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ABSTRACT

THE EFFECT OF INFORMATION AND AUGMENTATIVE COMMUNICATION TECHNIQUE ON ATTITUDES TOWARD NON-SPEAKING INDIVIDUALS

By

Carole Wood Gorenflo

The present study investigated the effect of printed information and three augmentative communication techniques on attitudes of able-bodied individuals toward physically disabled, non-speaking individuals. Subjects viewed a videotape depicting a non-speaking adult having a conversation with a normal speaking individual. The three communication techniques depicted were: 1) unaided, 2) non-electronic alphabet letter board, and 3) computer-based voice output communication aid (VOCA). In addition, factual information about the non-speaking person was provided to half the subjects. The reliability and validity of a scale assessing attitudes toward non-speaking persons, the Attitudes Toward Non-Speaking Persons Scale (ATNP), had previously been determined and was employed as the dependent measure. Results revealed that subjects expressed more favorable attitudes when provided with the additional information concerning the non-speaking individual. Attitude favorability also increased with the

sophistication of the communication technique. Additional findings revealed that when the attitude target was just a general evaluation of the non-speaking individual, either the presence of information or the VOCA served to enhance more positive attitudes. However, if the attitude target focused on increasing interaction with non-speaking individuals, only the technological communication technique served to enhance attitude favorability. No interaction was found between information and communication technique. The utility of the ATNP as an assessment device and the implications of these findings for reducing negative attitudes are discussed.

DEDICATION

To my Mother, Katherine Dittrich McMillin, who instilled in me the spirit of imagination, inquisitiveness, and independence.

And to non-speaking individuals everywhere, especially Lindsay, Jim, Phil, Heidi, Dee, Michael, and Shanon who inspire my thoughts.

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CHAPTER I

INTRODUCTION

Attitudes toward disabled persons have been investigated from numerous perspectives during the last thirty-five years. Within this significant body of literature (Barker, Wright, Myerson, & Gonick, 1953, Wright, 1960; Yuker, Block, & Younng, 1966; Siller, Chipman, Ferguson, & Vann, 1967; Siller, 1976a, 1976b, 1984a; Cruickshank, 1980; Jones, 1984) discrepencies in findings exist due to the lack of systematic studies using well developed instrumentation (Siller, 1984b), the use of technically inadequate measures of attitudes, or the absence of established theoretical bases (Towner, 1984).

Two reviews of the literature on attitudes toward the disabled separated by more than twenty years (Barker, Wright, Meyerson, & Gonick, 1953; Siller, 1976) have reached similar conclusions. Attitudes toward disabled persons were varied and frequently negative. Verbalized attitudes were, on the average, mildly favorable. Indirect evidence suggests that unverbalized attitudes were more frequently critical. Society's rejecting attitudes toward the disabled result in restricted social and vocational opportunities for

the disabled. Attitudes toward the disabled are multidimensional and may be affected by the degree and type of handicap. Attempts to modify negative attitudes toward the disabled have been unsuccessful for the most part.

In order to elucidate some of the concerns regarding our conceptual understanding of attitudes toward the disabled, the following review of literature is in four parts. Part one focuses on the foundations of attitude theory, whereas part two is on the development of attitude measures or instruments. Part three concerns correlates of attitudes toward the disabled, and part four addresses the research on attitudes toward speech/communication and hearing impairments. A final section on augmentative communication provides background information on terminology and factors related to the use of augmentative communication systems which are pertinent to the present investigation. This review focuses on literature pertinent to attitude measurement and to those studies which relate generally to the assessment of attitudes toward physically disabled persons and persons with communication impairments.

Foundations of Attitude Theory

Historically, experimental research on attitudes became a focal area of interest during the first few decades of this century. Thurstone and Chave (1929)

observed that the study of the phenomenon (attitudes) required objective and quantitative measurement. They developed a theory of attitude measurement which proposed that subjects' attitudes could be quantified and weighted by the expression of the acceptance or rejection of opinions. Thurstone and Thorndike (1935) were among the first who attempted to develop scientific assessment instruments for measuring attitudes. Allport (1935) called attitude the most important and indispensable concept in contemporary social psychology. He defined an attitude as "a mental and neural state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related" (p. 810). Thus, attitude became the preeminent concept because of the important psychological functions that attitudes were thought to serve and because of the presumed ability of attitudes to direct (and thus allow prediction of) behaviors. Beliefs were thought to be related to behaviors because they contributed to the formation of attitudes.

During the 1960's, attitudes were defined as predispositions to respond in a certain way toward specific subjects (Rosenberg & Hovland, 1960). From this perspective, attitudes are inferential in respect to the way one responds to a particular stimulus.

More recently, the term attitude is referred to as a general and enduring positive or negative feeling about some person, object, or issue (Bem, 1970; Insko & Schopler, 1972; Oskamp, 1977). In addition, the term belief refers to the information that a person has about other people, objects, and issues. This information, in turn, may have either a positive, negative, or no evaluative implication for the target of the information. Behaviors represent the overt actions that might be associated with the target (Petty & Cacioppo, 1981).

Thus, an attitude toward any given object, idea, or person is an enduring construct that seems to have a cognitive component, an affective component and a behavioral tendency. The cognitive component consists of the beliefs about the attitude object; the affective component consists of the emotional feelings connected with the beliefs; and the behavioral tendency is the readiness to respond in a particular way. For example, an individual's attitude toward Robert Redford might include the knowledge that he is a man, blond and blue-eyed, very handsome, an actor and a good skier; feelings of attraction and liking; and the behavioral tendency to see all his movies.

The study of attitudes has not only been of interest to psychologists; educators, anthropologists, and sociologists have investigated attitudes toward

specific groups of people, objects, and issues (Sherif & Cantril, 1947). In recent years, several social science disciplines have developed focal interests in the measurement of attitudes and attitude change toward the disabled (Marinell & DellOrto, 1984). The field of communication disorders has also demonstrated research interests in this topic area in regard to a variety of communication disorders. Considerable theoretical and applied research on attitudes and attitude change has been conducted in the field of special education in recent years as well (Jones, 1984). In order to gain an understanding of attitudes, regardless of discipline, a number of measurement techniques have been developed in order to objectively quantify attitudes.

