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A Comparison of Responses of Aphasics to Stimuli Presented by Pictures, Objects and Videotape

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A COMPARISON OF RESPONSES OF APHASICS TO STIMULI PRESENTED BY PICTURES, OBJECTS AND VIDEOTAPE

by

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TABLE OF CONTENTS

TABLE OF CONTENTS (continued)

LIST OF TABLES

LIST OF FIGURES

FIGURE PAGE

CHAPTER I

THE BACKGROUND AND PURPOSE OF THE STUDY

Introduction

Aphasia can affect all modalities of language (25,31). Although the modalities affected and the degree of impairment differs for each individual, word finding, particularly naming, constitutes one of the more prominent difficulties. Even when considerable improvement in general has occurred, anomia still presists as a residual problem (7). Schuell, Jenkins and Jimenez-Pabon (25) argue that the major difficulty of the aphasic is the production of a specific response which cannot be confined to the task of naming or to certain parts of speech.

It has been recognized that effective aphasia therapy should employ multi-sensory stimulation. Verbal cues and messages require analysis and integration, processes that are interrupted when a brain injury occurs. As a result the aphasic experiences distortions and partial information from his environment which in turn limits his ability to analyze the verbal cues. Recognizing this condition, the clinician must manipulate the stimulus to allow the aphasic to integrate and analyze the information.

One way to accomplish this is to employ a combination of auditory and visual stimulation (25). Bender (6) concluded from his study employing simultaneous stimulation, that the effect of one stimulus on another is a fundamental principle in perception and that a combination of visual and auditory stimuli evoked responses rather than inhibited responses to the stimuli.

Based on these principles, the therapy recommended for persons with word-finding difficulties has been very consistent. Wepman (30), Berry and Eisenson (7) and Agronowitz and McKeown (2) suggest that pictures be presented with combined auditory and visual stimulation. Schuell, et. al., (25) have indicated that for the various stages of language complexity, combined auditory and visual stimulation should be used to elicit language. The language skills become stabilized when the aphasic is able to respond to either auditory or visual stimulation on any of the stages of language complexity.

Aphasia therapy is frequently centered around the use of pictures and objects. The emphasis is directed toward assisting the client in language activities through drill. Typically, therapy is based on the recognition and naming of pictures of common objects. Because words are merely representative and do not contain an intrinsic likeness to the object, action or idea, the aphasic may experience difficulty in producing these verbal symbols

even when provided with pictures.

Williams and Gassel (33) suggest that the brain functions as a result of nervous excitations and that perception is the product of externally stimulated nervous excitation. The environment can only be truly represented when the excitations include temporal sequencing of events or if there is a similarity between the objects and excitations. The more accurate and exact the excitation or stimulus representations are, the more opportunity the aphasic will have to recall more language.

Because of the desirability of multi-sensory stimulation, audio-visual techniques provide a wider range of stimulation to enhance the relearning process. However, prior to videotape recording, employing audio-visual equipment as a therapeutic device was cumbersome, inconvenient, expensive and unrealistic for most clinical settings. Videotape has several unique characteristics which make its desirability and servicability applicable to the clinical environment.

According to Diedrich (11), videotape recording has the following distinct features: (1) It can be replayed directly after recording which provides immediate feedback[1]

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[1]It is recognized that videotape does not provide immediate feedback, literally, because the tape must be rewound before it can be played back. It is immediate in the sense that it can be replayed within a period of seconds.

as compared to the feedback of other audio-visual equipment. (2) The equipment records in "natural settings," in normal room lighting, through clear glass, and through one-way mirrors. (3) The videotape recording can be played back at normal speed, slow speed (without audio), in reverse, and with stop frame. By using a counter, specific events on the tape can be located easily without necessitating the replay of the entire tape. (4) The tapes can easily be erased and a tape can be reused up to two hundred times.

Other advantages of videotape recording equipment as compared to other audio-visual devices, include the reasonable expense, ease of operation and the relative ease of equipment mobility, particularly the portable units. Another possible advantage is that the videotape utilizes the therapy time more efficiently by allowing the therapist to assist other clients while the aphasic works with the videotape recording. The possible uses for this new equipment require experimentation and research to evaluate its therapeutic effectiveness.

The Purpose of the Study

It was the purpose of this study to provide some objective information about the effectiveness of three stimulus presentation methods in eliciting responses from aphasic subjects. The study sought to determine whether

any one of the three presentation methods, picture, object or videotape, would be more effective in eliciting correct responses on two specific tasks, naming stimuli and providing a verbal description of the function of the stimuli.

Review of the Literature

Audio-visual equipment provides multi-modality stimulation for the client, which is particularly desirable for aphasia therapy. However, audio-visual devices were impractical and cumbersome for therapy until the advent of videotape recording. Because videotape recording is a comparatively new technique (first reported in the late 1950's), little research has been undertaken to explore its therapeutic applications. Most of the research with videotape has been undertaken by the education profession to evaluate the effectiveness of lesson material presented via videotape as opposed to live teacher performance (1,4,5,13,14,18).

Psychologists have also explored the implications of videotape in evaluating counseling effectiveness and in evaluating the student's performance in counseling situations. The Nebraska Psychiatric Institute (29) has been experimenting with a closed circuit television and a videotape unit primarily for counseling demonstrations for students and to assist in the diagnostic procedures. Diedrich (11) reports the exploration of various personality

malfunctions with the use of videotape. Kagan (20) is currently exploring the effectiveness of videotape as a device in the counseling sessions as compared with the more traditional counseling methods, and the effect videotape has on the learning habits of freshmen. In the area of drama, a pilot study by Anderson (3) evaluated the effectiveness of the videotaped rehearsals in the improvement of actor-director communications.

