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Children's knowledge of receptive vocabulary : implications for development of a picture-pointing word-identification task

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development of a picture-pointing word-identification task**

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San Jose State University, 1992

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CHILDREN'S KNOWLEDGE OF RECEPTIVE VOCABULARY:
IMPLICATIONS FOR DEVELOPMENT OF A
PICTURE-POINTING WORD-IDENTIFICATION TASK

A Thesis

Presented to

The Faculty of the Division of
Special Education and Rehabilitative Services
Program in Communication Disorders and Sciences
San Jose State University

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts

By

Cynthia M. Bearce

May, 1992

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ABSTRACT

Children's Knowledge of Receptive Vocabulary: Implications for the Development of a Picture-Pointing Word-Identification Task

By Cynthia M. Bearce

The purpose of this investigation was to determine if the pictures of the Picture Identification Task (Wilson and Antablin, 1980) were easily recognizable by young children. Subjects were 16 four year old children. The 217 target words of the Picture Identification Task are displayed within one hundred templates consisting of four color pictures arranged in quadrants. These templates were shown to each child. The child was asked to say the name of each picture on the template. If any verbalizations were incorrect on a template, the child was given the target word and asked to point to the picture that represented that word. For example, on the template containing the words "ring," "wing," "sing," and "king," if the child identified "king" as "crown," the investigator would say, "show me the king." The child then identified the picture he believed represented the target word. The results indicate that the majority of the pictures are easily identifiable by all of the subjects. These results will provide information for standardizing the Picture Identification Task with young children.

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CHAPTER I

INTRODUCTION

Word recognition, the ability to identify words presented to a listener through headphones or speakers, plays an important role in any audiological evaluation, whether it be with adults or children. Word recognition scores for children are used to determine the degree of clarity with which the child hears speech. The tests usually consist of auditory recordings of lists of words with phonetic composition covering the range of sounds in the language. The subject listens to the words at a comfortable volume and responds orally by repeating the auditory stimulus. This method is not always the most appropriate. For non-verbal adults and/or children with articulation problems or language delays, the audiologist must use auditory/visual tests to obtain an estimate of word recognition. Here, the patient responds by pointing to the word, picture, or sentence representing the auditory stimulus.

Several auditory/visual test materials are available today. These include the Word Intelligibility by Picture Identification (WIPI, Ross & Lerman, 1970), The Northwestern University Children's Perception of Speech Test (NU-CHIPS, Katz & Elliot, 1978), The Pediatric Speech Intelligibility Test (PSI, Jerger, Lewis, Hawkins, & Jerger,

1980; Jerger, Jerger, & Lewis, 1981; Jerger & Jerger, 1982; Jerger, Jerger & Abrams, 1983) and The Picture Identification Task (PIT, Wilson & Antablin, 1980 and 1982).

Presently, the Picture Identification Task is the only word recognition test available for use with a computer (McCullough, Cunningham, & Wilson, 1992). The computer version consists of a word pointing task applicable for fourth grade children. The test is also available in booklet form as a picture pointing task. The use of computers in word recognition testing is "state of the art" and it aids in the timely and accurate assessment of a person's word recognition abilities. With computers leading our society in technological advances, the audiologist is going to find an increase in computer use for all areas of hearing evaluation.

The development of age-appropriate vocabulary items is critical for pediatric materials. However, there does not seem to be a specified way to determine the words to be used in an auditory discrimination task. The authors of the WIPI chose their words from children's books and word count lists. Here, questionable choices were shown to experienced kindergarten and nursery school teachers for their judgement of inclusion in the test. Target words for the NU-CHIPS test were selected based on common monosyllabic nouns found in children's

books. The test items also were selected based on ease of picture identification. For the PSI, the authors reviewed the normal development of nouns and verbs. Nouns used in the study were primarily concerned with food, clothing, animals, toys and vehicles. Verbs were chosen based on the fact that the earliest verbs in children's vocabularies are action, process, or voluntary verbs. The authors of the Picture Identification Task chose their vocabulary items from the "Teacher's Word Book of 30,000 Words." Their emphasis was on consonant-vowel nucleus-consonant words and three rhyming alternatives that were able to be illustrated simply. The word lists were compiled to approximate traditional word recognition test materials and to conform to the Lehiste and Peterson (1959) criteria of phonemic balance.

Statement of the Problem

Presently, the Picture Identification Task is only normalized on non-verbal adults (picture pointing portion) and on fourth grade children (computerized word pointing portion). In order for the test to be applicable to a more diverse population, the test materials must be normalized for children of other age groups. To obtain data from young children, it must first be determined if the hand-drawn pictures actually represent their target words. It is important that the pictures be very clear and not ambiguous to young children. Second, it must be determined if the vocabulary items represented by the pictures are age appropriate. That is, for a given age group, can the children recognize the target word by the drawn picture.