Measurement of Attitudes

The development and use of a technically adequate instrument to measure attitudes is a major concern of attitude studies. Inherent in this concern is the ability to draw inferences from the data through the use of inferential parametric statistics and to provide reliability and validity information regarding the measure. Early, as well as some contemporary, instruments for measuring attitudes toward the handicapped have lacked sophistication and have presented little or no information about reliability and validity. For example, in the area of communication

disorders, Ashmore (1958) developed a paired-antonyms trait checklist to rate a speaker with a speech impairment. No scale development procedures were reported. More recently, Edelman (1984) developed a 23 item Likert-type questionnaire to assess attitudes regarding the use of a speech aid following a laryngectomy. No reliability or validity data were presented.

An examination of three general types of instruments to measure attitudes of adults reveals certain psychometric strengths and weaknesses. Three general types of attitude measurement instruments are: 1) non-scored instruments (cf. Baskin & Herman, 1951; Rusalem, 1967; Clore & Jeffrey, 1972), 2) simple-scored instruments (cf. Jensen & Kogan, 1962; Daniels, 1976), and 3) attitude scales (cf. Siller & Chipman, 1965; Yuker, Block, & Campbell, 1960; Osgood, Suci, & Tannenbaum, 1957).

Non-scored. Unstructured, non-scored instruments are the simplest method of assessing attitudes. This method may include an unstructured questionnaire or interview. The subjects are asked direct questions about their attitudes. For example, "How do you feel about disabled people?" In most cases the data from unstructured questionnaires are treated only in terms of the frequency of response per item and do not give measures that permit inferential statistical analysis of

overall attitudes.

Structured non-scorable measures are generally 2-point response categories such as "yes-no," "true-false," or "agree-disagree." This nominal data method is also inadequate for inferential statistics.

A ranking procedure is the most sophisiticated of the non-scored techniques. This procedure uses an ordinal scale thus permitting the use of non-parametric statistics. However, limitations on measures of central tendency result, i.e., medians may be computed but not means.

Simple scored. Simple scored instruments differ from the non-scored technique in that weights are assigned to each score, thus permitting better discrimination among respondents on the basis of the total score. For example, a "yes" response might receive a score of 3, whereas a "no" response is assigned a score of 1. The inadequacy of the simple scored instrument is due to the lack of an equal interval unit of measurement such as that used in attitude scaling technique.

Attitude scales. Attitude scaling techniques were first developed in the 1920's and 1930's by Bogardus, Thurstone, and Likert. The first scale was the Bogardus Social Distance Scale in 1925 which was developed in order to evaluate prejudices. Thurstone (1927, 1929)

developed a method for making paired comparisons and the method of equal intervals for scaling and scoring attitude items. In this method a number of opinion statements are constructed. Each statement is assigned a scale value. The attitude score is the median of the scale value of the statement that the person endorses.

Likert (1932) developed a technique similar to the Thurstone procedure in that a large number of opinion statements relevant to the attitude issue are collected. Each statement should clearly express either a positive or negative feeling about the issue. The scale assumes that each of the items measures the same underlying attitude, and any items that do not correlate highly with the total test score are eliminated from the scale. Attitude scores are based on the summated ratings of individual items.

Studies of attitudes toward disabled persons have utilized both Thurstone and Likert-type scaling procedures. Modifications of the Social Distance Scale to measure the degree of social acceptance or rejection of disabled persons was used by Whiteman & Lukoff (1962a) and Siller & Chipman (1965). Siller (1963) developed a Feeling Check List consisting of a 7- point scale to rate how one feels in the presence of a physically handicapped person. Siller & Chipman (1965) developed a General Acceptance (GA-1) measure. The GA-1 focuses on phobic and ambivalent attitudes toward the

disabled and was constructed based on interview and questionnaire data.

Likert-type scales have been widely used to study attitudes toward specific groups of disabled persons such as the blind or those with cerebral palsy (Yuker, Block, & Younng, 1966). Lukoff & Whiteman (1959, 1961) developed the first scale for measuring attitudes toward a specific disability. The Attitudes Toward Blindness Scale (A-B Scale) and the Physically Handicapped (P-H) Scale consisted of Likert items and sentence completion items. The Disability Factor Scale (Siller, Ferguson, Vann, & Holland, 1968; Siller, 1970) was developed to assess the multidimensionality of attitudes toward such specific disabilies as amputation, blindness, cosmetic condition, as well as a general disability scale.

One of the more frequently used scales is the Attitudes Toward Disabled Persons Scale (ATDP) (Yuker, Block, & Younng, 1966). This scale consists of 30 Likert-type statements on a 6-point rating scale. The response ranges from "I disagree very much" to "I agree very much". The ATDP is intended to measure a unidimensional aspect of attitude, namely general affect.

The psychometric properties of this scale were shown to be quite strong. Test-retest reliability of

the scale was found to be .71 and .83 (intervals at 4 months and 5 weeks). Split-half reliability (using Spearman Brown Prophesy formula) was reported at r = .87. Because of the topic nature of the questionnaire, the issue of subjects responding in a socially desirable manner has been tested in numerous studies by administering subjects the Edwards' Social Desirability Scale and/or the Marlowe-Crowne Social Desirability scale along with the ATDP. Results showed that social desirability was not a significant component of responses on the ATDP. Furthermore, the ATDP has well documented construct and predictive validity. For example, the ATDP has been found to correlate highly (r= .84) with the Disability Factor Scale (Siller, Ferguson et al., 1968).

Another scaling procedure is the semantic differential scale technique (Osgood, Suci, & Tannenbaum, 1957). Its purpose is to assess the semantic connotations of a concept (e.g., voice quality) for the person doing the rating. Each concept is rated on a set of scales with bipolar adjectives serving as the extreme endpoints of the scales (e.g. strong-weak). Semantic differential scales, although ubiquitous for other purposes, have been used only in a few studies on attitudes and attitude change toward physically disabled persons (Clore & Jeffrey, 1972; Rapier, Adelson, Carey, & Croke, 1972; Sadlick & Penta, 1975). The Attitudes

Toward Disabled Persons Scale (Yuker, Block, & Younng, 1966), on the other hand, has been the preferred measure of attitudes toward the disabled due to the technical adequacy of the measure and its application to a wide variety of disabled populations (Towner, 1984). Recent studies employing this instrument to assess attitudes toward the physically disabled, alone, are numerous in the literature (Dahl, Horsman, & Arkell, 1978; Daniels, 1976; Donaldson & Martinson, 1977; Felton, 1975; Forader, 1970; Yerxa, 1978; Hafer & Narcus, 1979).

