assessment using standardized vocabulary tests is commonly used to determine the presence of vocabulary deficits for both normal hearing and hearing-impaired children. However, the instruments which are frequently used to measure the vocabulary of hearing-impaired children are often standardized on normal hearing individuals. The use of these standardized tests on hearing-impaired individuals raises several issues and concerns. The vocabulary words on the test may be selected from vocabulary norms for normal hearing children and as noted by Silverman-Dresner and Guilfoyle (1972), these test items may not be appropriate for hearing-impaired children.

Test administration must also be considered when administering vocabulary tests to hearing-impaired individuals. The test may be designed and standardized for oral administration, yet a percentage of hearing-impaired individuals are educated in sign language or simultaneous signed and spoken language (total communication). Problems arise if the test is administered according to the standardized presentation method. For example, if the standard presentation is oral, the child may be penalized by his/her inability to perceive the word auditorily. If the test presentation is modified to a written or signed presentation, the normative data provided in the test manual for oral presentation is no longer valid.

Another problem caused by presentation in sign language is that the vocabulary test may not control for the iconicity of some signs. An iconic sign bears a direct physical resemblance to the word it represents. For example, the sign for "elbow" is simply pointing to the elbow. If a standardized picture vocabulary test was presented in sign language, a child could conceivably select the appropriate answer on the test from this sign without knowledge of the vocabulary word. The test would then be measuring sign to picture association rather than comprehension of vocabulary.

Finally, a test that is standardized on normal hearing individuals may also be insensitive to differences which may be inherent to the acquisition of language by hearing-impaired individuals. Most of the literature suggests that hearing-impaired children acquire language in a similar sequence to normal hearing children. However, the phenomenon of "plateauing" has been observed for hearing-impaired children (Forde, 1977; Bunch & Forde, 1987). Plateauing is described as a period in which the child shows language growth followed by a period of no growth (a plateau). Vocabulary tests developed for hearing individuals are designed to measure vocabulary growth in incremental steps. The test may be insensitive to subtle changes in a hearing-impaired child's vocabulary during the plateau and therefore fail to show incremental increases in the hearing-impaired child's vocabulary.

Two tests which were designed to measure receptive (vocabulary comprehension) vocabulary are the Peabody Picture Vocabulary Test-Revised (PPVT-R) (Dunn & Dunn, 1981) and the Total Communication Receptive Vocabulary Test (TCRVT) (Scherer, 1981). For these tests, the child's knowledge of vocabulary is assessed by identification of a line drawing representing a given vocabulary word in response to a spoken or signed presentation of the word. The PPVT-R was designed to test vocabulary for normal hearing individuals. The PPVT-R is sometimes used to test the vocabulary of hearing-impaired individuals (Forde, 1977; Bunch & Forde, 1987). The administration of the PPVT-R to hearing-impaired individuals often requires modifications in the test presentation from an oral presentation to a written or signed presentation.

The Total Communication Receptive Vocabulary Test was designed for hearing-impaired individuals. Limited normative data are provided for use of this test with normal hearing individuals. Although both of these tests can be used to measure receptive vocabulary for hearing-impaired individuals, very little research exists on their use with the population of hearing-impaired children. To date, there has been no comparison of performance between these two tests for the same group of individuals, whether the subjects have normal hearing or are hearing impaired. Therefore, it cannot be determined if the tests are measuring similar levels of vocabulary.

The purpose of this study was to compare the performance of a group of hearing-impaired children from the Montana School for the Deaf and Blind on each of these tests.

Description of the Tests

The Peabody Picture Vocabulary Test (PPVT) was originally developed in 1959 and the first set of norms were developed from a population of 4,012 white, normal hearing individuals in and around Nashville, Tennessee. (Bracken, Prasse, & McCallum 1984). The test consisted of 150 stimulus words for each of two forms of the test, forms A & B. Receptive knowledge of vocabulary words was measured by the child's ability to select the appropriate word from a group of four pictures. A raw score was derived from the number of correct responses between a basal and a ceiling item. This could then be converted to an I.Q. and Mental Age Score.

In 1981, The PPVT was revised and renormed. This revision included newer line drawings, the addition of twenty-five items for two forms of the test (forms L & M), and test pictures including a broader representation of minorities and women. The PPVT-R was then normed on a sample 4,200 normal hearing individuals representative of the United States population as per the 1970 census. For the PPVT-R, standard score equivalents and age equivalents replaced the PPVT I.Q. and Mental Age. Scores could be obtained for individuals between the ages of 2 years, 6 months and 33 years, 8 months (Bracken et al.,1984).

The Total Communication Receptive Vocabulary Test was developed to test vocabulary of hearing-impaired individuals. The test design is similar to that of the PPVT-R. The individual selects the tested item from a plate of four pictures, but the test is presented using total communication (simultaneously signing and speaking). A raw score is derived from the number of correct responses between the first item adminstered and the point at which there are five consecutive errors, or the "ceiling". This score can then be converted to an age equivalent score. This test contains seventy-five test plates of four pictures each and was standardized on 251 deaf (hearing loss of 85 dB HL or greater) children between the ages of 3-12 years; 95 hard of hearing (hearing loss of 35-58 dB HL) children between the ages of 4-11 years, and 77 normal hearing children between the ages of 3-5 years. Age level scores are provided for each of these three groups.

Review of Previous Research

Three studies have investigated the use of the Peabody Picture Vocabulary Test and the Peabody Picture Vocabulary Test-Revised with the hearing-impaired population (Hedger, 1965; Forde, 1977; Bunch and Forde, 1987). Hedger, 1965 compared performance by 150 orally trained hearing-impaired children at the Lexington School for the Deaf on the Peabody Picture Vocabulary Test, forms A and B, with performance on the Ammons Full Range Vocabulary Test (Ammons & Ammons, 1948) and the Van Alstyne Picture Vocabulary Test (Van Alstyne,

1961). The subjects were aged 6 to 20 years and had hearing losses of greater than 65 dB HL in the speech frequencies for the better ear. For each test, the stimulus words were typed and presented on 3x5 cards. In addition, a comparison was made between oral presentation (the child was expected to speechread the word) and written presentation for forms A and B on the PPVT. That is, form A was adminstered in written form and form B was administered in oral form to the same individual. The author found correlations between performance on written presentation of each of the three tests of 0.84 to 0.90 across each of the variables. It was also found that scores on the PPVT following written presentation were significantly better than scores on the PPVT following oral presentation. The author concluded that each of these tests was suitable for use with the hearing-impaired population in the modified written form, but that scores obtained from presentation in written form should not be compared to the published norms in the manual which were obtained from oral presentation.

In an effort to develop norms for hearing-impaired children on the Peabody Picture Vocabulary Test, Forde (1977) tested all seventh grade hearing-impaired children in a school in Ontario over the period 1970-1975. Then, during the school year 1973-1974, he tested all children in grades 1 to 7 at that same school. From these students, he then selected scores from those students who met the following criteria: a hearing

loss in the speech range of 80 dB HL or greater for the better ear, a low frequency loss greater than 40 dB HL in the better ear, a high frequency loss greater that 40 dB HL in the better ear, an I.Q. performance of 80 or above, and an onset to hearing loss prior to learning language. One hundred and seventy three children met these criteria.

The test was then presented again, orally, as per the test manual. If the child indicated that he/she could not perceive the word due to auditory and/or visual (speechreading) difficulties, the test word was then presented in the written form. The examiner also continued the test past the suggested ceiling point of 6 out of 8 errors to 12 out of 16 errors. This extension of the test ceiling was performed in an effort to account for possible differences in difficulty of word order for hearing-impaired children.

An analysis of the scores demonstrated the plateau effect. The student's scores demonstrated a relatively large increase between certain years, and then maintained at the same level over subsequent years. For example, a relatively large increase was observed between the first and second year of school, followed by little or no increase between the second and third years of school. Scores then increased between the third and forth year. Finally, the scores did not increase between the forth and fifth year. The author speculated that this phenomenon occurred for either one of three reasons. Hearing-impaired children may take longer to

pass through stages of vocabulary acquisition; hearing-impaired children's vocabularies do not follow the incremented steps because the test was designed for hearing children; or the educational approach which emphasized speechreading with varying degrees of amplification resulted in slow uneven progress in vocabulary development.