Purpose of the Study

This study had two purposes. The first objective was to determine if the hand-drawn pictures of the Picture Identification Task actually represent the predetermined target word to young children. The second objective was to determine if four year old children could recognize the pictures as the target word.

Hypothesis

It was hypothesized that:

1. The hand-drawn pictures of the Picture Identification Task would be easily recognizable as their predetermined target word by young children.

2. The data would provide information regarding the age appropriate levels of the Picture Identification Task. This information will be important when determining age levels in which to standardize the Picture Identification Task in the complete auditory/visual test paradigm.

CHAPTER II

REVIEW OF THE LITERATURE

Word Intelligibility by Picture Identification

Ross and Lerman (1970) established a closed set word identification test known as the Word Intelligibility by Picture Identification test (WIPI). It was established for use with hearing impaired children. The test consists of 26 picture plates made of six pictures on each plate. The test was evaluated on 61 hearing impaired children ages 4 years 7 months of age to 13 years 9 months of age. The test has four lists which may be interchanged with the same set of templates. Of the six pictures on each plate, only four are used as test stimuli.

Each subject was administered all four lists at a 40 dB sensation level as referenced to the subjects pure tone average. The order of list presentation was rotated between subjects. Each word was preceded by the carrier phrase, "Show me." One to four weeks after the initial testing, the subjects returned for retesting.

It was found that all four lists were equivalent and highly reliable. The test is simple and rapid and the children had little difficulty comprehending the directions. The test was deemed suitable for children from the ages of five or six with

moderate losses and from ages seven or eight with severe hearing losses. Children with conductive or minimal sensorineural hearing losses will consistently have scores at or close to 100 %. Most of these children can be tested with conventional speech discrimination tests.

Sanderson-Leepa and Rintlemann (1976) studied the performance of normal hearing children on three types of speech discrimination tests. Those tests were a) the WIPI, a nonverbal closed set test, b) the Phonemically Balanced Kindergarten Word Lists (PBK-50), an open-set test for children, and c) the Northwestern University Auditory Test Number 6 (NU No. 6), an open-set test for adults. This study used 60 normal hearing children divided equally between the ages of three and one half, five and one half, seven and one half, nine and one half, and eleven and one half years of age. The number of tests and sensation levels varied according to age.

Results showed that the WIPI yielded the highest scores, followed by the PBK-50 test and finally the NU No. 6 was most difficult. The WIPI and the PBK-50 tests were found to be the best measurements when determining if a child's hearing is within normal limits. For evaluating a hearing aid or determining differences in auditory discrimination ability between ears, the NU No. 6 test is the best since it is the more

difficult test and will give a wider spread of discrimination scores.

One further study using the WIPI looked at children's ability to recognize words in noise (Papso and Blood, 1989). Subjects in the study were 30 children ages four years zero months to five years ten months and 30 adults ages 19 to 28 years. The WIPI was administered to both groups in quiet, with pink background noise and with multitalker background noise. The background noise was presented at a signal-to-noise ratio of +6 dB. Results showed that all subjects achieved speech discrimination scores of 88-100% in the quiet condition. The group of children has significantly poorer performance than the adults with the presence of background noise. The children had a greater difficulty recognizing words in a background of multitalker noise than in pink "non -speech" noise. However, the multitalker mimics a more realistic situation.

Northwestern University Children's Perception of Speech Test

In 1978, Katz and Elliot developed their version of a word recognition test, the Northwestern University Children's Perception of Speech test. This test is similar to the WIPI (Ross & Lerman) in that it also is a closed-set auditory/visual test that uses monosyllabic words requiring a picture pointing

response. This test is appropriate for testing children who have a minimum receptive vocabulary level as young as three years. The test consists of four randomizations of 50 words, male and female talker recordings, and two picture response booklets. The words are represented by black line drawings on a white background. Each template contains four pictures in a quadrant format with one picture representing the target word.

Katz and Elliot (1978) completed several tests on their auditory/visual test materials. They looked at possible learning effects, reliability of test form and half-list equivalence, performance-intensity functions for three year olds, male versus female talker, familiarity of the items to hearing impaired children, relationship of performance to hearing level, and comparison to the WIPI. Subjects in the evaluation of the NU-CHIPS test were normal hearing and hearing impaired children. The investigators concluded that 1) successive presentations of the NU-CHIPS test are appropriate in routine clinical testing; 2) half lists provide approximately equivalent measures of performance; 3) performance-intensity functions occurred at low sensation levels (18 and 24 dB); and 4) the test forms (male-talker version) had equivalent means and variances among normal and hearing impaired children. Their research also suggested that the test is appropriate for hearing impaired

children with a receptive language age of two years six months and that the test had good reliability demonstrated by the fact that profoundly hearing impaired children performed more poorly than moderately hearing impaired who, in turn, performed more poorly than normal hearing children. Finally, high correlations were noted between performance on the NU-CHIPS test and the WIPI test.