Thus, the use and/or development of a technically adequate instrument is a critical component in any research emphasizing attitude measurement. Clearly, the use of a statistically sound pre-existing instrument or the development of a research-specific attitude scale that has been validated with an existing one are two conceivable methods for dependent measure development. In addition, scale selection and/or development considerations should be made in regard to specific attitudinal correlates that may be of interest to the investigation.

Attitudinal Correlates

With regard to correlates which impact upon attitude formation, several primary areas of research have been emphasized: 1) disability type preferences, 2) experiential and behavioral correlates of attitudes, and

3) demographic correlates such as the gender and educational level of the non-disabled person completing an attitude measure.

Disability Type

Research into disability type preferences has focused on attitudes toward a wide range of disabilities: orthopedically handicapped, learning disabled, physically handicapped, seizure disordered, mentally handicapped, and mentally ill. In general, some differences do exist among the attitudes of able-bodied individuals toward persons with different types of disabilities (English, 1977; Jones, 1984).

Research on attitudes toward physically disabled persons has revealed that overall attitudes as measured by the Attitudes Toward Disabled Persons Scale are closely related to attitudes toward specific types of disabled persons (Siller & Chipman, 1965). These researchers found that the ATDP correlated significantly ($r = .31$, $p<.05$) with attitudes toward persons with cerebral palsy.

Severity. It has been postulated that a differential stigma or attitude exists in terms of the severity of the disablity. Farber (1968) theorized that there is greater tolerance of the severely intellectually impaired (IQ's below 50) than of the moderately and mildly impaired. This conjecture was based on the premise that incompetency precludes the

individual's responsibility for behaviors or for the intellectual limitations. Doctor & Sieveking (1970) reported that mildly impaired individuals are more psychologically and economically threatening to non-disabled persons.

Context. Experimental measurement of differential attitudes toward specific disability types has revealed the importance of a contextual variable. Freed (1964) adapted the Attitudes Toward Disabled Persons Scale to study attitudes toward the physically handicapped versus the mentally ill and the alchoholic. He found that when a context (e.g., "a party" or "at-work") was not specified, non-disabled individuals tended to have more positive attitudes toward the physically handicapped. Other researchers (English & Palla, 1971; MacDonald & Hall, 1969; Siller, 1963; Whiteman & Lukoff, 1965) have suggested that an aesthetic factor (e.g., physical appearance) significantly influences the non-disabled individual's social and personal preferences toward the disabled (English, 1977).

Experiential and Behavioral Correlates

Theoretically it has been assumed that attitudes non-disabled persons hold toward disabled persons are learned and a function of past experience (Wright, 1960). Societal rehabilitation, or the efforts to reduce the general public's biased attitudes toward

disabled individuals, has been an increasing concern of many professionals in recent years (Bindman & Spiegal, 1969; Caplan, 1970; Iscoe & Spielberger, 1970). High interest in this area has been paralleled with an increasing emphasis on mainstreaming and the social and legal status of the disabled (Towner, 1984). Several methods have been employed in an effort to change negative attitudes. Efforts have focused on three general techniques related to attitude change: 1) contact with the disabled, 2) information about the disabled, and 3) a combination of both contact and information (Anthony, 1984).

Information. Roeher (1961) was one of the first to suggest that accurate information can contribute significantly to a modification of attitudes. Several types of information have been employed: 1) selective information designed with specific attitudinal goals in mind (i.e., information about physical, mental, social status) presented either in print or verbally, 2) covert and overt positive reinforcement, and 3) persuasive communications. Berg & Wolleat (1973) found that participants assigned to a group that was exposed to information designed to promote positive attitudes had significantly more positive attitudes than a non-assigned group. In contrast to Anthony (1984), they suggested that information may be an alternative to providing contact.

Contact. Studies investigating the influence of contact on attitudes toward disabled persons have also employed a variety of techniques: 1) repetition leading to frequent contact with a credible source, 2) personal and social contact, 3) direct contact with the attitude object (such as in an educational setting), 4) vicarious role playing or observation, and 5) face-to-face contact through media (film, video- and audiotape).

Donaldson & Martinson (1977) investigated whether a panel discussion by physically disabled individuals might produce significant differences on dimensions of attitude. The panel discussion was conducted in four conditions: live presentation, video, audio, and a control condition. Results revealed significant differences between the live and video, live and audio, live and control in the direction of the live condition, and between video and control conditions in the direction of video. Significant differences were not revealed between the audio and video and the audio and control conditions. In contrast, Hafer & Narcus (1979) found that a film designed to advance positive attitudes, in fact, did just the opposite.

Studies emphasizing the effects of both contact and information on attitude change toward the physically handicapped (Anthony, 1969, Rusalem, 1967; Anthony & Cannon, 1969; Granofsky, 1966), the mentally retarded (Efron & Efron, 1967; Rucker, Howe, & Snider, 1969) and

the mentally ill (Spiegal, Keith-Spiegal, Zirgulis, & Wine, 1971; Chinsky & Rappaport, 1970) have revealed similar findings: 1) attitudes toward persons with disabilities can be influenced positively by providing the person with an experience that includes contact with the disabled person and information about the disability, 2) information without contact has only a limited positive effect or may reinforce existing negative attitudes, and 3) information without contact has little or no effect on attitudes.

Demographic Correlates

Gender. At present, there does not seem to be a consensus regarding which gender has a more favorable attitude toward the disabled. A majority of studies, however, has demonstrated that females have more favorable, accepting, positive attitudes toward the physically disabled than males (Yuker, Block, & Campbell, 1960; Freed, 1964; Lukoff & Whiteman, 1963; Siller, 1964; Higgs, 1972; Lazar, Orpet, & Fogg, 1971 Conine, 1969; Titley & Viney, 1969). Higgs (1972) found that females were not only more positive but also more knowledgeable about disabling conditions and tended to have more contact with disabled persons. In contrast, non-significant differences were reported between males and females in studies by Bell (1962), Freed (1964),

Siller & Chipman (1965) and Donaldson & Martinson (1977).