Research on audio-visual techniques in the area of speech pathology and audiology has been limited. Duffy (12) has experimented with a lip synchronized sound motion picture film to determine a new speech perception index. Irwin and Krafchick (19) experimented with audio-visual film, used by researchers and clinicians, to determine the reliability of audio-visual judgments of misarticulations in children's speech. Cross (10) summarized the history of television with the deaf and hard of hearing. Television was used for lipreading instruction via closed circuit and local broadcasting stations. Scher (24) reports that a split screen was employed to allow the regular program to be seen along with the interpretation in manual language by a signer in the corner of the screen.

Diedrich (11) reports that experimentation has begun in the employment of videotape in the following areas: (1) to evaluate students during their practicum training, (2) parent counseling, (3) for a programmed "training

manual," and (4) for demonstration therapy and for lectures. Buckland (9) experimented in the public schools with videotape as a therapeutic device for articulation therapy and found that the children could locate the articulation errors much more accurately via videotape than when only a mirror was used.

Some audio-visual techniques have been researched in aphasia therapy. Wepman and Morency (32) developed filmstrips for aphasia therapy based upon the observations during the initial evaluation of the aphasic clients. They found an increase in the interest and in the responses given by the aphasic on the visual modality portion of the Language Modalities Test for Aphasia (15) which requires a filmstrip presentation. In this study, the subjects worked alone with the filmstrip and the session was tape recorded. It was found that the aphasics, particularly those who did poorly in face-to-face situations of stimulus-response, had more language with the filmstrip presentations. The improvement was attributed to the decrease in communicative stress because the responses were directed toward the machine rather than toward a therapist. It was also observed that the subjects could advance at their own rate with less pressure for an immediate response and that the subjects were fatigued less easily. Wepman and Morency stated that these brain-damaged subjects were able to handle the stimuli presented to them through filmstrips

more effectively than the stimuli presented through traditional picture card techniques (32).

Keenan (21) developed a programmed series for the language master based on Moore and Schuell's (22) language stimulation cards. The cards can be designed to provide the stimulation necessary for each client, employing a combination of pictures, spoken word and printed word. This particular method is one of the few used in aphasia therapy that employs the principle of a multi-sensory approach for the relearning process.

Videotape recording is currently being employed with aphasics in a variety of ways. Buck (8) employs videotape in the rehabilitation process primarily for consultation and demonstration with and for the family. Buck suggests that the aphasic will facile more language if he is stimulated with familiar surroundings. An apartment-like room is employed in the therapy sessions to supply opportunity for the therapy to center around items found in their familiar places and the necessary objects he needs at home. All of the stimuli are as similar as possible to the client's individual surroundings. This principle can readily be applied to videotape in that representation of the client's environment can be taped and used in therapy.

The use of videotape in direct therapy with aphasics has been studied by Hoops and Ralnick (16) who have

experimented with aphasic patients' descriptions of their language impairments in response to questioning during videotaped interviews. The comments from these interviews were grouped to show the aphasic patients' reaction in the problem areas of verbal comprehension, oral expression, reading, writing and personal reactions to the problems of the aphasic condition. The authors concluded that the "individual with aphasia has the ability to describe and analyze his difficulties, and that these descriptions of the impaired abilities point out a means of gaining insight into the underlying dynamics of the disorder which is helpful to patient and clinician." Because of this the monitoring of the videotape recording with aphasic patients could be a very useful therapeutic method. Videotape has been employed in much the same way in group therapy sessions at Western Michigan University (34).

Summary of Limitations of the Related Studies

A review of the research on the use of audio-visual techniques with the disorder of aphasia indicates a limited number of studies. Prior to the advent of videotape, the use of audio-visual devices with speech pathology and audiology was limited by expense and impracticability. However, videotape has alleviated many of these problems and it is now expedient that experimentation be undertaken to analyze the therapeutic effectiveness of videotape with

speech and language disorders.

As Schuell and others (25,7,31) have indicated, a multi-sensory approach is a necessity in providing adequate and appropriate stimulation for aphasic clients. Audio-visual devices, such as the language master and filmstrips (21,32) have proven to be effective in aphasia therapy. Videotape, however, has several advantages over these methods; it is more practical, and more adaptable to each client's needs (11). In addition, videotape provides opportunities not only for a multi-sensory approach, but just as importantly, an opportunity to provide therapy materials that are identical to those found in the client's environment, such as his own home, family, yard, and other familiar settings. Although pictures and photographs could be employed in the same way, these particular devices lack the action and temporal sequencing that videotape provides. All of these factors are important to provide effective stimulation to assist the aphasic in word finding.

Because of the lack of experimentation with videotape and aphasia, this study was designed to compare the effectiveness of pictures, objects and videotape in eliciting correct responses on naming tasks and tasks involving the description of the functions.

Statement of the Problem

This study was designed to compare three therapeutic

techniques used with aphasia. Two are traditional methods - pictures and objects - and a third new method of videotape. More specifically, this study was designed to compare the number of correct responses elicited from aphasic subjects by each of the three methods in (1) naming the stimuli and (2) description of their function. Specifically, the following questions were asked:

1. Does the frequency of correct responses in a naming task differ among the three presentation methods?
2. Does the frequency of correct responses in a task requiring the description of function differ among the three presentation methods?
3. Are there any differences in the subjects' ability to name objects and describe the function when the same method of stimulus presentation is employed?
4. Is the intra-subject variability among the three methods of stimulus presentation related to the degree of proficiency demonstrated on either the naming task or the task requiring the description of the function?