Dengerink and Bean (1988) conducted research with forty 5-year-old children and found that at least 5% of the children missed five items on the NU-CHIPS test and seven items on the WIPI test. Visual recognition of the target picture appeared to be important since an incorrect response may have been due to the child's inability to correctly identify the picture, rather than the child's receptive auditory capabilities. (Olsen & Matkin, 1980)

Pediatric Speech Intelligibility Test

The Pediatric Speech intelligibility Test (PSI, Jerger, Lewis, Hawkins & Jerger, 1980; Jerger, Jerger & Abrams, 1983) is another word recognition test for use with children. The test was normalized using 87 children ages three years three months to six years eight months. The children were grouped in one year intervals (three year zero months to three

year eleven months, etc.) Each child was first administered the Peabody Picture Identification Test (PPVT) and the Northwestern Syntax Screening Test (NSST). Results of the PPVT showed that performance was above the 50th percentile (age level) for each age group. The results of the receptive portion of the NSST were at age level in the three and six year old groups and above average in the four and five year old groups. The NSST expressive section yielded performances slightly below age level in the three year old group, at age level in the four and six year old groups and above average in the five year old group. In relating the PPVT and NSST scores, Jerger found that expressive language was either slightly advanced or consistent with receptive language skills in all children.

The children then were asked to respond to 60 stimulus cards. Thirty of these cards represented monosyllabic words which were pictures of nouns, and the other 30 cards represented actions which were pictures of animals engaged in common activities. The pictures were selected based on the normal development of first vocabularies. The nouns were primarily types of food, clothing, animals, toys, and vehicles. The sentence stimulus cards were based on a child's first verbs which were determined as action, process, or voluntary verbs.

For each word card, the carrier phrase, "What is this?" was used and for each sentence card, the carrier phrase, "What is happening in this picture?" was used

Responses to the sentence cards fell into four "sentence-type" categories:

- A. Article noun/auxiliary verb-ing/article noun
ie: A rabbit/is reading/a book.
- B. Pronoun/auxiliary verb-ing/article noun
ie: He/is reading/a book.
- C. Article noun pronoun/auxiliary verb-ing/article noun
ie: A rabbit (He)/is reading/a book.
- D. Article noun/verb-ing/article noun
ie: A rabbit/reading/a book.

Jerger found that those children having a more adult like response (pattern A) had a vocabulary and receptive language abilities more advanced than any of the other groups. Because of the differences in vocabulary and receptive language skills between the age groups, it was determined that two sets of sentence materials were needed.

One set, called Format I, would have the carrier phrase, "Show me _____," (Show me a bear is brushing his teeth.) and

the second set, Format II, would have no carrier phrase (A bear is brushing his teeth.). From the original 30 sentence cards, only ten were selected for inclusion in the test. A card was selected if 80% of children producing pattern A responses responded semantically and syntactically equivalent to the target for that card, "A bear is combing his hair."

Since there was no great difference in the responses to the word cards as related to chronological age, PPVT scores or NSST scores, all responses were evaluated. For 20 of the 30 word cards, the target word was reached 95% of the time. These words were included in the test. Thus, the PSI test is made up of 20 word cards and two sets of ten sentence cards.

In 1981, Jerger, Jerger, and Lewis completed further research on the PSI. Two of the studies looked at the validity of the Format I and Format II sentence stimuli in order to equate the performances of young children with differing receptive language abilities. The third study looked at the influence of receptive language on word intelligibility of the PSI.

In the first study, Jerger, et al, studied the effect of receptive language abilities on the PSI sentence formats. All subjects were given a pure tone threshold test, NSST, either Format I or Format II PSI sentence cards and the word section

of the PSI. The test items and competing message were administered in the sound field. The sentences were given at +10 dB to -20 dB message-to-competition ratios (MCRs) and the words were given at +10 dB to -4 dB MCRs.

The subjects were 24 children ages three years four months to nine years zero months. Results indicated that all PSI sentence materials were too easy for testing children with receptive language scores at 37 to 40 based on the NSST. Format II sentences were too difficult for children with a low receptive language score of 15 to 31 and Format I sentences were too easy for children with higher receptive language scores of 32 to 36 on the NSST. In conclusion, it was found that the two PSI sentence formats can be used to control the influence of receptive language ability on the sentence portion of the PSI test.

The second study was intended to establish criteria for selecting the correct PSI sentence format. The study consisted of 50 children ranging in age from three years four months to nine years zero months. The results of this study correlated with those of study one. For NSST receptive language scores of 15 to 31, Format I sentences should be used. For scores of 32 to 36, Format II sentences should be used. The test is inappropriate to use with any other NSST scores.