Although this research provided important information, the PPVT was revised shortly after this study was completed and Forde's (1977) norms could not be applied to the PPVT-R. Bunch and Forde (1987) later reported scores on the PPVT-R for a group of 102 children aged 4 years, 7 months to 14 years, 6 months who met the same criteria described in the previous study. In this study, the test was presented using simultaneous oral and written directions and the test ceiling was again extended to 12 out of 16 errors on consecutive items. Their results showed the hearing-impaired children's scores were much lower than those reported in the PPVT-R for normal hearing children in the same age groups. They also observed the plateau effect in the scores of their sample population. Forde's (1977) previous explanation was reviewed in light of this phenomenon. The authors rejected Forde's hypothesis that the communication approach (speechreading with varying degrees of amplification) affected the children's scores, as the children in this second study were all trained using total communication or Visible English. However, children trained in total communication or visible english

communicate with the addition of a manual element (sign) to their language. Because the authors did not alter the presentation of the test to include a manual element, the children were not utilizing the communication approach for which they were trained. Therefore the rejection of this explanation was deemed unreasonable.

Crittenden, Ritterman and Wilcox (1986) investigated the child's communication mode and its relationship to performance on a receptive vocabulary test. The authors presented The Total Communication Receptive Vocabulary Test in five different communication modes: total communication with audio, total communication with the audio turned off (allowing for speechreading information), manual communication with no mouth movement, oral communication with audio, and oral communication without audio, to a group of 52 profoundly deaf students at a residential school.

They found that the presentation modes using manual communication (total communication with audio, total communication with audio turned off, and manual communication without mouth movement) resulted in performance significantly better than the performance obtained using either of the oral communication modes. This suggested that by testing vocabulary orally, the child's inability to perceive the stimulus word in this mode of presentation may have interfered with his/her performance on the test. When the test were presented with the addition of sign language, the children performed better. The

authors concluded that those children who are educated by means of total communication were between five and seven years more advanced in their ability to decode language presented manually over language presented aurally/orally.

Development of the Hypothesis

The results of the Crittenden et al. (1986) study suggested that hearing-impaired children's performance on receptive vocabulary testing improved with the use of a manual (sign) presentation of the test items. In light of these results, one would suspect that performance on the PPVT-R would also improve with the addition of a manual element. The addition of this element would eliminate the effects of the use of a potentially inappropriate communication mode on test performance. The course of vocabulary growth in hearing-impaired children could then be examined to determine if the plateau effect still occurred.

By administering a vocabulary test designed for hearing-impaired children (the TCRVT) and a test designed for normal hearing children (the PPVT-R) to the same group of hearing-impaired children in the preferred communication mode, performance could be compared. This would provide information on the ability of each test to measure vocabulary growth and identify vocabulary deficits for hearing-impaired children. This information would aide educators in the selection of the most appropriate receptive vocabulary assessment tool.

Hypothesis

It is hypothesized that if both the Total Communication Receptive Vocabulary Test and the Peabody Picture Vocabulary Test-Revised are administered in total communication to a group of hearing-impaired students, then both raw scores and age equivalent scores will be higher on the Total Communication Receptive Vocabulary Test because this test was designed specifically for hearing-impaired children. The age-equivalent scores on the TCRVT may also be better correlated with true chronological age than the PPVT-R age-equivalent scores.

CHAPTER II: METHODS

Subjects

A total of 10 children at the Montana School for the Deaf and Blind were selected for this study. Subjects were selected according to the following criteria:

1. Hearing loss of 80 dB HL or greater in the frequencies of 500, 1000 and 2000 Hz in the better ear (severe to profound loss).
2. School records indicating a performance I.Q. of 80 or better on the Weschler Intelligence Scale for Children-Revised.
3. Age range from 4 years 0 months to 13 years, 6 months.
5. Onset of hearing loss prior to the development of language.
6. Corrected vision to within normal limits.
7. No additional handicapping conditions.

Only those children who met these criteria exactly were used in this study in order to control for these variables. This theoretically allowed the results to be interpreted as differences between the actual tests rather than differences between the subjects. Demographic information for the subjects is presented in Table 1.

Test Administration

The Peabody Picture Vocabulary Test-Revised and the Total Communication Receptive Vocabulary Test were administered to each child on the same day. Prior to test administration, a "warm up" period of five minutes was conducted during which

TABLE 1

Subjects Demographic Information

Subject Number	Age*	Sex	Ear	Hearing Loss (dB HL) 500 Hz	1000 Hz	2000 Hz
1	5;6	F	R:	90	95	110
			L:	85	110	110
2	7;2	F	R:	90	100	110
			L:	90	105	110
3	9;0	F	R:	95	112	NR**
			L:	95	112	NR
4	11;2	F	R:	110	110	NR
			L:	110	112	NR
5	11;3	F	R:	NR	NR	NR
			L:	NR	NR	NR
6	12;9	M	R:	90	100	95
			L:	100	105	105
7	13:1	M	R:	85	95	100
			L:	85	100	110
8	13;2	F	R:	NR	NR	NR
			L:	95	105	105
9	13;2	F	R:	85	90	105
			L:	85	95	105
10	13;3	F	R:	90	95	110
			L:	100	110	110

*Ages are represented in years;months
**NR indicates no response at the limits of the audiometer

the examiner communicated with the child using total communication. This was completed in order to familiarize the child with the examiner. Signs were selected according to those most commonly used at the Montana School for the Deaf and Blind. The examiner presented all signs to a professional at the Montana School for the Deaf and Blind to ensure that they were signed appropriately. In addition, immediately following each test presentation, the examiner went back to all the items the child missed and had the child had the child present a sign expressively for the correct item. This was completed to determine if the sign presented during testing was the sign the child was familiar with for a given word.

The order of test presentation was counterbalanced so that half of the children took the PPVT-R (form L) first, and the other half took the TCRVT first. Testing was conducted in a quiet room with good lighting.

Both tests were administered according to the test administration instructions presented in each test manual with the exception that the PPVT-R is meant for oral presentation. The instructions and each test item was presented in total communication (simultaneous signing and speaking). In order to ensure the child understood the instructions, each child completed practice items for each test.

Data Analysis

Overall performance by the subjects on each of the two tests was compared using the Pearson r product moment

correlation procedure for both raw scores and age-equivalent scores. In addition, age-equivalent scores were compared to each child's chronological age. An item analysis for each test was completed to determine whether any patterns in errors occurred for this group of children.

CHAPTER III: RESULTS

The purpose of this study was to compare performance for hearing-impaired children on two measures of receptive vocabulary, The Peabody Picture Vocabulary Test-Revised and the Total Communication Receptive Vocabulary Test. This research attempted to answer the following questions:

1. What is the association between raw scores on these tests for this group of children?
2. What is the association between age-equivalent scores on these tests for this group of children?
3. What is the association between the age-equivalent scores for each test and the child's chronological age?
4. How did this group of children respond to individual test items.
5. How did each child's scores compare to the normative data for age-equivalent scores provided in each test manual.

Two speech-language pathologists calculated raw and age-equivalent scores for each test. Interjudge reliability was 100%. Both speech-language pathologists also determined the percentages of correct response for the item analyses. Interjudge reliability was again, 100%. Table 2 provides the subjects raw scores and age-equivalent scores on each of the tests.

Figure 1 illustrates the relationship between raw score performance on the PPVT-R and the TCRVT. The Pearson r product moment correlation coefficient for raw scores was 0.86.

TABLE 2

Subjects' Raw Scores and Age-Equivalent Scores

Subject Number	Age	PPVT-R Raw	PPVT-R Age-Equiv.	TCRVT Raw	TCRVT Age-Equiv.
1	5;6	41	3;11	52	5;3
2	7;2	59	5;2	68	9;3
3	9;0	78	6;9	73	12;3
4	11;2	80	6;11	74	12;9
5	11;3	82	7;1	75	13;0
6	12;9	100	9;0	73	12;3
7	13;1	81	7;0	73	12;3
8	13;2	77	6;7	75	13;0
9	13;2	83	7;2	75	13;0
10	13;3	84	7;3	73	12;3