CHAPTER II

SUBJECTS AND PROCEDURES OF THE STUDY

The purpose of this chapter is to describe 1) the subjects who participated in this study, 2) the materials and equipment used in the study, 3) the procedures employed for each stimulus presentation, 4) the procedure employed to determine the reliability of the examiner's judgments of the subjects' responses and 5) the treatment of the data.

The Subjects

The subjects were eighteen aphasic patients, ten men and eight women, drawn from two hospitals and two speech and hearing clinics in southwestern Michigan. They ranged in age from 23 to 80 years with a median and mean age of 52 years.

The aphasic condition was attributed to a cerebral-vascular accident for 11 subjects, physical trauma for three subjects, surgical intervention for one subject, chronic brain syndrome (associated with excessive alcohol) for two subjects, and a tumor for one subject. The interval between the onset of aphasia and the initiation of therapy had ranged from one month to one year with a median

of six months and a mean of five months. All subjects had received therapy; the period of therapy ranged from one month to three years, with a median of six months and a mean of nine months. All of the subjects had a seventh grade education or better. None of the subjects had been exposed to videotape therapy and all had been exposed to therapy employing pictures and objects. (See Appendix A.)

In order to qualify, the subjects had to identify or describe the function correctly of at least three of the 120 test stimuli. The subjects were randomly divided into six groups of three subjects each. The methods of presentation were counter-balanced for each of the six groups. The following order of presentation was used for each group of subjects:

Group 1 picture, object, videotape
Group 2 object, videotape, picture
Group 3 videotape, picture, object
Group 4 object, picture, videotape
Group 5 videotape, object, picture
Group 6 picture, videotape, object

The Materials and Equipment

The stimulus materials selected for the experiment were articles that could be presented live (objects), by picture and by videotape and which could be demonstrated with some action involved. In addition, all items had to

be relatively common and easily identified. Some of the items were selected because of an auditory component inherent in the demonstration of the function. Another consideration in the selection demanded the employment of traditional aphasia therapy materials.

Based on the above criteria, the 20 articles listed below were selected as stimuli for the experiment.

ashtray	newspaper
book	pen
cigarette	pencil
clock	radio
comb	soap
cup	telephone
door	television
glass	toaster
key	toothbrush
matches	towel

All of the stimulus words were nouns. All the words were names of common articles usually found in the home and the function of each could be demonstrated. There were nine one-syllable words, six two-syllable words, four three-syllable words and one four-syllable word. According to Thorndike (28), ten of the words[1] appear over 50 times in every million words (equivalent to the third grade vocabulary) and all the rest except "toothbrush," "television" and "toaster" appear over 20 times per every million words (equivalent to the sixth grade vocabulary).

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[1]

book	key
clock	matches
cup	newspaper
door	pen
glass	telephone

"Television" and "toaster" would probably appear more frequently today. Seven of the articles, "clock," "door," "key," "radio," "telephone," "television," and "toaster" had some associated, distinct auditory feature that appeared during the demonstration of the function. The remaining 13 articles did not have an associated auditory feature. All of the words appeared in the Taylor Aphasia Kit (27) to further insure that the stimulus words were those found in traditional aphasia therapy.

The pictures from the Taylor Aphasia Kit are black, India ink drawings of specific items on eight and one-half inch by eight and one-half inch white, cardboard squares.

The objects used in the experiment were chosen on the basis of their likeness to those pictured in the Taylor Aphasia Kit. For example, in the Taylor Kit, the radio was a table model, with the selector dial in the right corner and the volume dial in the left. The face was a lighter colored grill work and the rest of the radio was a darker color. Finally, the objects described above were used in the production of a videotape. The objects and a demonstration of their function were recorded on an Ampex 7000 Videocron Recorder. The following is a description of the demonstrated functions for each object.

pen	Examiner (E.) picks up pen, removes the cap, and writes a few words.
newspaper	E. picks up the paper, scans first page and turns the page and scans it.

cup	E. picks up the cup and drinks.
toothbrush	E. picks up the brush and brushes teeth.
book	E. picks up book, opens to middle and scans it, turns page and scans it.
door	E. walks over to closed door, opens it, walks through and shuts it.
glass	E. picks up glass and drinks.
key	E. has lock in hand, picks up key from table, unlocks lock, removes the opened lock and leaves the key on the table.
clock	The alarm is ringing, E. turns it off and compares time with watch.
towel	E. takes towel from wall hook, dries hands.
television	E. turns TV on, switches channels, ending with the original station.
cigarette	E. picks up the cigarette from the ashtray, takes one smoke.
telephone	Phone rings two times, E. picks up phone and says hello.
radio	E. turns dial on, adjusts the volume, then adjusts selector dial, lets it play.
soap	E. picks up soap, removes wrapper, rubs soap on hands, sets soap down, rubs hands.
pencil	E. picks up pencil, writes a few words.
matches	E. picks up match laying in front of the box, shuts the box and strikes the match, holds burning match then blows it out.
comb	E. picks up comb and combs his hair.
ashtray	E. puts out a cigarette butt, leaves it in ashtray.
toaster	Toast is already in toaster, E. pushes lever down, time lapse of three seconds, E. raises the lever and toast pops up.