Study three investigated the effect of receptive language ability on monosyllabic word intelligibility. The subjects were 40 children ages three years two months to six years nine months. Of the 40 subjects, 20 qualified for Format I sentences and 20 for Format II sentences. Results indicated that the performance for PSI word materials is not affected by receptive language differences. It was also determined that age and sex had no effect on the word intelligibility scores.

Picture Identification Task

The Picture Identification Task (Wilson & Antablin 1980, 1982) was developed to estimate the word recognition performance of nonverbal adults. The test is comprised of four lists of 50 phonemically balanced monosyllabic words. Two experiments were conducted. In experiment one, performance intensity functions for the Picture Identification Task and the NU No. 6 lists were obtained in quiet and in noise. Words were presented in quiet in 4 dB increments from -2 dB to 26 dB. In noise, the signal to noise ratios ranged from -12 dB to 16 dB. These levels were referenced to the individual's Speech Reception Threshold. The 16 subjects were instructed to write the word they heard. Results indicated that the performance-intensity functions obtained with the Picture Identification

Task in an open set paradigm were equivalent to the functions obtained with the NU No. 6 lists.

In experiment two, the closed-set responses to the Picture Identification Task were compared to both open and closed set response paradigms of the NU No. 6 lists. For the Picture Identification Task, the subjects responded by pointing to the picture representing the stimulus word. There were three foils. For the open-set paradigm of the NU No. 6 material, the subjects wrote the word. For the closed-set paradigm, the subjects chose one of four written words. Results determined that performance-intensity functions were affected by the type of response. The easiest task was found to be the closed-set response to words followed by the closed-set response to pictures. The most difficult task was the open set response. However, all three response modes yielded equivalent results at a high level.

In 1982, Wilson and Antablin evaluated the Picture Identification Task in the clinical setting with non-verbal adults (mild aphasic, moderate aphasic, glossectomy, or laryngectomy). The 28 subjects were grouped according to the severity of their communication disorder. The first group was comprised of subjects who were able to comprehend and respond verbally. They were evaluated using the Picture

Identification Task (closed set response) and the NU No. 6 (open set response). The second group of subjects were unable to respond verbally, therefore, only the Picture Identification Task picture pointing paradigm was used. All subjects had similar mild to moderate high frequency hearing losses from 2000 to 8000 Hz.

Each test was administered at both 50 dB HL and at 70 dB HL. The 50 dB HL presentation level was used to assess speech discrimination at a normal conversation level and 70 dB HL was used to assess maximum word recognition performance.

Results indicated that the first group performed better on the Picture Identification Task closed set than on the NU No. 6 open set. Scores of the NU No. 6 were similar to those achieved by verbal adults with similar hearing losses. The second group performed similarly on the Picture Identification Task compared to the first group. It was determined that the Picture Identification Task is a good measure of word recognition performance.

The Picture Identification Task was recently standardized on a group of fourth grade students ages nine years one month to eleven years four months (McCullough, Cunningham, & Wilson, 1992). The response portion of the Picture

Identification Task incorporated the use of a computer. Written words were presented in a quadrant format with one word being the target and the other three being the foils. The words were displayed on a computer monitor. Each subject was required to meet normative criteria for otoscopy, screening immittance audiometry, pure tone audiometry, and Speech Reception Thresholds. The subjects were also given the Wide Range Achievement Test (WRAT) in which the subjects had to meet the fourth grade reading level criteria of the Reading Level I portion.

The Picture Identification Task was administered in both quiet and in noise and in both a chosen set (pointing to the written word on the computer) and an open set (repeating the stimulus word orally) paradigm. The Picture Identification Task computerized written word portion was found to be appropriate for children with a fourth grade reading level. At a -8 dB signal to noise ratio, the subjects were able to correctly identify 86.6% of the target words by pointing to them on a computer monitor. Seventy-five percent of the subjects felt that pointing to the word was easier than repeating the word. Thus, the written word portion of the Picture Identification Task on the computer monitor was established as a standardized, successful way of assessing word recognition.

CHAPTER III

METHODOLOGY

The Instrument

The pictures from the Picture Identification Task (Wilson & Antablin, 1980) served as the test materials. The test consists of 217 target and alternative words displayed on templates consisting of four pictures on each. The words represented in the Picture Identification Task picture booklet are monosyllabic words with an emphasis on consonant-vowel nucleus-consonant structure. The words were compiled to approximate traditional word-recognition test materials and to conform to the Lehiste and Peterson (1959) criteria of phonemic balance. All the words were simple nouns and verbs chosen from the "Teacher's Word Book of 30,000 Words."