*Age and age-equivalent scores are represented in years;months

FIGURE 1

Subjects' Raw Scores

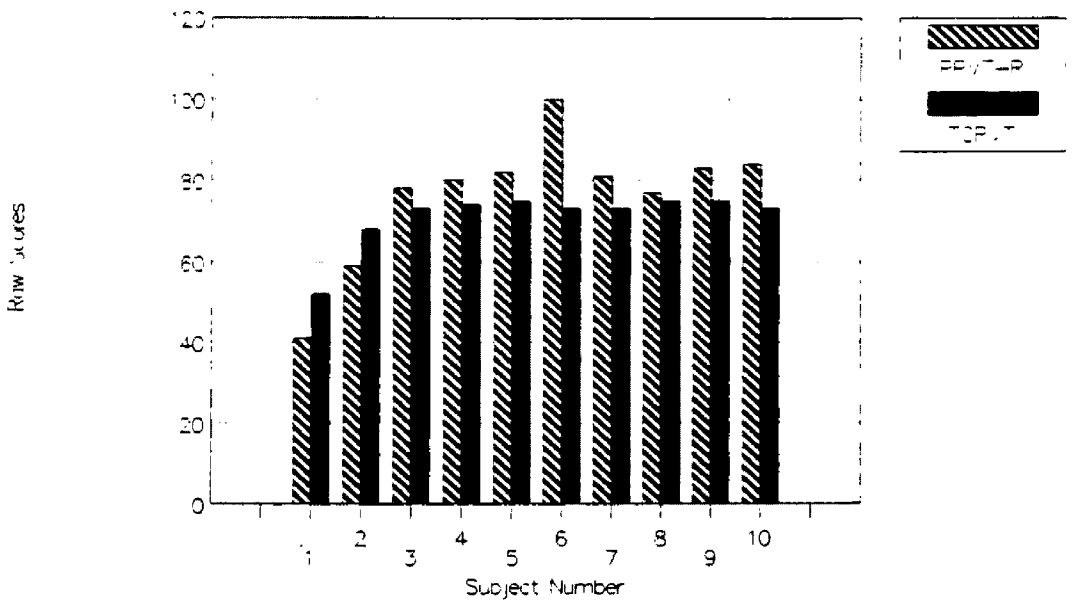


Figure 2 illustrates the relationship between age-equivalent scores on the two tests and the child's chronological age. The Pearson r correlation coefficient for age-equivalent scores on the PPVT-R and the TCRVT was 0.86. The correlation coefficient for the age-equivalent scores on the PPVT-R and chronological ages was 0.82. The correlation coefficient for age-equivalent scores on the TCRVT and chronological ages was 0.86.

An item analysis for items completed correctly on the Peabody Picture Vocabulary Test-Revised is presented in Table 3. On this test, each child began testing at a level where he/she obtained 8 consecutive correct responses. Therefore, not all items were completed by all children. Only those items which were completed by at least 7 of the 10 subjects were included in the item analysis. For a complete list of items and foils, see Appendix A.

An item analysis for the Total Communication Receptive Vocabulary Test is presented in Table 4. All items were completed by at least 7 of the ten subject. For a complete list of items and foils, see Appendix B.

FIGURE 2

Subjects' Age-Equivalent Scores

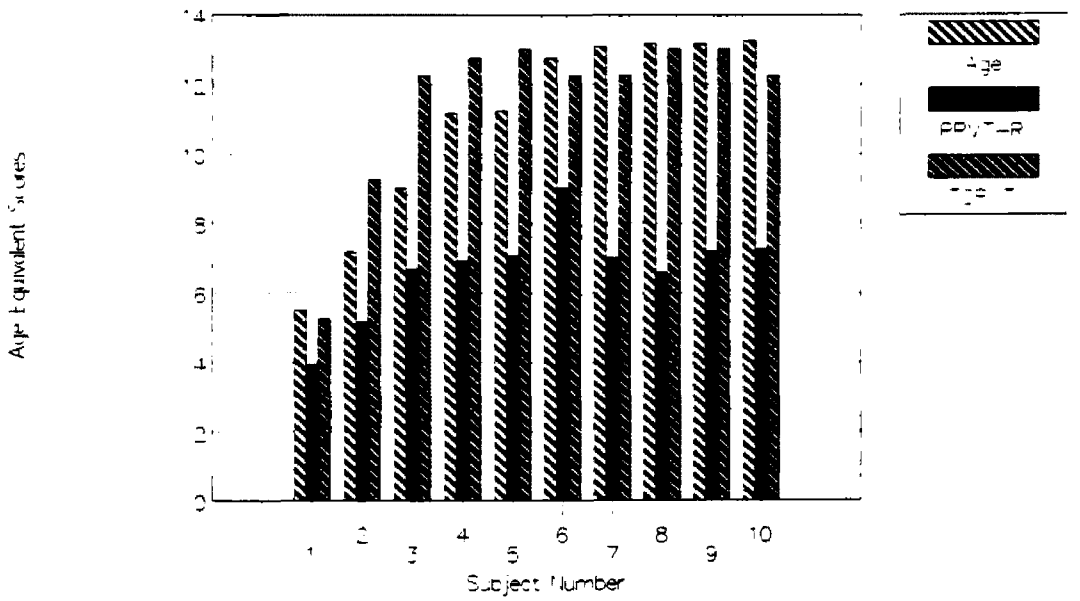


TABLE 3

Item Analysis for Peabody Picture Vocabulary Test-Revised

Percentage of Correct Response

100%	90%	80%	70%	60%	50%	>50%
Claw	Tambourine	Furry	Dripping	Pedal	Casserole	Reptile
Faucet		Vegetable	Forest	Trunk	Amazed	Spatula
Awarding		Clamp	Capsule	Inflated	Isolation	Vine
Reel		Decorated	Pitcher			Weasel
Signal		Frame	Disagreement			Demolishing
Filing		Group	Exhausted			Balcony
Scalp		Stem	Ceremony			Bolt
Twig		Vase	Island			Carpenter
Tusk		Surprised				Coast
Communica-tion		Bark				Locket
		Mechanic				Vehicle
Shoulder		Nostril				Fragile
		Globe				Human
		Cooperation				Adjustable
		Tubular				
		Disappoint-ment				

TABLE 4

Item Analysis for Total Communication Receptive Vocabulary Test

Percentage of Correct Response

100%	90%	80%	70%	60%
				Myself
Baby	Man	Hot		
Airplane	Behind	Snow		
Telephone	Buy	Night		
Boat	Taller	Work		
Cat	Electricity	Restaurant		
Train	Together	Practice		
Apple	Vacation	Help		
Butterfly	Bashful	Minister		
Mother	Follow			
Girl	Study			
Conversation	Another			
Jump				
Tree				
Indian				
Money				
Read				
Cry				
Under				
Meat				
Ice				
Swim				
Children				
Paint				
Grandmother				
Picture				
Run				
Kiss				
Dress				
School				
Surprise				
Shop				
Teacher				
Friend				
Present				
Hurt				
Church				
Old				
In				
Candy				
Winter				
Smell				
Dance				
Movie				
Family				
Disappointed				
Empty				
Famous				
Group				
Shoes				
Make				
Same				

CHAPTER FOUR: DISCUSSION

The purpose of this study was to compare the performance of hearing-impaired children on two measures of receptive vocabulary, the Peabody Picture Vocabulary Test-Revised (PPVT-R) and the Total Communication Receptive Vocabulary Test (TCRVT). Ten hearing-impaired children from the Montana School for Deaf and Blind were given each of the two tests. Each child met the following criteria: a severe to profound hearing loss, a performance I.Q. of 80 or better, normal or corrected vision and no additional handicapping conditions. The results of this study supported the hypothesis that for this group, performance was better on the TCRVT. The results of this study also provided information about the relationship between scores on the two tests. However, several factors must be considered when interpreting these results.

The Pearson r correlation coefficient was used to compare raw scores on each test, age-equivalent scores on each test, and age-equivalent scores on each test as compared to chronological age. The correlation coefficient for each comparison was very high. These data suggest a strong positive relationship between both raw and age-equivalent scores on the two tests. If a child received a low score on the PPVT-R, he/she would likely receive a low score on the TCRVT. Likewise if a child received a high score on the PPVT-R, he/she would likely receive a high score on the TCRVT.

One problem with this interpretation is that while all the children were able to obtain basal and ceiling scores according the administration procedures for the PPVT-R, only one out of the ten children reached a ceiling on the TCRVT. That is, only one child made five consecutive errors on the TCRVT before completion of the test. This test only contains seventy-five items, and nine of the ten children completed all 75 items before reaching ceiling. This ceiling effect prevented raw scores from exceeding 75 and age-equivalent scores from exceeding 13 years, 0 months. The TCRVT may not have adequately estimated vocabulary due to the ceiling effect. Scores on the TCRVT might have been higher if more advanced items were provided on the test. Higher scores on the TCRVT would then change the correlation between both raw scores and age-equivalent scores on the two tests obtained during this study. Initially as scores on the TCRVT increased, the correlation between the raw scores on the tests would become more positive. Increased raw scores on the TCRVT would increase age-equivalent scores and most likely decrease their correlation as the TCRVT age-equivalent scores would further exceed the PPVT-R age-equivalent scores.