Educational Level. Studies examining the relationship between educational level and attitudes (Auvenshire, 1962; Jabin, 1966; Siller, 1964; Yuker, Block, & Younng, 1966; Byrd & Elliott, 1984) have revealed that college students demonstrate more positive attitudes toward disabled persons than younger students (junior high and high school) but that attitudes are increasingly more favorable at each higher grade level. Thus, it appears that education in general contributes to the overall development of positive attitudes (English, 1977).

Research has demonstrated that experiential, behavioral, and demographic correlates play significant roles in attitude formation and attitude change toward the disabled. Although a number of variables have been investigated, certain discrepencies in findings exist. The existence of this in the literature lends support for the need for further investigation.

Attitudes Toward Communication Impairments

Investigations into attitudes about speech, language, and hearing impairments have focused on both the attitude of the person who has a communication impairment and on attitudes toward individuals with communication impairments. Studies have been conducted on attitude formation toward a variety of communication

impairments: fluency disorders (Andrews & Cutler, 1974; Guitar & Bass, 1978; Silverman, 1980); voice disorders (Blood & Hyman, 1977; Blood, Mahan & Hyman, 1979); articulation disorders (Ashmore, 1958; Marge, 1966; Silverman, 1976; Mulac, Hanley, & Prigge, 1974; Mowrer, Wahl, & Doolan, 1978); alaryngeal speech/speech aid users (Hyman, 1955; Crouse, 1962; Snidecor, 1968;Gillmore, 1961; Lauder, 1968; Bennett & Weinberg, 1973; Gates, Ryan, & Lauder, 1982; Edelman, 1984); and hearing impairment and hearing aid users (Blood, Blood, & Danhauer, 1977, 1978; Danhauer et al., 1980; Iler, Danhauer, & Mulac, 1982).

It is apparent that findings from investigations into attitudes toward communication impairments hold important theoretical and clinical implications. Information about attitudes toward various communication impairments may lend insight into the conceptual understanding of what should or should not be classified as a communication impairment. Findings regarding attitudes toward communication impairments may very well lend the necessary insight needed for the development of various therapeutic techniques. Some of the critical research on attitudes toward voice disorders, hearing aid users, and individuals who use esophogeal speech or an artificial larynx is presented. Each of these areas provides an interesting perspective from which to regard

the final section on augmentative communication.

Voice Disorder

Blood, Mahan and Hyman (1979) examined the effect of voice disorders on judgments of personality and appearance. The semantic differential technique (Osgood et al., 1957) was employed in order to obtain ratings on twelve bipolar adjectives. Recordings were made of twelve female speakers: four with normal voice, four with harsh-breathy voice, and four with hypernasal voice. Subjects were required to view a photographic slide accompanied with the simultaneous presentation of a pre-recorded reading passage. The results suggested that a listener perceives a speaker with a voice disorder in a more negative manner when asked to evaluate dimensions of personality and appearance. The researchers suggested that a voice disorder is a handicap in that other people react negatively towards it, and that it conveys information about the speaker.

Hearing Aid Users

Blood, Blood and Danhauer (1977) investigated observers' impressions toward children with or without hearing aids. Visual (photographic slides) and auditory (voice) stimuli were presented to observers. They rated each child on a semantic differential scale consisting of twenty bipolar adjectives associated with intelligence, activity, personality and appearance. The results revealed that observers' ratings for the aided

condition were significantly lower than ratings for the unaided condition. The researchers questioned the possibility that a child might be further handicapped by the very tool which is used to reduce his/her problem. They recommended that design factors of hearing aids should focus on both appearance and acoustic performance factors.

Iler, Danhauer, & Mulac (1982) investigated whether geriatric observers formed different impressions of their peers shown in three different hearing aid conditions. In contrast to the findings of Blood et al. (1978) and in part those of Danhauer et al. (1980), this study did not find a "hearing aid effect." These researchers speculated that their findings might be attributed to a more general acceptance of hearing aid use by the geriatric population as opposed to a younger population.

Alaryngeal Speech

Bennett & Weinberg (1973) investigated listener preference of esophogeal speakers and users of artificial larynges. They found that listeners rated normal speech more acceptable over any form of alaryngeal speech and esophogeal speech over two types of artificial larynges (Western Electric and Bell 5A). These results concurred with those of Crouse (1962) and Snidecor (1968).

The development of more flexible attitudes toward the early rehabilitative use of speech aids (electic larynx) has evolved gradually over the the past decade. Although Edelman (1984) found an unequivocal preference for esophogeal speech production by four professional groups, there is a trend for the integration of a speech aid and esophogeal speech in the rehabilitative process (Berry, 1978; Goldstein, 1978; Salmon, 1983). In addition to using speech aids, some alaryngeal individuals have used relatively simple alternative means to communicate, such as pencil and paper notes, word books, etc. However, in the past few years, some alaryngeal individuals have begun to use more sophisiticated and technological augmentative or alternative communication systems.

Augmentative Communication

Serious clinical and scientific interest in augmentative and alternative communication began during the 1970's. Several factors contributed to this growth. With impetus from Public Law 94-142 (Education of the Handicapped Act) and Public Law 95-602 (Rehabilitation Act of 1978) interest in augmentative communication grew out of an increasing awareness that individuals who exhibit extreme difficulties with oral speech production are entitled to communication services designed to aid or augment their present communication abilities. In addition, advances in computer and voice synthesis

technology have provided new avenues for the development of communication aids and for defining and exploring the spacial representation of language in such communication systems (Eulenberg, Reid, & Rahimi, 1977).