Subjects

Subjects for this study consisted of 16 four year old children. Subjects were tested at a parent participation preschool in San Jose, CA. The subjects represented a culturally and socioeconomically diverse population.

Procedure

Each child was seated at a table in an empty room with the investigator. Since results of any auditory speech discrimination task may be influenced by differences in receptive language ability (Elliot, 1979; Mills, 1977), the child was first administered the Peabody Picture Vocabulary Test (Dunn & Dunn, 1981). The subjects were asked to point to the picture which represented the spoken target word. Words were given in increasing difficulty until the child missed six of eight consecutive items. This test yielded age level scores for single-word receptive vocabularies.

The subjects were then asked to look at 60 different templates containing the pictures of the Picture Identification Task. Templates consisting of repeated pictures were not used. As the investigator pointed to a picture on the template, the child expressively answered the question, "What is this?" If the subject incorrectly identified a word, the investigator would say, "Show me _____," before continuing to the next template. The subject then responded by pointing to the picture that represented the auditory stimulus word. This task was completed for each template containing different words.

Each child took approximately 30 minutes to complete the task. Only two children required a break during the testing

session. At times it was difficult for the children to concentrate since they knew the other children were outside playing. Occasionally a parent helper would come into the room to obtain materials. This also seemed to distract the children; however, all children completed the task.

Data Analysis

Percent correct identification/recognition for the pictures in the Picture Identification Task was obtained for each subject in both expressive and receptive conditions. These responses then were calculated and averaged to obtain mean percent correct identification for each item to establish the relationship between receptive and expressive language learning abilities for these materials. The analysis also provided information regarding the appropriateness for use of these test materials with four year old children.

CHAPTER IV

RESULTS AND DISCUSSION

The first purpose of this study was to determine if the pictures of the Picture Identification Task represented predetermined target words to young children. The second purpose was to determine if the children could recognize the picture representing the target word. Analysis included establishing a percent correct range and mean for both the expressive and receptive test conditions and conducting an item analysis of the 217 words included in the Picture Identification Task.

Chronologic Age as Compared to Receptive Vocabulary Age

Table 1 displays the subject age, receptive language score based on the Peabody Picture Vocabulary Test, percentage correct of expressive responses and percentage correct of receptive responses. While chronological age ranged from four years zero months to four years eleven months with a mean chronological age of four years seven months, receptive language age levels ranged from three years five months to six years seven months with a mean receptive language age level of four years eleven months. The average receptive

Table 1

Subject	Age	PPVT	Expressive	Receptive
1	4:0	4:7	47 %	87 %
2	4:3	4:7	42 %	92 %
3	4:3	6:7	52 %	94 %
4	4:4	5:0	48 %	86 %
5	4:4	6:5	54 %	96 %
6	4:7	4:5	45 %	89 %
7	4:7	4:6	42 %	92 %
8	4:8	3:5	23 %	80 %
9	4:9	3:8	40 %	83 %
10	4:9	4:9	42 %	84 %
11	4:9	5:0	47 %	92 %
12	4:10	4:6	46 %	90 %
13	4:10	4:7	44 %	93 %
14	4:10	6:2	52 %	96 %
15	4:11	4:9	53 %	90 %
16	4:11	5:7	54 %	94 %
mean	4:7	4:11	46 %	90 %
S.D.	0:3	0:10	7.6%	4.7%

Subject age, receptive vocabulary age level, expressive
and receptive performances

vocabulary age level was slightly higher than the average chronological age. Seven of the 16 children had a receptive vocabulary age level lower than their chronological age. Of the other nine children, six had a receptive vocabulary age level at least six months above their chronological age level.

Expressive and Receptive Percent Correct Performance

The mean percent correct for the expressive test condition was 46% while the mean percent correct for the receptive test condition was 90%. The data in the table indicate that each subject performed significantly better (37% to 57%) between the expressive and receptive test conditions. Several words such as lake, dime and sail each were expressively identified by only 7% of the subjects; however, these words were receptively identified by 100% of the subjects. These data support the premise that children understand much more than they produced (Nelson & Bonvillian, 1978; Chapman, 1981). Receptive understanding of a word has less obstructing factors as compared to correctly expressing a word. For example, a child must work on motor control, execution, and complete understanding before a word may be identified expressively. These obstructions are eliminated during a receptive task. Age and experience with language influence

the expressive and receptive language abilities of a child.

Receptive Performance Analysis

Since the Picture Identification Task is administered as a receptive task, further analysis of the receptive test condition was conducted. An item analysis was performed on each word for the receptive test condition to determine the number of correct responses for each target word. These data are displayed in Table 2. Thirty of the target words were incorrectly identified by more than 25% of the subjects. Conversely, 187 items were correctly identified by 75% of the subjects. These data support the hypothesis that the majority of the hand-drawn pictures of the Picture Identification Task are easily recognizable as their predetermined target word by young children.