The Procedures

Each subject was required to attend one experimental session. The subject was given an explanation of the testing procedures and a trial period. To make the experimental procedure identical for each presentation, the subject was required to name the stimuli and describe their function.

The order of the stimuli was randomly selected for each presentation method. This order was maintained across the methods because the videotape recorded presentation could not be randomized for each subject. Each stimulus method occurred first, second and third and an equal number of times. For each experimental test the following instructions were read to each subject:

> Listen carefully. I will show you a(n) picture, object or videotape. (Only one was named.) Look at it carefully. Then I will take it away. (This sentence was omitted for videotape presentations.) I will ask you two questions about the picture, object or videotape. First I will ask what it was. Then I will ask what it is used for. Do you have any questions, if not, we will begin.

The actual questions asked were: What was that?

What do you do with that?

The range of stimulus presentation time was ten seconds to 20 seconds in length. The mean time was 14.5 seconds in length. Between each presentation, there was

an interval for stopping the recorder to obtain the responses. Based on the mean time of presentation of the videotaped stimuli, the picture and object stimuli were presented for a period of 15 seconds exposure.

At this point, a practice trial was run for each method of presentation to permit the subject to become acquainted with the procedure. To begin the trial, the examiner said, "We are going to practice on a picture (object or videotape recording) to make sure you understand what I want you to do." The subjects were allowed a maximum period of 15 seconds to respond. At the end of the trial, the examiner would say, "Do you have any questions, if not, we are ready to begin." If the subject did not understand or performed the task incorrectly, the directions were repeated. If the subject still did not perform adequately, the examiner would say, "Listen again. I will show you what I want. What was that? That was a fork. What do you do with it? You eat with it. Now you try." At this point, the examiner repeated the presentation procedure. If the subject still responded inappropriately, the subject was excluded from the study. Two prospective subjects were excluded from the study because they failed to respond to any of the trial stimuli.

After completion of the first experimental test, there was a five minute break to allow the subject to rest and to allow the examiner time to arrange the next test

stimuli. After the break, the same directions were read and the same procedure followed. The same procedure was employed for the third and last experimental test.

The subjects' responses for each experimental test were recorded in writing by the examiner. The subjects were required to respond aloud to each of the test items. If the response latency was greater than 15 seconds or if the response was judged to be significantly deviant from the acceptable utterance of the word, the response was scored as incorrect. If the response was unintelligible or if the response contained sound substitutions that constituted another word, the response was judged to be unacceptable. If the sound substitutions did not form another word, the response was scored as correct. For the responses that described the function of the stimuli, the response was scored correct if it included an appropriate verb. If the response contained sound substitutions that did not form other words, it was scored as acceptable. The response was scored as incorrect if it was unintelligible, contained an inappropriate verb, or if the sound substitutions formed other inappropriate words.

The Reliability of Judgments

To determine the experimenter's reliability, the experimenter listened to the taped responses of 12 of the 18 subjects one week after the final subject was tested.

Of the 240 responses considered in the naming task, only one response was judged to be different on the tape as compared with the judgment made during the experimental session. Of the 240 responses considered in the description of function task, none of the responses were judged to be different on the taped samples when compared to the judgments made during the experimental session. Because these comparisons revealed practically no discrepancy, the reliability was judged to be sufficiently high to consider the judgments dependable.

The Treatment of the Data

The subjects' responses were judged and tabulated. Arithmetic mean and median values were determined for correct responses to each of the three methods of stimulus presentation on each of the two tasks. Analyses of variance were performed on the group data to study the relative effectiveness of the three methods of stimulus presentation employed.

t tests were performed to determine whether there were any differences in the subjects' ability to name and describe the function when the same method of stimulus presentation is employed.

Finally, correlation coefficients were computed to study the relationship between the degree of proficiency and the performance on each of the three methods of presentation.

CHAPTER III

THE RESULTS AND DISCUSSION OF THE STUDY

The purpose of this chapter is to report and discuss the results of this study. Appendices B and C contain the raw data for each method of stimulus presentation on each task. It is with these data that the analyses of variance, *t* tests, and correlation coefficients in this study were based.

Question Number 1

Question number one was concerned with whether the frequency of correct responses in a naming task differed among the three presentation methods. Table I presents the mean and median values for each of the presentation methods for the naming task. In order to determine whether differences among these means exists, an analysis of variance was performed. The results of this analysis are presented in Table II. As can be seen from this table, the differences among the mean performances of the subjects on each of the three methods of stimulus presentation were not significant at the .05 level of confidence.

The mean number of correct responses for the task involving naming of the stimuli was determined for each of

TABLE I. MEAN AND MEDIAN VALUES AND THE STANDARD DEVIATIONS OF THE THREE METHODS OF STIMULUS PRESENTATION ON THE NAMING TASK

Method	Mean	Median	s.d.
Picture	14.8	17.5	5.76
Object	14.6	19	6.40
Videotape	14.3	18	6.03

TABLE II. SUMMARY OF THE ANALYSIS OF VARIANCE OF THE THREE METHODS OF STIMULUS PRESENTATION ON THE NAMING TASK

Source	df	SS	MS	F*
Treatments	2	2.33	1.17	.564
Subjects	17	1808.17	106.36	
Treatments X Subjects	34	70.33	2.07	
Total	55	1880.83		

*$F_{.05\ (df = 2,34)} = 3.32$

the three methods of stimulus presentation, as shown in Table I. In response to pictures, the number of correct identifications ranged from 0 to 20, with a mean of 14.8 and a median of 17.5. The number of correct identifications in response to the objects, ranged from 1 to 20, with a mean of 14.6 and a median of 19. In response to the videotape, the number of correct identifications ranged from 0 to 20, with a mean of 14.3 and a median of 18.