The interpretation of these results may also be limited due to the relatively small sample size. Hearing-impaired children are a heterogenous group. Factors such as degree of hearing loss, type and frequency of amplification, age of onset, type of communication method, and family involvement

may influence a child's performance on a measure of receptive vocabulary. In order to control for these variables the current study applied strict criteria in subject selection. Of the twenty-five children who met the criteria for this study, only ten were given permission to participate. The results obtained from this sample demonstrated a strong positive relationship between scores on the two tests. The small sample size limits the degree to which these results may be generalized as being representative of the entire group of children who would meet the criteria of the study. Neither can these results be interpreted as being representative of the entire group of hearing-impaired children because of the variables described above. The results of this study do suggest a trend that hearing-impaired children's performance on the TCRVT will be superior to their performance on the PPVT-R.

Several issues discussed earlier in this text are also relevant in the interpretation of the results. These include the difference in vocabulary norms for hearing-impaired versus normal hearing children, the mode of communication for test administration and the iconicity of some signs.

Vocabulary Norms

Silverman-Dresner and Guilfoyle (1972) provided vocabulary norms for hearing-impaired children by age level. Table 5 presents an item analysis by age of aquisition based on these norms. Sixty-nine percent of the items on the Total

TABLE 5

Item Analysis by Acquisition Age

Peabody Picture Vocabulary Test-Revised

AGE	10 - 11 yrs	12 - 13 yrs	14 - 15 yrs	16 - 17 yrs
		Vegetable	Awarding	Furry
		Forest	Signal	Shoulder
			Group	Surprised
			Disappointment	Cooperation
			Globe	Ceremony
			Dripping	Carpenter
			Amazed	Coast

Total Communication Receptive Vocabulary Test

AGE	10 -11 yrs	12 - 13 yrs	14 - 15 yrs	16 - 17 yrs
	Boat	Baby	Butterfly	Cry
	Shoes	Train	Mother	Run
	Apple	Girl	Jump	Surprise
	Cat	Tree	Money	Smell
	Swim	Meat	Read	Disappointed
	Children	Old	Under	Make
	Picture	In	Kiss	Famous
	Teacher	Candy	Shop	Behind
	Hot	Winter	Friend	Vacation
		Dance	Group	Another
		Movie	Man	Restaurant
		Family	Boy	Help
		Taller		
		Snow		
		Night		

Communication Receptive Vocabulary Test appeared in these norms. Of the 52 items which were present in these norms, 19% were words acquired by children aged 10-11, 29% were words acquired by children at 12-13 years, 25% were word acquired by children at 14-15 years and 27% were words acquired by children of 16-17 years. On the Peabody Picture Vocabulary Test-Revised, only 31% of the items analyzed in the item analysis were present in the Silverman-Dresner and Guilfoyle. Of these items, 12% were words usually acquired by children of 12-13 years, 41% were items acquired by children of 14-15 years, and 47% of the items were acquired by children of 16-17 years.

The majority of items from the TCRVT are words that appear in the Silverman-Dresner and Guilfoyle norms. The majority of items from the PPVT-R do not. The TCRVT also reports that in the development of the test, stimulus words were selected from beginning readers used by hearing-impaired students. In interpreting the results of this study, it must be noted that performance on the TCRVT reflects each child's performance in comparison to vocabulary norms for hearing-impaired children. Performance on the PPVT-R represents performance in comparison to vocabulary norms for normal hearing individuals. This may account for higher age-equivalent scores on the Total Communication Receptive Vocabulary Test.

The difference in performance on these two tests as

identified by this study, should be considered by speech-language pathologists when they assess a hearing-impaired child's receptive vocabulary skills. Although a hearing-impaired child may score high on a test comparing him/her to other hearing-impaired children, such as the TCRVT, the score cannot be interpreted as high performance in comparison to normative vocabulary data established for normal hearing children. The high correlation on these two tests suggests an estimate of performance on the PPVT-R could be obtained when using the TCRVT, but an accurate assessment of the child's vocabulary in comparison to hearing children could not be obtained in this manner.

Mode of Communication

Studies by Hedger (1965) and Crittenden et al. (1986) suggested that the mode of communication influenced performance on measures of receptive vocabulary. Hedger (1965) found written performance superior to oral performance on measures of receptive vocabulary for hearing-impaired subjects. Crittenden et al. found the addition of a manual element (sign) improved performance on the TCRVT for hearing impaired children. Both authors suggested that the presentation of a receptive vocabulary test in the appropriate mode of communication prevented hearing-impaired children from being penalized for not correctly perceiving the test items.

In the current study, both tests were administered in total communication (simultaneous signing and speaking). This

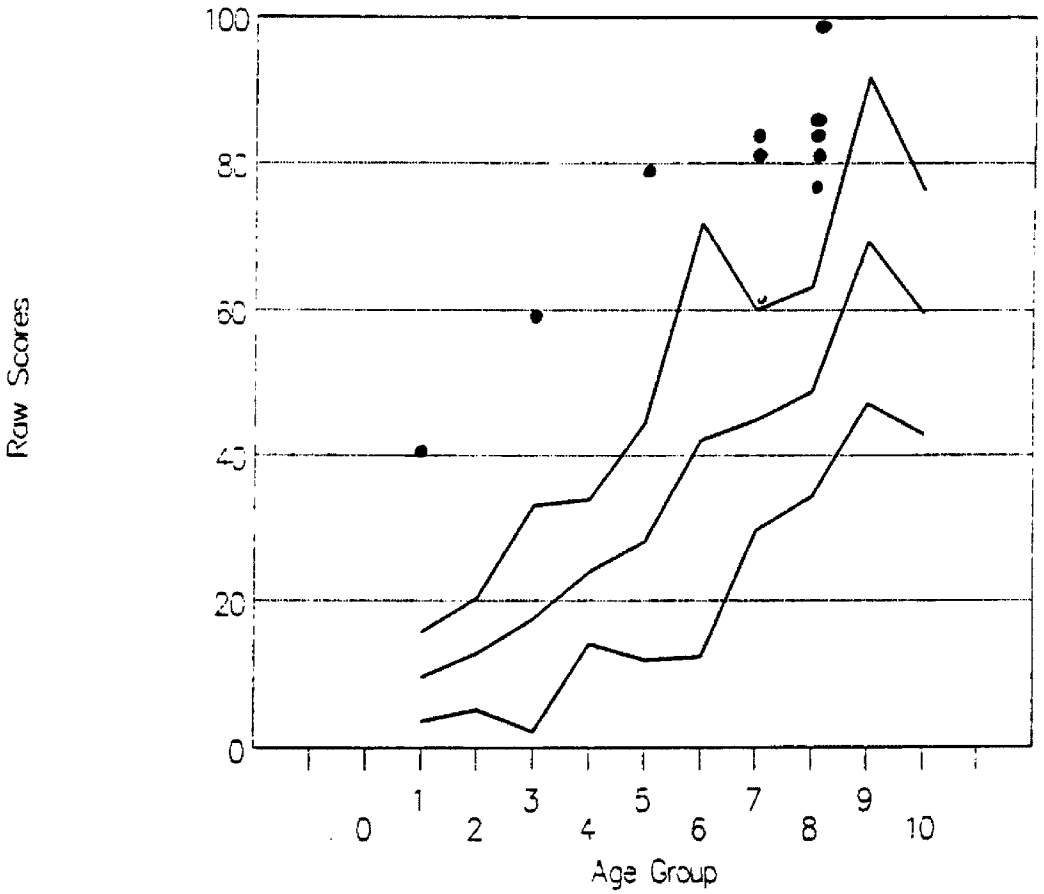
was the preferred mode of communication for the children participating in this study. Therefore, the children were probably not penalized for not perceiving test items correctly.

The research by Bunch and Forde (1987) provided some normative data for hearing-impaired children on the Peabody Picture Vocabulary Test-Revised. Figure 3 illustrates the relationship between scores for the children in this study in relation to scores for children in the Bunch and Forde study. All children in this study scored higher than one standard deviation above the mean for the children in the Bunch & Forde study. One explanation for this finding is that the use of total communication, rather than oral or written presentation, improved children's scores. These results would support the research by Crittenden et al. (1986) suggesting that a hearing-impaired child's ability to decode language manually is far more advanced than the child's ability to decode language orally.

The children in the current study performed better than the children in the Bunch and Forde study even without the extended ceiling. In the Bunch and Forde study, testing was discontinued when the child made 12 out of 16 consecutive errors on test items. In this study, testing was discontinued as per the test manual, when the child made 6 out of 8 consecutive errors. The extension of the ceiling would allow more items to be administered and potentially raise scores on

FIGURE 3

Subjects' Scores Compared to Bunch & Forde Age Groups



the test. Had the ceiling been extended in the current study, performance may have further exceeded performance in the Bunch and Forde study.