In 1981, the American Speech-Language-Hearing Association published a position paper on nonspeech communication thereby formally recognizing this area of clinical and scientific interest. The purpose of the paper was to provide common "working" terminology in order to promote interaction across disciplines working in the area of nonspeech communication. The paper defined augmentative communication system as the "total functional communication system of an individual which includes: 1) a communicative technique 2) a symbol set or system and 3) communication/interaction behavior" (Asha, 1981, p. 578). The paper defined the term aided as communication techniques which require some physical medium (in addition to one's body) in order to display symbols or symbol sets. For example, one type of "physical" aided technique is an alphabet-letter board. An example of an electronic aided technique is a computerized voice output communication aid (VOCA). Unaided techniques were defined as those methods that use manual, facial/body, vocalizations or verbalizations in order to express information.

Several critical factors related to the use and

acceptance of augmentative communication systems require consideration. One, demographic data have revealed that there are approximately one and a half million non-speaking children and adults in the United States.[1] Two, rapid advances in the development of augmentative communication systems are occurring. Thus, it is expected that increasingly greater numbers of individuals will be using communication aids in the years to come. Three, as indicated previously, greater numbers of handicapped or disabled persons have either entered or are entering into the "mainstream" of society.

Thus, issues related to the societal rehabilitation of attitudes toward disabled persons should encompass factors associated with attitudes toward communication aid users. Two questions arise: "How will society react toward different types of communication aids?" and "What factors are associated with attitudes toward communication aid users?"

To date, there are few, if any, emipirical data on the attitudes of non-disabled persons toward individuals who use augmentative communication aids. In a survey of 237 special educators, Shrewsbury, Lass, & Joseph (1985) found that the successful use of communication aids by non-speaking children in schools required a positive attitude on the part of the school personnel. Shane & Bashir (1980) stressed the importance of acceptance of a

nonspeech communication system as the most powerful factor in the decision-making process related to whether an augmentative communication system should or should not be implemented. Yoder (1984) in an opening address at the Third International Conference on Augmentative Communication called for research on attitudes toward non-speaking individuals. The purpose of the present investigation is to contribute empirical data addressing this unaddressed issue.

The present investigation is directed at answering the following questions: 1) What effect does the type of augmentative communication technique have on attitudes toward non-speaking individuals? More specifically, what are the attitudes of non-disabled persons toward physically disabled, non-speaking individuals who: a) use an unaided augmentative communication technique, b) use an aided, alphabet-letter board augmentative communication technique, and c) use an aided, electronic, voice-output communication aid (VOCA)? 2) What effect does the presence or absence of information (about the non-speaking individual) have on the attitudes of non-disabled persons toward physically disabled, nonspeaking persons using different augmentative communication techniques?

It is expected that attitudes will be significantly more favorable toward an individual using a more

sophisticated augmentative communication technique and that the presence of information will significantly influence attitudes in the direction of favorability. Furthermore, it is expected that these two variables will interact to increase the favorability of attitudes toward the non-speaking individual. In addition to main effects of information and augmentative communication technique, it is expected that as the technique becomes more sophisiticated (i.e., electronic), the introduction of auxiliary information concerning the academic and social competency of the individual will serve to further enhance attitude favorability.

CHAPTER II

METHOD

Subjects

Subjects were 151 undergraduates at a large southwestern university who were enrolled in an introductory psychology course and received credit towards the course for participation in the study. 78 of the subjects were males and 73 were females. Subjects were run in groups of ten to twenty. They were randomly assigned to the six experimental conditions formed by the factorial combination of augmentative communication technique (unaided, alphabet board, electronic aid-VOCA) and information (presence or absence).

Experimental Stimulus

Videotapes. Three videotapes were prepared which depicted a physically disabled, non-speaking male having a communicative interaction with a non-disabled female. The recording equipment was controlled by the experimenter in a room adjacent to the filming room. The rooms were connected by a two-way mirror. The dyad participants were seated in the filming room, a large room free of extraneous distractions or stimuli. They were positioned at a comfortable distance from each other (approximately two feet). The non-speaking

individual was positioned at a 45-degree camera angle in order to facilitate an optimal viewing perspective. The non-disabled person was positioned at a 90-degree camera angle (side view) in order to facilitate a non-distracting, non-focal viewing perspective.

Dyad participants. The non-speaking male was a 22-year old, undergraduate student with quadriparetic spastic cerebral palsy from birth. He required the use of an electric wheelchair which he operated with his right hand. Results from the Peabody Picture Vocabulary Test (Dunn, 1965) revealed a vocabulary recognition level over the 18 year old ceiling of the test. His oral speech was diagnosed as being spastic dysarthria characterized by the commonly appearing clusters of speech and voice dimensions outlined by Darley, Aronson, & Brown (1975). On the Assessment of Intelligibility of Dysarthric Speech test (Yorkston & Beukelman, 1981) he achieved a sentence intelligibility score of 39% at a speaking rate of 45 words per minute. His intelligence was assumed to be within normal limits given his academic status. He reported that depending on different communicative purposes, he had relied on the use of his own voice throughout his life, an alphabet-letter board on a number of occasions, and a customized voice-output communication aid (VOCA) during the last two years (see section on independent variables for description). A functional assessment of his ability to

use the alphabet board and the VOCA revealed more than adequate skills for a variety of communicative contexts. He was naive to the purpose of the research.

The non-disabled female participant was a 23-year old graduate student in speech-language pathology who was also naive to the experimental purpose. She reported that she had no previous experience interacting with non-speaking individuals using augmentative communication aids.

Script. In order to control for possible effects of conversational styles across experimental conditions, the same script was employed in each tape (see Appendix A). The script was constructed to reflect a rather broad range of communicative functions. For example, there were equal numbers of affirmative responses, exchanges, descriptive statements and informative statements elicited by each participant. The non-speaking participant elicited a total of 61 words; the non-disabled participant elicited 69 words.