Although there is a wide variance in the range of scores, only three subjects scored below ten on the picture method, five on the object method and three on the videotape method. (See Appendix B.) The analysis of variance relative to these three methods produced an F value of .564, as shown on Table II. As stated before, this ratio is not statistically significant at the .05 level of confidence.

Question Number 2

Question number two was concerned with whether the frequency of correct responses in a task requiring the description of function differed among the three methods of presentation. Table III presents the mean and median values for each of the presentation methods for the task requiring the description of function. In order to determine whether differences among these means exists an analysis of variance was performed. The results of this

TABLE III. MEAN AND MEDIAN VALUES AND THE STANDARD DEVIATIONS OF THE THREE METHODS OF STIMULUS PRESENTATION ON THE TASK REQUIRING THE DESCRIPTION OF FUNCTION

Method	Mean	Median	s.d.
Picture	12.5	13.8	6.55
Object	13.8	18.5	7.01
Videotape	13.5	17	6.61

analysis are presented in Table IV. In this table, the differences found among the performance of the subjects on any one of the three methods of stimulus presentation were statistically significant at the .05 level of confidence.

The mean number of correct responses for the task involving the description of the function of the stimuli was determined for each of the three methods of stimulus presentation, as shown in Table III. When presented with pictures, the number of correct responses ranged from 1 to 20, with a mean of 12.5 and a median of 14.5. The number of correct responses when presented with objects, ranged from 0 to 20, with a mean of 13.8 and a median of 18.5. When presented with videotape, the number of correct responses ranged from 0 to 20, with a mean of 13.5 and a median of 17. Although there is a wide variance in the range of scores, only five of the subjects scored below ten with the picture method, five with the object method, and four with the videotape method. (See Appendix C.) The analysis of variance relative to these three methods produced an F value of 4.520, as shown on Table IV. As previously stated, this ratio is significant at the .05 level of confidence.

Because the F value was found to be significant at the .05 level of confidence, t tests were computed on the pairs of means. The results of these t tests are presented in Table V. This table indicates that the differences in

TABLE IV. SUMMARY OF ANALYSIS OF VARIANCE OF THE THREE METHODS OF STIMULUS PRESENTATION ON THE TASK REQUIRING THE DESCRIPTION OF FUNCTION

Source	df	SS	MS	F*
Treatments	2	18.48	9.24	4.520*
Subjects	17	2237.26	131.60	
Treatments X Subjects	34	69.52	2.04	
Total	53	2325.26		

*$F_{.05\ (df = 2,34)} = 3.32$

TABLE V. MEAN VALUES OF THE SUBJECTS' PERFORMANCE BETWEEN METHODS OF PRESENTATION FOR THE TASK REQUIRING THE DESCRIPTION OF FUNCTION

Method	Mean	t
Picture	12.5	
Object	13.8	2.06*
Videotape	13.5	1.48
		.58

*$t_{(34\ df)\ (.05)} = 2.031$

subject performance between the picture and object presentation methods yielded a *t* value of 2.06 which is significant at the .05 level of confidence. The differences between picture and videotape methods and between the object and videotape methods yielded *t* values of 1.48 and .58, respectively, neither of which are significant at the .05 level of confidence.

Question Number 3

Question number three concerned the differences in the subjects' ability to name and describe the function when the same method of stimulus presentation was employed. In order to test the significance of the differences between means, *t* tests were performed. The results of these *t* tests are presented in Table VI.

As can be seen from this table, the differences between the performances of the subjects with the picture method yielded a *t* value of 2.8 which is significant at the .01 level of confidence. The object and videotape presentation methods yielded *t* values of .90 and .99 respectively, neither of which are significant at the .05 level of confidence. Figure I graphically presents the means values for the two tasks.

Question Number 4

TABLE VI. MEAN VALUES OF THE SUBJECTS' PERFORMANCE FOR EACH TASK WITH EACH METHOD OF PRESENTATION

Method	Naming	Function	t
Picture	14.8	12.5	2.8*
Object	14.6	13.8	.90
Videotape	14.3	13.5	.99

*$t_{(35\ df)\ (.01)} = 2.723$

FIGURE I. MEAN VALUES OF THE NUMBER OF CORRECT RESPONSES ON THE NAMING TASK AND THE TASK INVOLVING THE DESCRIPTION OF FUNCTION FOR THREE METHODS OF STIMULUS PRESENTATION