Possible reasons for items incorrectly identified have been hypothesized. One possible reason is that the incorrectly identified words are not in an average four year old's receptive language. The target word "putt" was correctly identified by 31% of the children. "Putt" is only a portion of the game of golf; therefore, children are more often exposed to the word "golf" than the word "putt." The target word "shawl" also was correctly identified by only 31% of the children. While a shawl

Table 2

Percent correct for each target word

Word	% correct	Word	% correct	Word	% correct
shawl	31 %	crook	68 %	curl	87 %
gauge	31 %	beef	68 %	twirl	87 %
putt	31 %	thief	68 %	sub	87 %
bum	31 %	cab	68 %	page	87 %
dam	37 %	pass	68 %	wheat	87 %
noose	37 %	tack	68 %	top	87 %
peak	37 %	match	75 %	shed	87 %
mine	37 %	club	75 %	cash	87 %
twig	43 %	stage	75 %	beak	87 %
yam	50 %	cap	75 %	gum	87 %
pearl	50 %	calf	75 %	lace	87 %
grave	50 %	note	75 %	heel	87 %
choir	50 %	wine	75 %	wing	87 %
hog	50 %	sack	75 %	moose	93 %
core	50 %	chip	81 %	whip	93 %
shack	50 %	cub	81 %	wave	93 %
bill	56 %	coke	81 %	shave	93 %
frown	56 %	mop	81 %	pill	93 %
veil	56 %	badge	81 %	cage	93 %
vine	56 %	lap	81 %	dial	93 %
mill	62 %	jog	81 %	dice	93 %
wig	62 %	load	81 %	bun	93 %
hut	62 %	cone	81 %	jug	93 %
kneel	62 %	cane	81 %	gown	93 %

Table 2 (cont.)

Percent correct for each target word

Word	% correct	Word	% correct	Word	% correct
catch	93 %	wheel	93 %	snake	100 %
log	93 %	sing	93 %	cake	100 %
cook	93 %	king	100 %	rake	100 %
hook	93 %	lamb	100 %	ball	100 %
rose	93 %	girl	100 %	doll	100 %
roast	93 %	juice	100 %	wall	100 %
jail	93 %	goose	100 %	tub	100 %
chalk	93 %	ship	100 %	hill	100 %
hawk	93 %	lip	100 %	sock	100 %
chief	93 %	cave	100 %	clock	100 %
mowed	93 %	chain	100 %	knock	100 %
path	93 %	plane	100 %	rock	100 %
pour	93 %	rain	100 %	dive	100 %
bar	93 %	nose	100 %	dime	100 %
chick	93 %	bows	100 %	meat	100 %
tool	93 %	hose	100 %	feat	100 %
cheese	93 %	toes	100 %	seat	100 %
keys	93 %	map	100 %	pan	100 %
mice	93 %	mask	100 %	can	100 %
rope	93 %	man	100 %	fan	100 %
bone	93 %	tire	100 %	comb	100 %
stone	93 %	fire	100 %	dig	100 %
face	93 %	wire	100 %	pig	100 %
vase	93 %	lake	100 %	stop	100 %

Table 2 (cont.)

Percent correct for each target word

Word	% correct	Word	% correct	Word	% correct
shop	100 %	coat	100 %	star	100 %
head	100 %	laugh	100 %	car	100 %
bed	100 %	lamp	100 %	sign	100 %
sled	100 %	dog	100 %	sick	100 %
sun	100 %	leak	100 %	lick	100 %
gun	100 %	cheek	100 %	stick	100 %
run	100 %	thumb	100 %	mail	100 %
cut	100 %	drum	100 %	back	100 %
nut	100 %	book	100 %	stool	100 %
rug	100 %	robe	100 %	pool	100 %
hug	100 %	jet	100 %	school	100 %
bug	100 %	pet	100 %	bees	100 %
chair	100 %	net	100 %	knees	100 %
pear	100 %	wet	100 %	rice	100 %
hair	100 %	sail	100 %	slice	100 %
bear	100 %	nail	100 %	lock	100 %
bath	100 %	ham	100 %	phone	100 %
town	100 %	ring	100 %	race	100 %
clown	100 %	toad	100 %	peel	100 %
kite	100 %	road	100 %	rat	100 %
bite	100 %	pack	100 %	hat	100 %
night	100 %	door	100 %	cat	100 %
light	100 %	store	100 %	bat	100 %
boat	100 %	jar	100 %	leaf	100 %
goat	100 %				

used to be a popular item of clothing, it is now rare to see a person wearing a shawl.