Independent Variables. In order to determine the effect of different augmentative communication techniques on the perception of and attitudes toward a non-speaking individual, the videotapes used as experimental stimuli differed in the type of augmentative communication system employed. Specifically, Video Tape 1 depicted the non-speaking

individual using an unaided communication technique (facial/body gestures, vocal/verbalizations). In this videotape, he used his own voice and any naturally occurring facial and body gestures to communicate. Video Tape 2 depicted the non-speaking individual using a non-electronic alphabet board. The alphabet board (15" X 24") contained 2" black letters on a white background arranged in the standard alphabetic order. The board was mounted on the wheelchair to facilitate optimal access for direct selection. The non-speaking individual direct selected each letter of every word by pointing with either his right or left index finger. Video Tape 3 depicted the use of a computer-based voice output communication aid (VOCA) that was developed at the Artificial Language Laboratory at Michigan State University. This portable VOCA, mounted on the user's wheelchair, is operated via a standard laptop computer keyboard (TRS 80 Model 100). The VOCA is programmed to accept three types of input and to produce synthetic voice output. The first input mode is direct text-to-speech; the user types in an utterance in standard English orthography. The second input mode uses user-defined mnemonic abbreviations to retrieve full phrases and sentences. The third mode allows the user to utter any of a set of pre-stored, user-defined phrases with a single keystroke. The synthetic voice is produced with an adapted voice synthesizer (Intextalker) which uses

the Votrax SC-01 synthesizer chip. The non-speaking dyad participant used the first two modes for the purposes of the videotape.

The three augmentative communication techniques used in the investigation were selected because of their availability and because they reflected a range of augmentative communication techniques which are representative of what is currently available or used by non-speaking individuals.

In order to determine the consistency of the non-disabled participant's verbal responses in terms of paralinguistic features (tempo, pitch, and loudness) across the three videotapes, the following methodology was employed. Three independent examiners blind to the experimental purpose served as judges. These judges were randomly selected from a group of graduate students at a large southwestern university. They listened to the audio portion of the non-disabled participant's dialogue from each of the three videotapes and rated the speaker on two sets of semantic differential scales (see Appendix B). The order of presentation of the three audio tapes was counterbalanced across judges. No significant differences were found between the judges' mean ratings of the non-disabled participant's audio portion across the three videotapes, thereby demonstrating the consistency of the stimulus.

The second independent variable, presence or absence of information, was prepared in the form of a printed information sheet (Appendix C) with specific attitudinal goals in mind. The information sheet contained factual information about the non-speaking person's physical disability, social activities, and academic and employment status.

Attitude Scale

In order to develop a scale to assess attitudes toward non-speaking persons, opinion statements representative of a broad range of favorableness and relevant to the issue were constructed. These statements were self-generated by the investigator in accordance to procedures outlined by Petty & Cacioppo (1981).

Pretest Scale

Two questionnaires, each composed of 30 Likert statements (see Appendix D), were constructed. The first questionnaire consisted of 30 items (investigator-generated) designed to measure attitudes toward the non-speaking. There were equal numbers of positively and negatively worded items in order to control for response bias (either negative or positive). For example, the statement "This person understands what people say" is a positively worded statement. In contrast, the statement "You should not expect too much from this person" is a negatively worded statement. This

questionnaire is called the Attitudes Toward Nonspeaking Persons Scale (ATNP). The second questionnaire was the Attitudes Toward Disabled Persons Scale (ATDP) Form B (Yuker, Block and Younng, 1966) with the substitution of the word nonspeaking person for disabled person. On both questionnaires, subjects responded to each statement on a five point scale with end points of "Strongly Agree" and "Strongly Disagree".

In order to determine the reliability or internal consistency of the ATNP, it was administered to three groups of subjects (42 undergraduates at Michigan State University enrolled in an introductory speech course). In order to validate a measure which taps attitudes toward the non-speaking (i.e., ATNP), it was necessary to define areas of research that also tap this; a modified ATDP was administered for this purpose. The correlation between the two questionnaires served as the validity coefficient for the ATNP. Presentation order of the two scales was counterbalanced.

Subjects were randomly assigned to one of the videotape conditions (i.e., Unaided, Alphabet Board, VOCA) and were requested to complete the questionnaire immediately following the viewing of the videotape.

Reliability. Results from the reliability analysis (Cronbach, 1951), showed the Attitudes Toward Non-Speaking Persons Scale to be internally consistent (alpha = .89). With the deletion of one item

("You have to be careful what you say to this person") the reliability coefficient was raised to an alpha of .90. This item was found not to correlate with any other item and was therefore discarded for the purposes of the experimental attitude measure.

Reliability analysis of the modified Attitudes Toward Disabled Person Scale (Yuker, Block, & Younng, 1966) also revealed good internal consistency (alpha = .73), this being of acceptable magnitude (Crano & Brewer, 1986).

Validity. In order to determine the validity of the ATNP Scale, a two-tailed Pearson Correlation Coefficient between the Attitudes Toward Non-Speaking Persons Scale and the Attitudes Toward Disabled Persons Scale (Yuker, Block, & Younng, 1966) was calculated. Results revealed an $r = .33$, $p<.01$, thus indicating the ATNP to be a valid measure of attitudes toward the non-speaking.

Experimental Scale

Based on the results from the pretest, a 29 item scale (see Appendix E) from the ATNP was administered to the subjects in the six experimental conditions. Hereafter, reference to the ATNP indicates this 29-item scale.

In order to determine whether experience or contact with disabled persons had an effect on attitudes, a

final item on the questionnaire asked subjects whether or not they had had direct contact with physically disabled individuals. Contact was operationally defined as having worked or lived (friend or family) with an individual who was physically handicapped.

Experimental Procedure

Subjects were informed by the experimenter that the study was concerned with how people make judgments. Subjects were then told the following with respect to the condition they served in: "You will be seeing a short videotape in which two people are having a conversation. One of the persons is in a wheelchair and is: using his own voice to communicate (Unaided condition); using an alphabet letter board to aid or augment his communication (Alphabet board condition); using a computerized communication aid that has a voice synthesizer to aid or augment his communication (VOCA condition)." Following these instructions half of all subjects were given the information sheet to read.

The videotape was then shown on two television monitors (Sony 24" Trinitron Videotek) positioned in the front of a large group room. Following the videotape presentation, information sheets were collected in designated conditions and subjects were given the attitude questionnaire (ATNP). After completing the questionnaire, subjects were debriefed and dismissed.

CHAPTER III

RESULTS

Experimental Attitude Measure

Reliability analysis of the 29-item ATNP Scale employed during the experimental phase was conducted. The ATNP was found to be reliable and internally consistent (alpha = .95). In this regard, subjects' responses on the ATNP Scale were found to correlate highly with one another and be similarly affected by experimental treatments, thus contributing to the reliability of the measure.