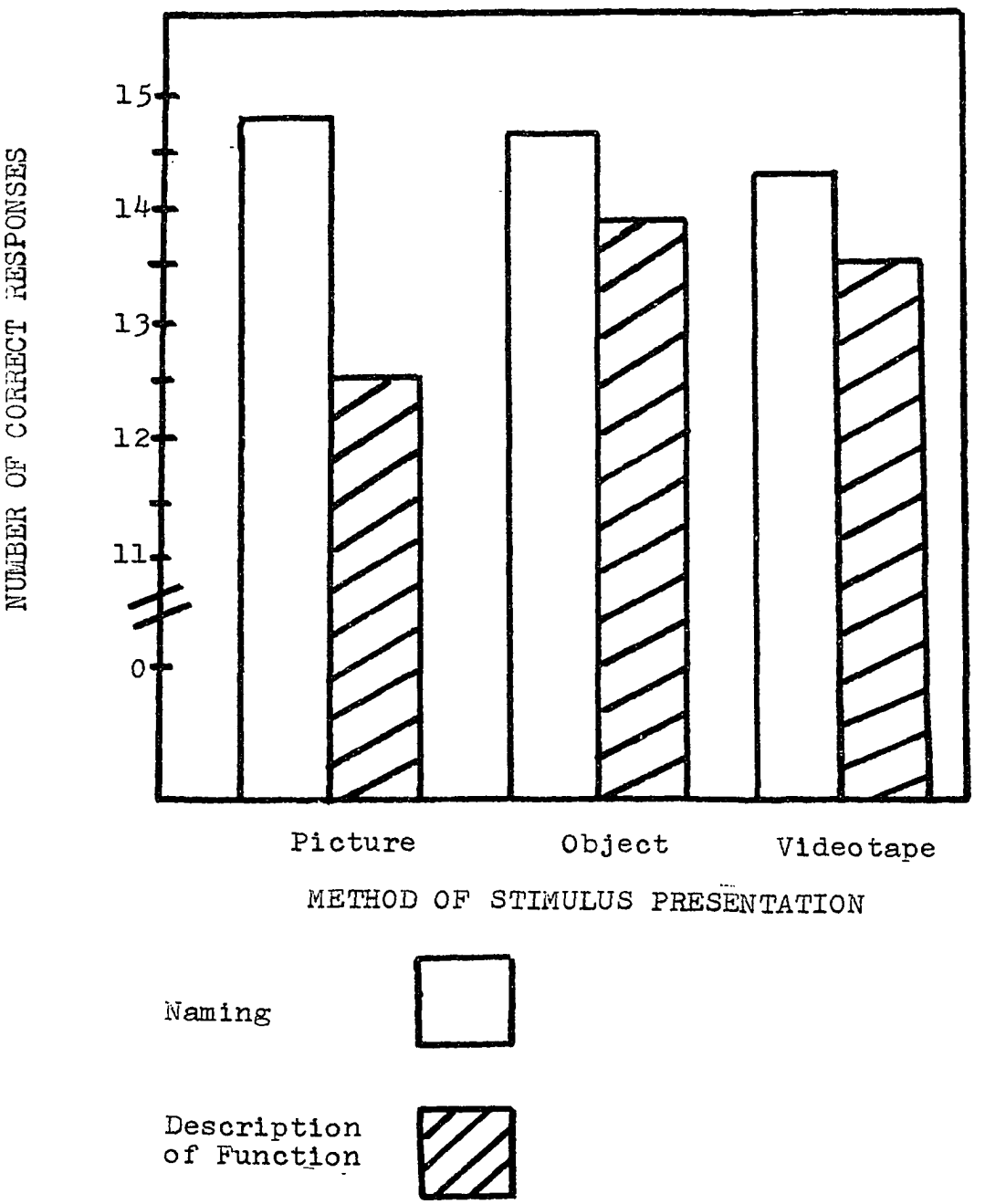

TABLE VII. CORRELATION VALUES OF SUBJECT PERFORMANCE OF THREE METHODS OF STIMULUS PRESENTATION ON THE NAMING TASK AND THE TASK REQUIRING THE DESCRIPTION OF THE FUNCTION

Methods	r	
	Naming	Description of Function
Picture vs. Object	.95*	.95*
Object vs. Videotape	.95*	.97*
Picture vs. Videotape	.95*	.94*

$r_{(34\ df)\ (.01)} = .418$

of variance failed to show that any one method is superior. There is an implication that the three methods may be equally effective. Because of this implication of the effectiveness of the methods, it is important to consider the advantages of each.

Pictures are easily obtained, easily handled and are very portable. Pictures or snapshots can represent any situation or object that is appropriate or important for the aphasic's therapy program. Nevertheless, pictures cannot include multi-sensory stimulation, particularly tactile and auditory cues. Pictures are limited in the amount of environmental cues that can be viewed at one time. For example, only one portion of a room can be pictured at a time.

Objects, on the other hand, provide the aphasic with multi-sensory stimulation, the patient can see, hear, feel, and manipulate many objects. With this amount of information, the aphasic has more opportunity to find the necessary words. Objects are limited therapeutically in that most items are not easily accessible for therapy. Small household items usually employed at the beginning of therapy can be supplied readily. It is also recognized that models of homes, furniture, dishes, and other items can be employed in therapy and many times more feasibly than the real objects. However, the models contain subtle reminders of children's toys which could easily stimulate

negative feelings in the aphasic. Although the models do provide likenesses, they are an inappropriate size scale which may inhibit the aphasic's ability to supply the necessary words. In addition, as therapy progresses and the client's needs expand to his environment, family and other situations, these items and settings cannot be supplied in therapy through the use of objects.

Videotape, unlike pictures and objects, provides opportunity for the demonstration of various objects as well as environmental situations and other settings. Unlike pictures, a videotape can allow for viewing a particular room from wall to wall etc., as one could when entering the room or from a specific chair. Although videotape cannot provide the tactile stimulation as objects can, it does present objects and people in their appropriate settings and in proportionate size. This according to Williams and Gassel (33) should trigger more appropriate responses. Videotape includes auditory features of the environment and specific objects that can be used for stimulation. In viewing videotape, the aphasic would be stimulated by an actual representation of the object in normal proportionate size for the setting, actual movement including the temporal sequencing of events and any auditory features that are present. With this amount of information, the aphasic would have more opportunity to find the appropriate words. In addition to this, videotape

possesses one characteristic that neither of the other two methods can claim. With videotape, stimulus exposure time can be predetermined and preset. This is an important advantage for research and therapy. To control exposure time with precision using objects and pictures would be difficult without the assistance of elaborate, mechanized devices.