The mode of communication must also be considered when comparing subjects' raw scores to the normative data provided in the test manual, and when determining age-equivalent scores. The TCRVT was standardized for presentation in total communication. The PPVT-R was standardized for oral presentation. As a result, comparison of the TCRVT scores obtained in this study to the normative data provided in its test manual can be considered valid given the sample size. In contrast, the comparison of PPVT-R scores in this study to normative data in the test manual can not be considered valid due to the change in the mode of communication which does not comply with the standardization procedures for the PPVT-R.

Test administration in total communication may have controlled for inappropriate communication mode but the iconicity of some signs may have influenced selection of the appropriate word. In the item analysis, several items were identified as having potential iconic influence.

Sign Iconicity

The iconicity of a sign refers to the signs resemblance to the word. For example, the sign for "baby" is cradling the arms together as if holding a baby. One criteria for selection of test items for the Total Communication Receptive Vocabulary Test was each word's ability to be represented in

sign. Although this is a necessary consideration for development of test items for hearing-impaired children, there was no control for the iconicity of the signs. This examiner judged that approximately 40% of the signs on the TCRVT to be iconic. The iconicity of these signs could have allowed the child to select the correct response without actually knowing the vocabulary word.

In the development of the PPVT-R, the ease in which items could be represented in sign was not considered. When the test was adapted for administration in total communication for this study, signs were selected according to those used at the Montana School for the Deaf and Blind. Several signs were considered direct representations of the words, such as elbow, scalp and shoulder. Other signs were iconic and resembled the correct picture such as boat (two hands cupped together) and tying (two hands mime tying a shoe). Still other test items had no sign equivalent and had to fingerspelled. When this test was administered in sign, there was no control for these variables. Again,the iconicity of the test items could allow the child to select the appropriate item without actually knowing the vocabulary word.

The iconicity of some signs on both of the tests can not be ruled out as influencing the performance of the subjects in this study. It is also likely that the more easily a word can be represented in sign, the more likely the child will know it. Administering a test via a written method or by

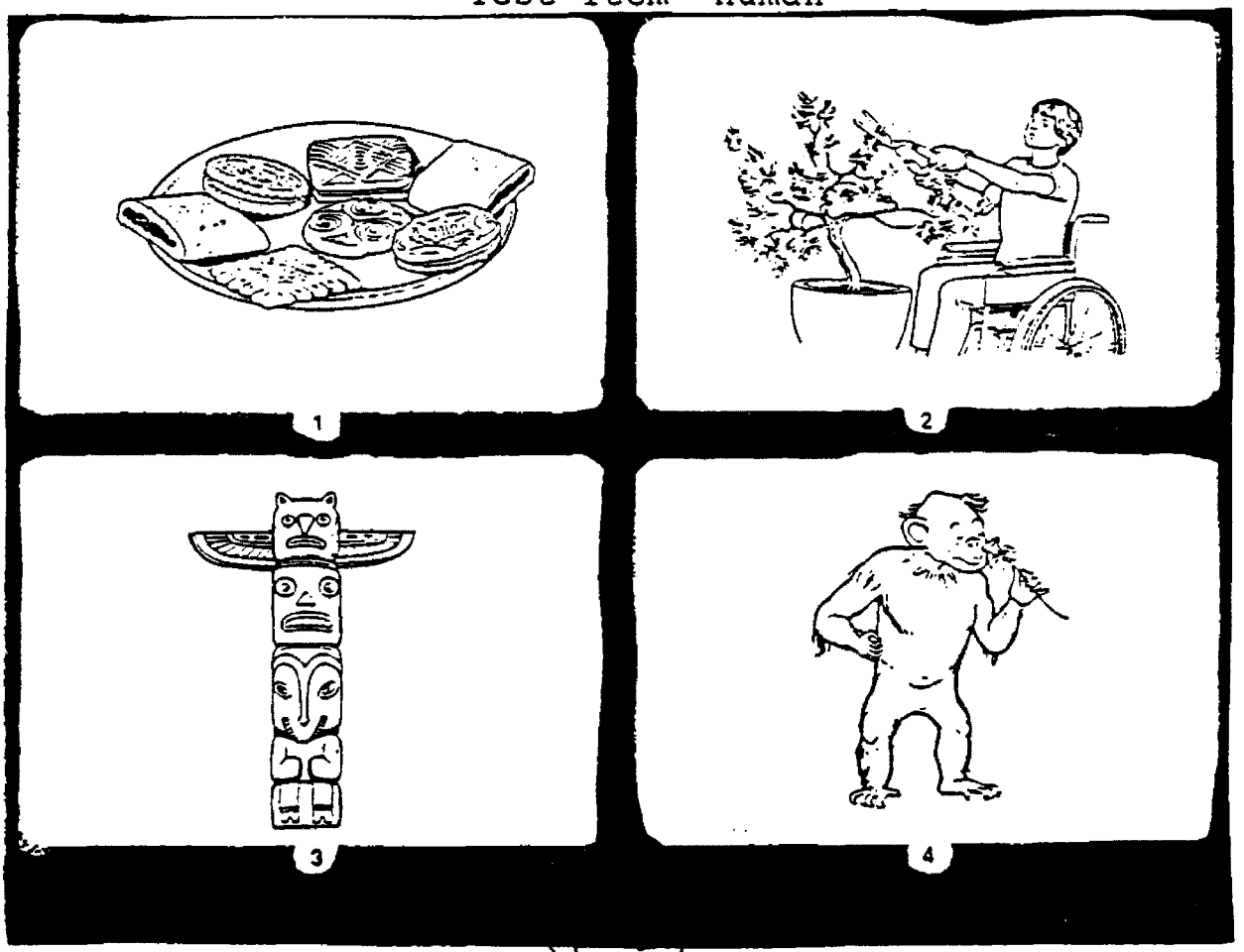
fingerspelling (one handshape representing each letter) would prevent the influence of sign iconicity.

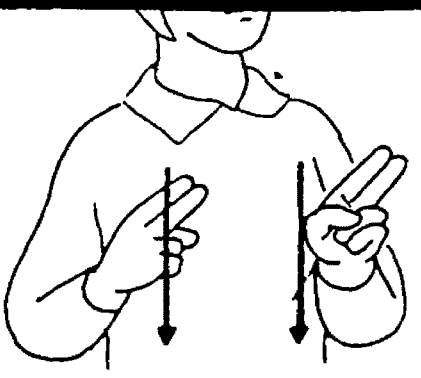
One particularly interesting observation of this study was the tendency of some of the signs to mislead the children to select the wrong picture. Figure 4 represents the sign for human and the four picture plates representing this word on the PPVT-R. The majority of the children (67%) selected the totem pole in response to this sign. In this case the iconicity of the sign led the children to the wrong picture. Similarly, Figure 5 illustrates the sign for carpenter and test pictures for this word on the PPVT-R. Again, the iconicity of the sign led 75% of the children to select the bricklayer as the sign resembles smoothing mortar. Following the testing, when the child was asked to express a sign for the correct picture, most children signed carpenter, which suggested either man could have represented the carpenter. Two other children expressed the sign hammering for the correct item. For these two children, the carpenter picture did not represent a carpenter, but they were able to give an appropriate vocabulary word for the picture.

In summary, while iconic influence can not be ruled out, it cannot be assumed that this influence will always improve performance.