In order to identify the number of variables or categories associated with the ATNP, a common factor analysis with varimax rotation (Kaiser, 1958) was performed on the data from the 29-item scale. This resulted in two orthogonal psychologically meaningful factors. The first factor consisted of 19 items focused on a general evaluation of the non-speaking person. This factor accounted for 83% of the variance. Nine of the 19 items were reverse worded (i.e., negatively worded). Typical items loading on this factor were "This person is not intelligent" and "This person should expect to lead a normal life." The second factor, consisting of 10 items, focused on an interactive/affective component of attitude toward the non-speaking person. Five of the ten items were reverse

worded. Typical items loading on this factor included "I would feel uncomfortable with this person" and "This person would be easy to talk to." The coefficients of internal consistency of the general evaluation and the interactive/affective factors were strong (coefficient alpha = .94, .88, respectively); these results clearly indicate the existence of two subscales within the ATNP measure.

As might be expected, both factors (evaluative and interactive/affective) were found to correlate significantly with the ATNP (r = .96, .83, $p<.001$, respectively). In addition, the evaluation factor was found to correlate significantly with both of the independent variables, information and augmentative communication technique (r = .21, .33, $p<.01$ respectively). Subjects exposed to the information displayed gave a more favorable evaluation of the non-speaking person. Similarly, as the communication technique became more sophisticated, evaluations became more favorable. Items loading on the interactive/affective factor correlated significantly with augmentative communication technique (r = .27, $p<.001$), whereas a non-significant correlation was revealed with information (r = .13, $p<.09$).

Data Analyses: Attitude

A 3 (Augmentative Communication Technique) X 2 (Information) analysis of variance was performed on the attitude data. The ANOVA revealed significant main effects for augmentative communication technique, $F(2, 145) = 8.92$, $p<.001$, and for information, $F(1, 145) = 5.34$, $p<.02$. No two-way interaction was found. The means for these main effects are presented in Table 1.

Table 1. Mean Attitude Ratings as a Function of Communication Technique and Information

	Augmentative Communication Technique		
	Unaided	Alphabet Board	VOCA
Information	111.47 (19)	117.75 (32)	128.89 (27)
No Information	104.70 (27)	114.23 (22)	118.38 (24)

Note: Higher numbers reflect more favorable attitudes. Numbers in parentheses represent cell sizes.

As shown in Table 1, mean ratings on the ATNP Scale were more favorable in the information condition than in the no-information condition. In addition and as predicted, as the augmentative communication technique became more sophisticated, attitudes toward the non-speaking person became more favorable.

To inspect these results more precisely, a Least Significant Differences test (Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975) was conducted for comparing

pairs of group means of the independent variable augmentative communication technique. The Multiple Range test within this procedure revealed that for each of the communication technique conditions, each group mean was found to be significantly different from every other, $F(2, 150)= 9.70$, $p<.0001$. The group means for the unaided, alphabet board, and VOCA conditions were 107.50, 116.31, and 123.94 respectively.

Factor scales. To inspect the evaluation and interactive/affective subscales derived from the factor analysis more closely, a 3 (Augmentative Communication Technique) X 2 (Information) analysis of variance was performed on each of the subscale's attitude data. The results of these analyses are presented in Table 2.

Table 2. Analysis of Variance Table for Evaluation and Interactive/Affective Scales

		Evaluation		Interactive/Affective	
Source	df	MS	F	MS	F
Information (I)	1	1088.9	6.10*	97.4	1.82
Technique (T)	2	1524.1	8.54**	299.0	5.60*
I X T	2	97.1	.54	15.2	.28
Error	145	178.3		53.3	

*p<.01
**p<.001

As shown in Table 2, the ANOVA on the evaluation scale revealed significant main effects for augmentative communication technique, $F(2, 145) = 8.54$, $p<.001$, and for information, $F(1, 145) = 6.10$, $p<.01$. Quite interestingly, in comparison to the evaluation scale, the ANOVA on the interactive/affective scale revealed a main effect for augmentative communication technique, $F(2, 148) = 5.60$, $p<.01$, with the means replicating the same pattern found in the initial ANOVA. However, a non-significant effect for information was revealed, $F(1, 148) = 1.82$, n.s.

In regards to gender differences in attitudes toward the non-speaking, an analysis of variance revealed no significant difference on the ATNP as a function of sex, although females were found to display a somewhat more favorable attitude (M = 116 for males; M = 120 for females). Although these means were not significantly different, a significant correlation was found between the ATNP and sex (r = .21, $p<.01$). Furthermore, results from an ANOVA conducted to determine whether subjects' prior contact with disabled persons had an effect on attitudes toward non-speaking persons revealed a non-significant effect, $F(1, 140) = .09$, n.s..

CHAPTER IV

DISCUSSION

The results of this investigation strongly support the hypothesis that attitudes are significantly more favorable toward an individual using a technological augmentative communication technique such as a VOCA (computer-based voice output communication aid).[2] Significant differences in mean attitude ratings were found between each of the communication technique conditions. The results also support the hypothesis that additional information concerning the non-speaking individual has an effect on the formation of more favorable attitudes toward a non-speaking individual using an augmentative communication technique. Contrary to an initial hypothesis, no interaction was found between the two independent variables, information and augmentative communication techniques.

Information and Communication Technique

The results of the present study revealed that information and augmentative communication technique operate in a main effects manner on attitudes toward the non-speaking. This lack of interaction suggests that there are two avenues available for addressing the problem of negative attitudes toward the disabled (Barker et. al, 1953; Siller, 1976). Rather than having a combined effect on attitudes, the

provision of information concerning the non-speaking person and the use of a technological augmentative communication technique operated independently to increase attitude favorability.

The absence of an interaction between the independent variables may be viewed in a positive light. Just as major urban areas have more than one highway system for reducing heavy traffic, so may two separate avenues be employed for reducing negative attitudes. Rather than requiring two synergistic variables in order to facilitate positive attitudes, only one, either the use of a technological augmentative communication technique or information, is needed.