Although the control of exposure time is an advantage of videotape, the time factor also contains a weakness. When considering the latency of response that most aphasics exhibit, videotaped stimuli could provide a difficult situation for the aphasic. The stimulus is there for only a specific amount of time and then it is gone. Whereas, objects and pictures can be left in front of the aphasic until he can approximate the language he wants. This limitation of videotape can be diminished somewhat by the stop-frame technique. However, the stop-frame merely stops at a specific point in the presentation and does not include movement, sound or other essential features.

Other weaknesses involve limitations while making the tapes for stimulation. It is often difficult to transport the equipment (camera, recorder, lighting, microphone) and record in all settings. For example, there must be an electrical output capable of providing enough current to support all of the equipment. In addition, for good results, it is necessary to have at least two people

involved while making the recording, one to operate the camera and record while the other performs the stimulus task. Although an amateur could perform the camera duties, more suitable results are achieved when the cameraman has had experience with videotape recording.

Another weakness is that some models of videotape equipment are very cumbersome and difficult to move. The recorder and camera are fragile and can easily be broken. Furthermore, the videotape equipment is relatively expensive to replace.

Question Number 2

Question number two is closely related to question number one. However, it is also of interest to the aphasia therapist to elicit responses which concern a description of function of various items. Question number two was concerned with whether the frequency of correct responses in a task requiring the description of function differed among the three presentation methods. The analysis of variance shows that there is a significant difference among the methods used in the presentation. (See Table IV.) In analyzing that significant difference, the *t* test shows that there is a significant difference in the number of correct responses elicited between the picture and object presentation methods. (See Table V.) No significant difference was observed between either the picture and the

videotape methods or the object and videotape methods.

On this task, the results clearly indicate that live objects elicit more correct responses than still pictures. The results also show that pictures and videotape or objects and videotape are equally effective in eliciting correct responses on description of function tasks. The results of this analysis may be due to the fact that objects more clearly reflect the function of the stimuli. Pictures are limited in their ability to demonstrate the function because they can provide, at best, a series of various movements on separate drawings or cards. Videotape, on the other hand, while providing for action and movement lends artificiality to the task presented and possibly could distort it. For example, the size of the objects or settings demonstrated cannot always be represented as life size, whereas the live object was always presented in life size. These factors could certainly influence the aphasic client's ability to find the appropriate words.

Another factor to be considered is that videotape represents a combination of both picture and object characteristics. Videotape is a two-dimensional picture (and can only be presented in black and white) and yet it is capable of providing motion and auditory cues like the live objects. These factors could also partially account for the results of the study.

Question Number 3

Question number three was concerned with whether there were any differences in the subject's ability to name and describe the function when the same method of stimulus presentation was employed. The *t* tests (See Table VI.) show that there are no significant differences in the subjects' ability to name the object and to describe its function when object or videotape stimulation are employed. The *t* tests show that a significant difference does exist in the subjects' ability to name the item and describe its function when the picture method of stimulation is employed. The implications of these results suggest that on a naming task, none of the three methods is better than any of the other methods. However, when the aphasic is required to supply words describing function involving some type of action, the picture method will elicit fewer correct responses. It would appear that when the subject was not able to view the function demonstrated and was not supplied with innate auditory cues, he was less able to find words to describe the function. For therapy purposes, when the aphasic is required to perform tasks that require description of function, pictures do not provide the extra information needed and may in fact inhibit the aphasic from finding words for the task.

Another observation was that more correct responses

were elicited on all three methods for the naming task than on the task requiring the description of function. (See Figure I.) This is particularly noteworthy since according to many authorities, word finding and specifically naming, constitutes one of the more prominent difficulties (7,25,31). It is possible that the results of the study were influenced by the length of therapy exposure for the subjects and by the activities encountered during this period. Another explanation could be that the stimuli chosen for the study were words the subjects frequently encounter; consequently naming these items might represent an easier task.

Schuell, et. al., (25) state, "There is a negative correlation between errors on word finding tests and the frequency with which words are used in the language and their utility to the patient. This is to say, the more common a word is, the fewer errors aphasics tend to make using it in naming, pointing, reading or writing and the converse is true."

Question Number 4

Question number four concerned the degree on intra-subject variability among the three methods of stimulus presentation. The three methods were investigated to determine whether or not the degree of proficiency for the subjects was consistent. The correlation coefficients

indicate that there is a high degree of intra-subject consistency. (See Table VII.) The implications of these findings suggest that regardless of the subject's proficiency each of the three methods will be equally effective. Although none of the three methods are superior, the implications are that videotape will probably be about as effective as the two more traditional approaches in eliciting correct responses from the aphasics.

CHAPTER IV

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The purpose of the study was to determine whether any one of the three presentation methods, picture, object or videotape, would be differentially effective in eliciting correct responses from aphasic subjects on two specific tasks: 1) naming, and 2) describing the function of selected stimuli.

Eighteen subjects were randomly divided into six groups of three subjects each, determined by the order and sequence of the methods of stimulus presentation. The examiner administered the appropriate instructions and presented the three methods of stimulation to each subject. The responses to the stimuli on each task were recorded by the examiner and judged for correctness by a predetermined criteria. The subjects' responses were tabulated and analyses of variance, t-tests and correlations were performed.