FIGURE 4

Sign Iconicity Example A:
Test Item "Human"

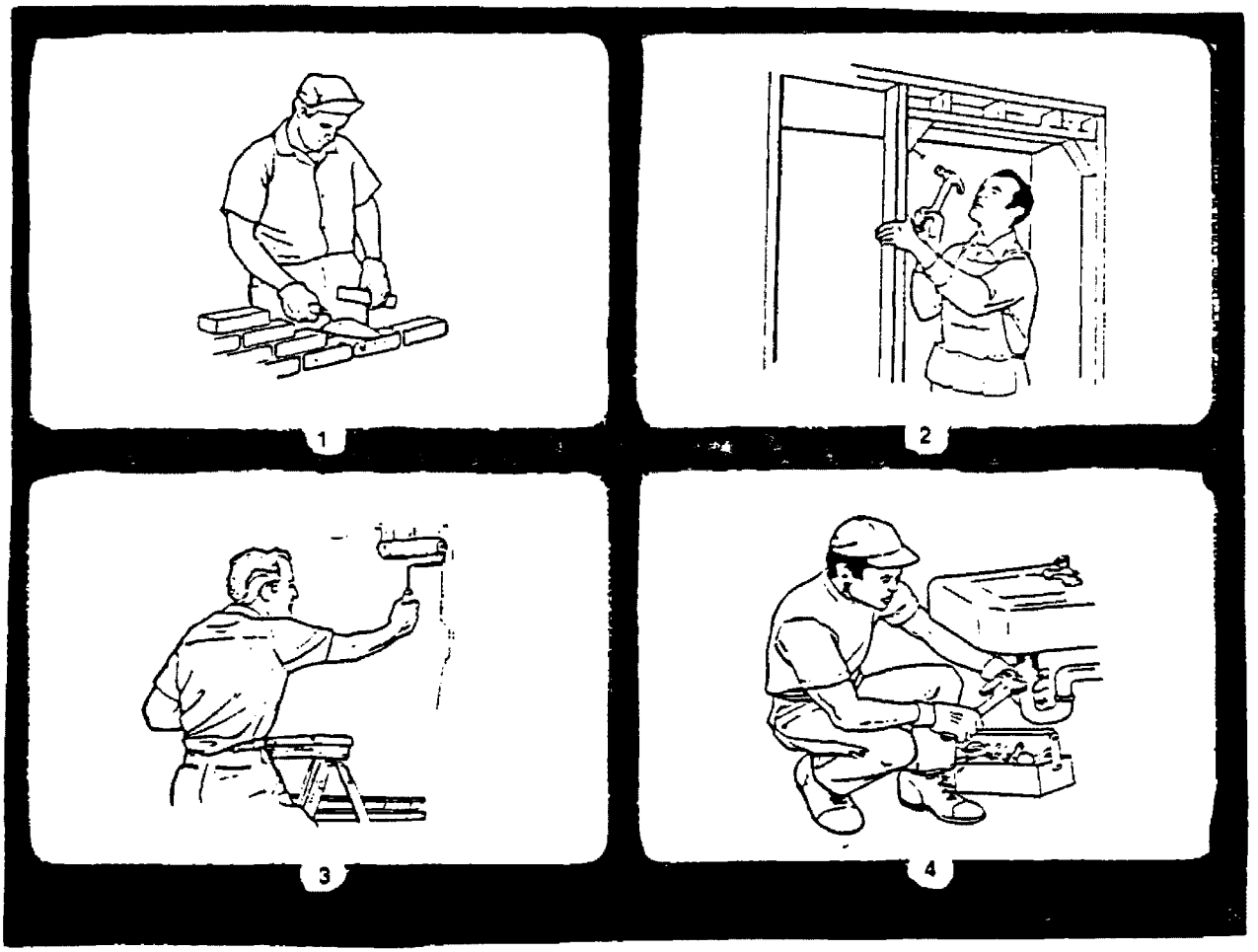


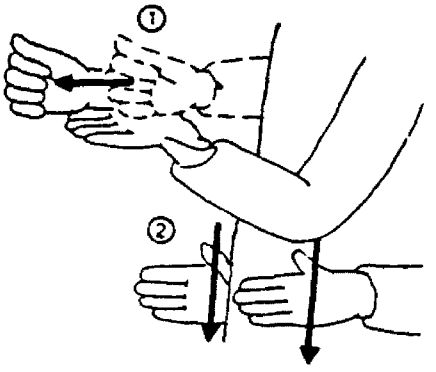


human
H shape both hands, tips out.
Place wrists at sides of chest and
move down.

FIGURE 5

Sign Iconicity, Example B:
Test Item "Carpenter"





carpenter

LH open B palm up, tips out. A shape RH. Place A on base of left palm and push forward as if planing a piece of wood. Follow with agent marker.

Implications for future research.

Further research to investigate performance of hearing-impaired children on measures of receptive vocabulary could be enhanced by the following: a larger sample size of children, further investigation of the effects of the mode of communication and further investigation of the effects of sign iconicity.

A larger sample size of children who fit the criteria for this study would provide better normative data to aid educators in the identification of vocabulary deficits. The group of children in this study ranged in age from 5 years to 13 years. This limited age range, along with the small sample size did not allow for comparison of the two tests for a particular age-group. A larger sample size would allow for investigation of the correlation of these two tests for specific age groups. In addition, the use of TCRVT with younger children, in which the ceiling effect would not influence scores would also be of interest. For a younger age group, the TCRVT might better discriminate between children with vocabulary deficits.

Further study could also investigate the mode of communication and its influence on performance on the PPVT-R. This test is available in two forms, (L & M) and several studies have reported a high correlation between the performance on these two forms (Bracken, et al., 1984). The test could be administered to the same group of children,

either hearing or hearing-impaired, using one mode of communication for one form and another mode of communication for the other form. Scores could then be correlated to determine the influence of mode of communication.

In order to investigate vocabulary performance by normal hearing individuals, without the influence of communication mode, the tests could both be presented orally. The performance could be compared to normative data in each test manual to determine if normal hearing children performed better on one test over the other. The correlation of the two tests for normal hearing children could also be determined.

Finally, the influence of iconicity could be investigated. This could be accomplished in several ways. Either test could be split into subtests of signs with varying degrees of iconicity. These subtests could be administered to the same group of children to determine if performance varied across subtests. Another way to investigate the influence of iconicity would be to administer both tests in sign to normal hearing individuals who have no knowledge of sign language. Scores on the tests would then represent items which could be selected solely on the basis of sign iconicity.

Conclusions

The results of this study suggest a strong positive relationship between scores on the Peabody Picture Vocabulary Test-Revised, a test designed for normal hearing individuals, and the Total Communication Receptive Vocabulary Test, a test designed for hearing-impaired children. These results should be interpreted in light of several factors. These included the small sample size for this study, the age of children in this study, the iconicity of signs and its influence on selection of the correct item, and the communication mode in which these two tests were presented.

The results of this study also showed that while the children in this study compared favorably to normative data for hearing-impaired children, they scored significantly below the mean (two standard deviations) in comparison to normal hearing individuals. The scores on the Peabody Picture Vocabulary Test-Revised can not be interpreted as demonstrating these children's full vocabulary potential for several reasons. First of all, there is not a one to one relationship between words in English and signs in any sign system or language. This prevents the evaluation of single word vocabulary from being a valid representation of each child's communication potential. For example, in oral English several different words may express the same idea, such as, tired, exhausted, and worn-out. In sign, these same ideas can be expressed with different inflection of the same sign rather

than with different signs. A child who understands the concept of differing degrees of being tired would be penalized on a test such as the PPVT-R for not correctly identifying the different words, which in turn would not be representative of the child's conceptual vocabulary.

One method to bypass this problem would be to evaluate vocabulary in context to determine whether or not the child has the understanding of different concepts, which in oral English are expressed as different words.

Another issue to consider in the measurement of vocabulary for hearing-impaired children is the difference between functional, everyday vocabulary and reading vocabulary. In functional vocabulary, it is not necessarily important to know a variety of words that mean the same thing. A child can convey meaning with a single word. For example, if a building has been torn down, the child could use either the word destroyed of demolished to express this idea. Knowing that these two words are synonyms does not improve functional communication of the message. If the child can use either one of the words, he/she will get his/her meaning across. However, in reading, the child may need to know these words are synonymous. Therefore, a rich vocabulary will aid in the comprehension of reading material.

In conclusion, educators and other professionals working with hearing-impaired children need to consider vocabulary expectations for both everyday communication and for reading.

By providing the hearing-impaired child with a wealth of vocabulary, he/she will function best at tasks of both reading comprehension and oral/signed expression. In addition, tests which measure vocabulary for hearing-impaired individuals must consider the communication mode of test presentation, the iconicity of the signs, and the characteristics of the population being tested. Anything less and the test may be an invalid measure of the hearing-impaired child's true vocabulary repertoire.