Another possible reason for errors in recognizing pictures is that, to a four year old, the hand drawn picture does not accurately portray the target word. The target word "beef" is represented by a side of beef on a hook. Only 68% of the children were able to correctly identify this word. To children, beef comes on a styrofoam plate with a plastic cover; not hanging on a hook. The target word "coke" is represented by an old fashioned bottle of coca-cola. This word was missed by 19% of the children. Coke has not been available in this type of bottle for many years. Four year old children are only familiar with coke in aluminum cans. Some of the pictures have several possible names. For instance, the target word "frown" is represented by a man's face frowning. This picture could be identified as other target words represented by similar pictures: man, face, frown, or even head. The frown is not the main focal point in the picture. This picture was correctly identified by only 56% of the children. The picture representing a "twig" was correctly identified by only 43% of the children. This picture could represent twig, branch, or stick. It is interesting to note that the target word "stick" was correctly identified by all 16 children.

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Clinical Test Administration Implications

Based on the results of this investigation, it is important to modify the test for four year old children. Because this is a recognition task, incorrect responses must be a result of receptive auditory abilities only. Omitting templates which consist of several frequently missed words would decrease the errors. Table 3 contains seven templates which would be best omitted. Omitting these templates would eliminate 14 of the 30 most frequently missed words.

The Picture Identification Task consists of four equivalent word lists (Appendix A). Word lists 1A, 1B, and 2A each use three or four of the 30 most missed words as target words. List 2B, however, uses only one of the thirty words. If the seven templates were omitted, word lists 1A and 1B would still have two of the most missed words as target words. List 2A would only contain one most frequently missed word and list 2B would contain zero. Ideally, list 2B should be used with four year old children and list 2A should be used if further lists are needed. It is important to remember that the 30 most missed words would still appear as rhyming alternatives.

Another approach would be to arrange the templates into new lists. Use of the templates which contain only the words that were easily identified would reduce the variability of

Table 3

Templates to be omitted

Word	% correct	Word	% correct
yam	50 %	back	100 %
lamb	100 %	shack	50 %
dam	37 %	tack	68 %
ham	100 %	sack	75 %

Word	% correct	Word	% correct
vine	56 %	dig	100 %
mine	37 %	twig	43 %
sign	100 %	pig	100 %
wine	75 %	wig	62 %

Word	% correct	Word	% correct
hut	62 %	pill	93 %
cut	100 %	hill	100 %
putt	31 %	mill	62 %
nut	100 %	bill	50 %

Word	% correct
beef	68 %
thief	68 %
chief	93 %
leaf	100 %

errors. Errors would occur only as a result of receptive auditory ability. Caution must be used to keep the same phonemic balance as the original lists.

Implications for Future Research

Results of this study indicate that a majority of the pictures in the Picture Identification Task were easily recognized by the four year old subjects. Future research is needed to determine if a list of the most commonly recognized words would be appropriate for use with three year old children. Several of the templates consisted of words that were correctly identified receptively by all of the subjects. A list of these templates is displayed in Table 4. Since these words were easily recognizable by all the four year old subjects, these templates would be best included in a list for three year old children.

Table 4
Templates correctly identified by all subjects

nose	bows	hose	toes
lake	snake	cake	rake
sock	clock	knock	rock
pan	man	can	fan
light	night	kite	bite
net	pet	jet	wet
rat	cat	hat	bat
chair	pear	hair	bear

Future investigations should explore the use of color pictures of the target words represented on a computer monitor. In a society where children are very oriented to the television, pointing to pictures on a computer screen should be an easy task. With the implementation of touch sensitive screens, the subject will be able to control the speed of stimulus presentation. The audiologist also will be able to control the entire administration of the test from the audiometer. Enhanced graphics will allow the pictures to be more realistic looking, therefore limiting incorrect responses

due to not recognizing a picture. With today's technology, digitizing the pictures on a computer file can easily be accomplished. This would allow for manipulating the order and speed of template presentation.

It is difficult for the audiologist to assess word-recognition ability in foreign speakers. However, auditory/visual test materials recorded in the foreign language would allow the audiologist to administer an accurate word recognition test. Future research will include translating the Picture Identification Task into various languages and standardizing the materials with foreign speakers.

CHAPTER V

SUMMARY

The Picture Identification Task (Wilson & Antablin, 1980) was developed for use with adults who, because of a disability, were not able to verbally respond to traditional word-recognition tests. This auditory/visual test material is comprised of 100 templates consisting of four color pictures arranged in quadrants. The test administrator would say the target word and the subject would point to the picture that represented the auditory stimulus.