The results of the study indicate that each of the three methods will elicit approximately the same number of correct responses from aphasics on the naming task. For the naming task, any one of the three methods can be

employed equally effectively. However on the task requiring the description of function, there was a significant difference in the amount of correct responses elicited by objects as compared to pictures. No significant differences were observed between the number of correct responses elicited between object and videotape and picture and videotape methods of presentation. The results also indicate that a significant difference exists in the aphasics' ability to name and describe function when presented with pictures; this difference was not observed on the tests involving objects or videotape. Furthermore, neither subjects who did well on the tasks nor the subjects who performed poorly varied significantly from one stimulus method to another.

Conclusions

There are several implications for aphasia therapy that can be derived from this study. During therapy, it is recommended that each of the three methods be employed jointly for effective stimulation. The methods of stimulation employed should be modified to provide the necessary stimulation for the individual aphasic enabling him to attain maximum results. The method or methods of stimulation employed should be appropriate to the task and should be modified to suit the individual patient's ability, disability and therapeutic goals.

During the initial stages of therapy, it may be more effective to employ pictures for beginning naming activities. Pictures are easily manipulated and readily available for such tasks. However, as the aphasic's need for more advanced language increases, objects appear to be preferable to pictures. There was no significant increase or decrease when videotape was employed. To supply adequate stimulation for the client, the therapist must evaluate the type of stimulus necessary for the task and adapt the method most applicable and practical for the situation.

Recommendations

Future research is demanded and might benefit from the following suggestions. This study was designed to compare the effectiveness of pictures, objects and videotape in eliciting correct responses from aphasics on naming tasks and tasks requiring the description of function. Based on the results of this study, it is now advisable that each of the three methods be explored further. If this study is duplicated, it is suggested that there be a greater control on the therapy methods to which each subject had been exposed. There may be significant differences between the subjects' ability to perform the tasks based on the methods of therapy received. It is suggested that future research control the influence of the specific sensory modalities involved with each presentation method.

Another aspect that needs exploration is the effect the auditory components have on the number of correct responses elicited. It would be interesting to determine the response latency involved with each task, to consider not only if a correct response was achieved but also the time necessary to produce a correct response.

Comparisons could also be made of the effectiveness of these methods on learning tasks using normal subjects. If a group of relatively homogeneous aphasics could be obtained, it would be interesting to chart the therapeutic progress of each when stimulated by only one of the three methods or by various combinations of the methods.

APPENDIX A

DESCRIPTION OF INDIVIDUAL SUBJECTS

Subject	Sex	Age	Etiology	Interval Between Onset & Therapy	Duration of Speech Therapy	Education	Occupation
1	M	57	CVA	1 mo.	1 mo.	12th (grade)	Salesman
2	M	23	accident	6 mo.	3 yrs.	12th	Truckdriver
3	F	32	Surgical Intervention	6 mo.	3 mo.	M.A.	Teacher
4	M	57	CVA	1 yr.	1 1/2 yrs.	12th	Supervisor, Machinist
5	F	60	CVA	6 mo.	6 mo.	B.A.	Teacher
6	F	71	CVA	1 mo.	1 mo.	12th	Housewife
7	F	50	CVA	1 mo.	1 yr.	12th	Secretary
8	M	57	Brain Tumor	1 yr.	1 mo.	7th	Foundry Worker
9	M	23	Accident	6 mo.	1 1/2 yrs.	12th	Student

Subject	Sex	Age	Etiology	Interval Between Onset & Therapy	Duration of Speech Therapy	Education Level	Occupation
10	F	66	CVA	6 mo.	1 mo.	9th	Housewife
11	F	77	CVA	1 mo.	3 mo.	11th	Housewife
12	M	52	CVA	1 mo.	1 mo.	11th	Tool & Dye Maker
13	F	71	CVA	3 mo.	1 yr.	12th	Nurse's Aid
14	M	45	CBS*	6 mo.	1 yr.	11th	Laborer
15	M	50	CBS	1 mo.	6 mo.	12th	Laborer
16	M	45	Accident	1 yr.	6 mo.	12th	Boiler Maker
17	F	52	CVA	6 mo.	1 yr.	12th	Housewife
18	M	37	CVA	3 mo.	1 yr.	1 yr. coll.	Laborer

*Chronic Brain Syndrome

APPENDIX B

NUMBER OF CORRECT RESPONSES FOR EACH SUBJECT ON THE NAMING TASK.

Subject	Picture	Object	Videotape
1	0	1	1
2	19	20	20
3	20	20	20
4	17	20	18
5	12	6	11
6	8	6	6
7	19	20	19
8	15	11	12
9	20	20	17
10	14	14	10
11	15	17	18
12	5	6	4
13	10	9	10
14	19	19	16
15	17	17	19
16	20	20	19
17	18	19	19
18	19	19	19
Total	267	264	258
Average	14.8	14.6	14.3

APPENDIX C

NUMBER OF CORRECT RESPONSES FOR EACH SUBJECT ON THE TASK INVOLVING THE DESCRIPTION OF FUNCTION.

Subject	Picture	Object	Videotape
1	1	0	0
2	18	19	20
3	20	20	20
4	14	20	17
5	9	12	11
6	2	4	6
7	14	18	15
8	6	7	10
9	19	19	16
10	11	11	10
11	18	19	19
12	1	2	1
13	8	6	6
14	19	19	17
15	15	18	18
16	17	18	18
17	19	19	20
18	14	19	19
Total	225	250	243
Average	12.5	13.8	13.5

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