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APPENDIX A

Peabody Picture Vocabulary Test-Revised
Test Items (underlined) and Foils

Training Plates

1	fork	table	car	doll
2	mouth	man	comb	sock
3	walking	climbing	swinging	drinking

Test	Items				Percent Correct	N
1	brush	bell	horse	bus	100	1
2	hand	duck	ball	shoe	100	1
3	bench	desk	bed	stool	100	1
4	microscope	tractor	binoculars	bike	100	1
5	closet	dormer	vent	counter	100	1
6	seal	seahorse	bee	snake	100	1
7	flashlight	boat	basket	balloon	100	1
8	gate	axe	tire	spool	100	1
9	cow	pig	lamb	kangaroo	100	1
10	wagon	hoe	mop	lamp	100	1
11	plow	pinball	drum	bear	100	1
12	toe	chin	ear	knee	100	1
13	tram	helicopter	glider	blimp	100	1
14	heel	neck	wrist	elbow	100	1
15	necklace	bracelet	earring	bandage	100	1
16	feather	tail fin	antler	claw	100	1
17	full toothpicks	full groceries	empty	full glass	0	1

Test	Items				Percent Correct	N
18	roof	pillars	arch	fence	100	1
19	fence	accident	woodpile	chick	100	1
20	hydrant	net	safe	thermostat	100	2
21	lasso	trick	steal	tearing	100	2
22	sail	windmill	weather vane	flag	100	2
23	fixing	measuring	helping	loading	0	2
24	decorating	mixing	peeling	polishing	100	2
25	cage	bird house	bee hive	dog house	100	2
26	colander	bolt	board	tool	100	2
27	rectangle	triangle	star	square	0	2
28	stretching	rolling	lifting	jumping	0	2
29	whip	arrow	paddle	yo-yo	100	2
30	pulling	tying	climbing	pulling	100	3
31	nest	caged bird	tower	gondola	100	3
32	trunk	envelope	saw	magazine	100	3
33	reel	propeller	hook	pincer	100	3
34	dusting	oiling	erasing	pasting	100	4
35	patting	pouring	waving	climbing	100	5
36	penguin	ostrich	hippo	kangaroo	100	5
37	sweeping	sewing	wrapping	baking	80	5
38	delivering	entering	swinging	reading	100	5
39	swimming	diving	jumping	floating	80	5
40	airplane	rocket	parachute	helicopter	100	8
41	parrot	porpoise	frog	furry	88	8
42	nut	cactus	salami	vegetable	88	8
43	thumb	scalp	shoulder	knee	100	8

Test	Items				Percent Correct	N
44	shower	dripping	fountain	pouring	78	9
45	antler	hooves	beak	claw	100	9
46	thermos	coffee pot	decorated	pan	89	9
47	frame	rolling pin	dust pan	clothes pin	89	9
48	valley	crops	forest	waterfall	79	9
49	pipe	faucet	flashlight	toothbrush	100	9
50	one person	two people	group	one person	89	9
51	gourd	acorn	stem	lettuce	89	9
52	thermos	jar	vase	glass	89	9
53	pedal	drill bit	saddle	flat tire	67	9
54	camera	capsule	goggles	binoculars	78	9
55	assured	humiliated	angry	surprised	89	9
56	flowers	bark	fern	lettuce	89	9
57	driver	mechanic	attendant	chauffeur	80	10
58	tambourine	drum	maracas	cymbals	80	10
59	catching	kissing	noticing	disappointment	88	9
60	guarding	hitting	awarding	kicking	100	9
61	thermos	hammock	pitcher	scoop	78	9
62	reel	scale	thermos	microphone	100	9
63	signal	hydrant	compass	thermostat	100	9
64	gourd	trunk	grapes	celery	67	9
65	cookies	human	totem pole	monkey	0	9
66	nostril	lips	forehead	eye	89	9
67	disagreement	sipping	cutting	shaking	78	9
68	meditating	exhausted	playing	sitting	78	9

Test	Items				Percent Correct	N
69	palm tree	fern	wheat	vine	22	9
70	massage	serve	flat tire	ceremony	78	9
71	ice bucket	casserole	barbecue	rack	56	9
72	lawn mower	ferris wheel	carousel	vehicle	11	9
73	earphones	compass	globe	blimp	89	9
74	opening	plugging in	filing	oiling	100	9
75	grounder	clamp	coaster	beaker	89	9
76	seahorse	reptile	crayfish	fish	33	9
77	island	bay	lake	dam	78	9
78	scoop	pincers	spatula	fork	38	8
79	playing	entering	separate	cooperation	88	8
80	hair	elbow	beard	scalp	100	8
81	fern	twig	pine cone	wheat	100	8
82	platypus	weasel	penguin	racoon	25	8
83	working	writing	hammering	demolishing	25	8
84	balcony	fountain	arcade	doorway	29	7
85	locket	earring	necklace	bracelet	13	8
86	jailed	ghost	amazed	angry	50	8
87	tubular	box	polygon	polygon	88	8
88	tusk	rhinoceros	antler	unicorn	100	8
89	staple	screw	bolt	file	25	8
90	looking	delivering	examining	communication	100	8
91	bricklayer	carpenter	painter	plumber	25	8
92	isolation	picnic	dog trick	checkers	50	8
93	drum	umbrella	inflated	kite	63	8
94	desert	quarry	coast	cliff	25	8

Test	Items				Percent Correct	N
95	badge	adjustable	glove	handkerchief	0	8
96	goggles	whip	fragile	feather	29	7
97	assaulting	dancing	crossing	toe touch	40	5
98	appliance	canteen	cornucopia	valve	40	5
99	cone	triangle	polygon	pyramid	40	5
100	blazing	melting	smoking	tornado	0	3
101	hoisting	finishing	catching	lifting	100	2
102	vent	pagoda	dormer	arch	100	1
103	delivering	transaction	working	lecturing	100	1
104	wall	A-frame	roof	dilapidated	100	1
105	writing	contemplating	showing	eskimo	100	1
106	canister	thermos	vase	jar	100	1
107	catching	washing	dissecting	counting	0	1
108	bells	track	xylophone	link	100	1
109	crying	frightened	solemn	pleased	0	1
110	jousting	archery	juggling	lassoing	100	1
111	brew	caged	transparent	shelves	0	1
112	husk	pine cone	gourd	pods	0	1
113	lawn mower	utensil	microphone	lantern	0	1
114	gourd	pineapple	citrus	celery	100	1
115	reporter	pedestrian	fan	knight	100	1
116	parallelogram	shape	half-circle	target	100	1
117	pulling	waking	slumbering	making bed	100	1
118	bay	island	inlet	peninsula	100	1
119	statue	upholstery	candelabra	drape	0	1
120	towing	bridge	garage	barricade	0	1

Test	Items				Percent Correct	N
121	sextet	trio	5 singers	quartet	0	1
122	dragon	drinking	tranquil	badger	0	1
123	abrasive	board	rolling pin	skewer	0	1
124	watering	amazed	fatigued	sitting	0	1

APPENDIX B

Total Communication Receptive Vocabulary Test
Test Items (underlined) and Foils

Training Plates

1	jump	indian	bird	children
2	airplane	people	paint	dog
3	snow	people	frog	ball

Test	Items				Percent Correct	N
1	baby	butterfly	grandma	apple	100	10
2	airplane	children	meat	cat	100	10
3	bird	swimming	telephone	man	100	10
4	boat	famous	full	shop	100	10
5	butterfly	same	apple	shoes	100	10
6	train	movie	dog	bird	100	10
7	money	glass	apple	indian	100	10
8	butterfly	elephant	bird	frog	100	10
9	help	smell	kiss	mother	90	10
10	dance	girl	skate	tennis	100	10
11	cat	butterfly	same	swim	100	10
12	make	boy	jump	myself	100	10
13	church	bird	car	tree	100	10
14	ball	old	indian	shoes	100	10
15	meat	money	church	old	100	10
16	jump	indian	work	hot	80	10
17	hearing aid	tree	old	hot	100	10

Test	Items				Percent Correct	N
18	read	boy	dance	bowling	100	10
19	bowling	minister	cry	conversation	100	10
20	man	famous	under	wine	100	10
21	meat	under	wine	apple	100	10
22	train	candy	dress	ice	100	10
23	meat	skate	girl	swim	100	10
24	airplane	minister	children	bowling	100	10
25	snow	indian	school	full	80	10
26	help	paint	skate	trike	100	10
27	grandma	hot	on	vacation	100	10
28	dog	bird	night	teacher	80	10
29	hearing aid	man	picture	climb	100	10
30	cry	converse	man	swing	90	10
31	paint	run	friend	swing	100	10
32	shop	kiss	cry	night	100	10
33	penguin	dress	bird	family	100	10
34	school	study	airplane	deer	100	10
35	boots	cats	surprise	dance	100	10
36	study	shop	drink	picture	100	10
37	paint	drink	shop	teacher	100	10
38	friend	restaurant	picture	tired	100	10
39	another	vacation	present	read	100	10
40	hurt	read	grandma	run	100	10
41	deer	smell	hearing aid	children	100	10
42	hearing aid	penguin	old	cry	100	10