It is very difficult for young children to respond to traditional word-recognition tests. A picture pointing response to an auditory stimuli is much easier for a child. It was believed that the pictures from the Picture Identification Task would be easily recognizable by young children since they consisted of common nouns and action verbs. The different pictures were shown to 16 four year old children. The children were asked to say the name of the various pictures shown to them. If any verbalizations were incorrect on a template, the child was given the target word and were asked to point to the picture that represented the target word. For example, on the template containing the words "ring," "wing," "king," "and "sing,"

if the child identified the "king" as "crown," the investigator would say, "Show me the king." The child then identified the picture he believed represented the target word. It was determined that the majority of the pictures were easily recognizable by all the children. These results will provide information for standardizing the Picture Identification Task with children of various ages.

These materials not only will be used with very young children, but also with children with limited language abilities or other communication difficulties such as articulation disorders. Currently, the pictures of the Picture Identification Task have been scanned onto a computer screen. Standardization of these computerized audio/visual test materials is a high priority.

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Appendix

Picture Identification Task
Word List 1A

<u>Target Word</u>	<u>Rhyming Alternative Foils</u>		
1. wing	sing	ring	king
2. yam	lamb	dam	ham
3. pearl	curl	twirl	girl
4. juice	goose	noose	moose
5. ship	whip	chip	lip
6. wave	shave	grave	cave
7. chain	plane	cane	rain
8. nose	bows	toes	hose
9. goose	noose	moose	juice
10. match	map	mask	man
11. tire	fire	wire	choir]
12. lake	snake	cake	rake
13. rose	hose	bows	nose
14. shawl	ball	doll	wall
15. sub	tub	cub	club
16. pill	hill	mill	bill
17. sock	clock	knock	rock
18. cage	gauge	page	stage
19. dive	dial	dice	dime
20. wheat	meat	feet	seat
21. pan	man	can	fan
22. coat	cone	coke	comb
23. dig	twig	pig	wig
24. fire	choir	wire	tire
25. top	stop	shop	mop

Appendix (cont.)

Picture Identification Task
Word List 1B

<u>Target word</u>	<u>Rhyming Alternative Foils</u>		
26. head	bed	sled	shed
27. bed	shed	sled	head
28. sun	gun	bun	run
29. run	bun	gun	sun
30. noose	juice	goose	moose
31. hut	cut	putt	nut
32. rug	jug	hug	bug
33. chair	pear	hair	bear
34. bath	back	bat	badge
35. town	gown	clown	frown
36. kite	bite	light	night
37. cash	catch	cap	calf
38. boat	note	goat	coat
39. laugh	lap	lamb	lamp
40. dog	log	hog	jog
41. mop	shop	stop	top
42. leak	cheek	peak	beak
43. thumb	bum	bum	drum
44. book	crook	cook	hook
45. girl	twirl	curl	pearl
46. road	rose	roast	robe
47. light	kite	night	bite
48. jet	pet	net	wet
49. veil	sail	jail	nail
50. mill	bill	hill	pill

Appendix (cont.)

Picture Identification Task
Word List 2A

<u>Target Word</u>	<u>Rhyming Alternative Foils</u>		
1. gun	run	bun	sun
2. dam	ham	lamb	yam
3. chalk	sock	hawk	rock
4. chief	beef	thief	leaf
5. load	toad	road	mowed
6. jail	veil	nail	sail
7. catch	cab	cat	cap
8. pass	path	pan	pack
9. door	pour	store	core
10. nail	veil	jail	sail
11. wig	dig	twig	pig
12. sail	veil	nail	jail
13. shop	mop	stop	top
14. wet	pet	net	jet
15. lamb	dam	yam	ham
16. jar	bar	star	car
17. vine	mine	sign	wine
18. sick	chick	lick	stick
19. mail	jail	veil	nail
20. back	shack	tack	sack
21. map	man	mask	match
22. man	fan	pan	can
23. feet	meat	seat	wheat
24. cave	wave	shave	grave
25. cut	putt	hut	nut

Appendix (cont.)

Picture Identification Task
Word List 2B

<u>Target Word</u>	<u>Rhyming Alternative Foils</u>		
26. tool	stool	pool	school
27. path	pan	pack	pass
28. sing	king	wing	ring
29. cheese	keys	bees	knees
30. dice	rice	slice	mice
31. hill	mill	bill	pill
32. rain	cane	plane	chain
33. bug	hug	jug	rug
34. hose	rose	bows	nose
35. gown	town	clown	frown
36. net	pet	jet	wet
37. shed	head	sled	bed
38. robe	road	rope	rose
39. rock	sock	clock	lock
40. bone	cone	phone	stone
41. face	race	vase	lace
42. thief	leaf	chief	beef
43. lick	chick	stick	sick
44. toad	load	road	mowed
45. page	gauge	cage	stage
46. night	kite	light	bite
47. hair	pear	chair	bear
48. wheel	peel	heel	kneel
49. rat	hat	cat	bat
50. log	dog	jog	hog