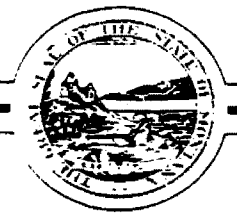
Test	Items				Percent Correct	N
43	car	in	tree	girl	100	10
44	minister	candy	snow	fixing	100	10
45	school	tires	behind	read	90	10
46	conversation	buy	fish	electricity	90	10
47	winter	kiss	work	elephant	100	10
48	restaurant	taller	phone	shop	90	10
49	drink	operator	smell	grandma	100	10
50	read	bowl	tennis	dance	100	10
51	make	movie	electricity	friend	100	10
52	on	cat	hippo	man	80	10
53	same	present	movie	drink	100	10
54	ski	operator	family	school	100	10
55	indian	surprised	teacher	electricity	90	10
56	hurt	man	together	boat	90	10
57	same	drink	swim	hippo	100	10
58	vacation	deer	girl	myself	90	10
59	picture	together	boots	bashful	90	10
60	church	myself	tree	work	60	10
61	disappointed	vacation	behind	run	100	10
62	conversation	jump	work	children	80	10
63	restaurant	disappointed	surprise	group	80	10
64	boy	make	electricity	ski	100	9
65	practice	bird	empty	operator	80	9
66	follow	tennis	boy	help	80	9
67	man	glass	group	indian	100	9

Test	Items				Percent Correct	N
68	empty	smell	ski	full	100	9
69	follow	practice	indian	swing	90	9
70	myself	movie	make	study	90	9
71	another	broken	hot	teacher	90	9
72	man	minister	famous	deer	80	9
73	ice	full	man	trike	100	9
74	study	climb	taller	conversation	100	8
75	swing	fish	drink	famous	100	8

APPENDIX C

Letter Requesting Participation in the Study

SCHOOL FOR THE DEAF AND THE BLIND



STATE OF MONTANA

3911 CENTRAL AVENUE GREAT FALLS MONTANA 59401 406 453 1401

TED SCHWINDEN GOVERNOR

June 16, 1988

Dear Parents:

Please find enclosed a letter of information from Rachel Glazer, who is a master's degree student at the University of Montana in Missoula. The letter describes a study that she will be conducting on the M.S.D.B. campus this fall. The study is being done with the approval of M.S.D.B., and we would encourage you to allow your child to participate. The results of the testing will be available to you and can also be placed in your child's file, to help in the development of an appropriate set of goals in the area of vocabulary.

Along with the letter of information, you will also find enclosed herein a two-sided Basic Consent Form and Information Summary for Parents/Guardians. Please sign the forms as requested and return them to Ms. Glazer in the envelope that has been provided for your convenience.

All testing will be done on the M.S.D.B. campus in the academic building, and your child will be in a supervised situation. Every attempt will be made to conduct the testing during your child's study hall, or during a time when they are not involved directly in class work.

If you have any questions or concerns regarding this study, please feel free to contact us here during the summer.

Thank you for your cooperation in this study. I'm sure that it will be enjoyable and beneficial to all concerned.

Sincerely,

Lucille M. Krajacich

Lucille M. Krajacich, Principal

cc: Kathleen Johnson, Audiologist
Bill Prickett, Superintendent

LMK/jn

University of Montana
Department of Communication Sciences and Disorders • Speech, Hearing, and Language Clinic
Missoula, Montana 59812 • (406) 243-4131

Dear Parent(s):

My name is Rachel Glazer and I'm studying speech-language therapy at the University of Montana. I am conducting a study at the Montana School for the Deaf and Blind (MSDB) as part of my master's degree requirements. This study would benefit your child in that it would provide information about your child's vocabulary abilities. It would also provide professionals with information on vocabulary testing.

For this study, I will give two vocabulary tests to children at MSDB in September. For both tests, I will sign and say a word to the child. Then the child will select the picture that matches the word I signed/said. It takes 20 minutes to administer each test. Enclosed is a more detailed description of this study.

I would like permission to include your child in this study. If you would like to participate you need to sign the enclosed permission slip and return it in the enclosed envelope. Your cooperation is greatly appreciated.

If you have any questions, please call me in Missoula at 549-7542 or contact Lucille Krajacich or Kathy Johnson at MSDB at 453-1401. Thank you.

Sincerely,

Rachel Glazer, B.S.
Dept. of Communication Sciences and Disorders
University of Montana

Donald M. Goldberg, Ph.D.
Dept. of Communication Sciences and Disorders
University of Montana

APPENDIX D

Consent Form

University of Montana

* * * BASIC CONSENT FORM * * *

CERTIFICATION OF SUBJECT CONSENT BY LEGALLY AUTHORIZED REPRESENTATIVE

Project Title: _____

Investigator: _____

* *

I, _____, the _____ of
(relationship/legal status)
_____, hereby certify that I have been informed
(child's name)(subject)
by Rachel Glazer (graduate student, University of Montana) about my child's participation in a research study which will compare two measures of vocabulary understanding (The Peabody Picture Vocabulary Test-Revised and the Total Communication Receptive Vocabulary Test). I have been informed about the procedures to be followed and the amount of time involved. I understand there are no risks to the subject. I have been informed about the possible benefits to the subject and to others from the research. I have also been informed that the records identifying the subject will be kept confidential.

A written summary describing this research is attached. I have been given adequate opportunity to read it.

I understand I have the right to contact Rachel Glazer or Donald M. Goldberg at the University of Montana (406-243-4131) if I have any questions about this research or my rights.

In the event that your child is physically injured as a result of this research, you should individually seek medical treatment. If the injury is caused by the negligence of the University or any of its employees, you may be entitled to reimbursement or compensation pursuant of the Comprehensive State Insurance Plan established by the Department of Administration under the authority of M.C.A., Title 2, Chapter 9. In the event of the claim for such physical injury, further information may be obtained from the University Legal Counsel.

I understand that I have the right to withdraw from this consent to take part in the project at any time and withdraw my child from the project without penalty or loss of benefits to which he/she may be entitled.

I hereby freely consent to _____ participation in this project.
(child's name)

_____
(signature of legally authorized representative)

(over for description of research)

University of Montana

INFORMATION SUMMARY FOR PARENTS/GUARDIANS

* *

The purpose of this research study is to compare performance on two receptive vocabulary tests, the Peabody Picture Vocabulary Test-Revised and the Total Communication Receptive Vocabulary Test. I would like to determine if your child's score on one test is similar to his/her score on the other test. This will help determine the value of each test as a vocabulary measure for hearing-impaired children. This information will provide educational professionals with important information regarding the use of these two tests.

If you agree to allow your child to participate in this study, he/she will be given each of the two tests. For each test, the examiner presents a vocabulary word using total communication (sign and speech) and your child is then asked to select the appropriate word from a selection of four pictures. This is a commonly used assessment procedure which most children enjoy. If your child demonstrates signs of fatigue or discomfort during the assessment, the testing will be discontinued. The administration of each test will take approximately one half hour.

Participation in this study is strictly voluntary. Even if you agree to participate, you are free to withdraw at any time. The results of the study will be kept strictly confidential. Your child's name and any identifying information will be removed from my research files.

Your participation in this study is greatly appreciated. This study will help us learn more about the assessment measures used for hearing-impaired children.

I have read the above description of the research study to be conducted by Rachel Glazer at the Montana School for the Deaf and Blind. I understand the procedures and benefits involved in the participation in this study and that there are no risks.

I give my permission for my child _____
(child's name)

to participate in this study.

_____ _____
Parent/Guardian Date

APPENDIX E

Letter Thanking Participants in the Study

University of Montana
Department of Communication Sciences and Disorders • Speech, Hearing, and Language Clinic
Missoula, Montana 59812 • (406) 243-4131

December 8, 1988

Dear Parents:

I would like to thank you for allowing your child to participate in my research project at the Montana School for the Deaf and Blind. With your help, we now know a little more about measuring vocabulary for hearing-impaired children.

A total of ten children participated in the study. Two vocabulary tests, the Peabody Picture Vocabulary Test and the Total Communication Receptive Vocabulary Test wer given to each child. All of the children did better on the Total Communication Receptive Vocabulary Test. Since this test was designed for hearing impired children, the test items were more appropriate for the children in this study. One problem with the test, however, was that it did not have enough test items for the older children. In addition, both tests had items which were not appropriate for vocabulary testing for hearing-impaired children.

The results of this study will be made available to the school in January. If you would like additional information, please contact either the school or myself. I can be reached at (406) 226-9249. Once again, thank you for your assistance.

Sincerely,

Rachel Glazer, B.S.
Graduate Student
Department of Communication Sciences and Disorders
University of Montana