It should be emphasized, however, that the purpose of technological augmentative techniques or aids is to help non-speaking individuals communicate and not for the purpose of impression formation or enhancing favorable attitudes toward the non-speaking per se. Nonetheless, the results of this study suggest that an individual working in the field of rehabilitation, such as a speech-language pathologist, occupational therapist, nurse, etc., as well as a non-speaking person, might elect to use either a technological communication technique or information about the non-speaking population in order to promote positive attitudes.

The decision to employ information or an augmentative communication technique for the purpose of changing negative attitudes would be dependent on several criteria. Criteria would be established in regard to the contextual situation, the availability of time, and even the form of medium used such as magazine or newpaper articles, radio broadcasts, television/video programs, or live face-to-face situations. For example, a non-speaking individual seeking employment might elect to send off a resume containing pertinent information to a prospective employer. This information alone might promote a favorable attitude regarding a general evaluation of the individual. Another non-speaking individual during a face-to-face interview process elects to use a technological augmentative communication technique (as opposed to an unaided technique) for communication purposes and to enhance attitude favorability. Both methods, resume information and using a VOCA, employed separately may result in enhanced attitude favorability.

It is expected that the use of both of these variables will produce a greater or more widespread impact in the process of societal rehabilitation of attitudes toward the physically disabled, non-speaking population. The press and television, both forms of information, have a persuasive power on attitude

formation. In regards to non-speaking individuals, information provided in the form of print or demonstration and use of technological augmentative communication tools will facilitate more favorable attitudes.

It is expected that not only will these avenues provide opportunity for greater public awareness of non-speaking individuals who use augmentative communication aids but may serve to enhance more favorable attitudes. In this regard, use of these avenues may facilitate a meta-communication perspective of the non-speaking. A greater understanding of the communication (and other) abilities of the non-speaking lends itself to more communication about the non-speaking. This perspective might lead to increased funding sources for the appropriation of technological tools, educational and vocational policy changes, and enhanced litigation proceedings for the non-speaking. In a futuristic vein, if the needs of the non-speaking are recognized (due to favorable attitudes) in terms of the appropriation of sophisticated augmentative technology there may not be a need for litigation with emphasis on technology.

Thus, the findings from this study suggest that either carefully selected information regarding the physical, mental and social status of the non-speaking individual provided in the form of print or by demonstration and use of technological augmentative

communication tools will facilitate more favorable attitudes. Although these two separate avenues for facilitating favorable attitudes may potentially apply to a more diverse group of non-speaking individuals, caution must be exercised in generalizing these findings with respect to the type of non-speaking individual depicted in the experimental videotapes.

Contact. The finding regarding the effect of information on attitude favorability is consistent with that of Berg & Wolleat (1973) and others cited previously, but it is inconsistent with that of Anthony (1984) who suggested that information without contact has little or no effect on attitudes. In this study, no significant relationship was found when a subject received information and also reported having had previous contact or direct experience with physically disabled individuals. Furthermore, no significant differences were found between subjects who reported having had contact and those who had not. It is possible, as Siller (1984) suggests, that the specific type and extent of contact, as opposed to the mere presence or absence of contact, may have more of an effect on attitude favorability than previously thought. Even though contact was carefully controlled for in this study, the results suggest that information alone facilitates attitude favorability and that contact does

not have an effect.

Gender. The findings regarding no significant differences but a trend toward greater favorability by females in attitudes toward the non-speaking as a function of sex contributes additional evidence to the growing body of literature regarding gender differences. Although the majority of studies in the 1960's and 1970's demonstrated that females had more positive attitudes, more recent studies have revealed that there are no significant differences between sexes. One possible explanation for this is that prior to the mid-1970's, societal expectations were such that it was deemed less masculine to be close to or to be a caregiver for the handicapped. Since then, sex roles have become somewhat neutralized in a variety of areas thus lending a similarity in attitudes toward the disabled.

Scales

The results of this study have also demonstrated the utility of a scale which can be used to assess attitudes toward the non-speaking. Furthermore, this study lends support to the premise that technically adequate measures must, and can, be carefully developed for the investigation of attitudes toward the disabled (Siller, 1984; Towner, 1984) and toward various communication disorders.

Of interest were the results of the analysis

conducted on the two subscales, general evaluation and interactive/affective, derived from the factor analysis on the experimental Attitudes Toward Non-Speaking Persons Scale. As discussed previously, information and augmentative technique can be employed separately. However, the results from the analysis on the two subscales revealed that the interactive/affective subscale displayed no effect as a function of information. This implies that the fact of simply providing information concerning the non-speaking person will be ineffective if the attitude target is a tendency toward interaction or emotional disposition toward the non-speaking individual. It appears that the technological augmentative technique independently affects the person's attitude toward interaction with the non-speaking person, whereas information has no influence on this component of attitudes. This is not the case regarding attitudes concerning a general evaluation of the non-speaking person; both information and augmentative technique operate effectively. With reference to the previous example, it would be advisable for a non-speaking individual interviewing for a job that requires interaction with other employees to use a technological augmentative communication technique.

In some respects, the finding concerning information on interaction supports and even augments

the position suggested by Jones & Guskin (1984): "What evidence tells us is that when little additional information is available about a handicapped individual, people who are asked to state their preferences report less willingness to become close with a handicapped rather than a nonhandicapped person" (p. 6). In this study, even with the provision of factual information about the non-speaking person, subjects when asked to rate the degree to which they would interact in various ways (e.g., I would help this person with a task such as purchasing something) responded with less favorable ratings. What these findings seem to imply is that in order to increase interaction and, at best, communicative interaction between non-speaking individuals and able-bodied persons, much more is needed than verbal or printed information about the person's physical status, intelligence, academic achievements, and social activities; the use of a computer-based communication system is necessary.

This study also sheds additional light on research findings demonstrating that the provision of a non-electronic augmentative communication system (letter or word board) to a non-speaking individual will not assure effective communication and interaction (Calculator & Dollaghan, 1982; Calculator & Luchko, 1983). Subjects in the present investigation responded in a more favorable manner toward interacting with a non-speaking

person who was using a portable VOCA as opposed to an alphabet board or not using any augmentative aid at all.

The use of the wrong aid, the inappropriate use of an aid, technological or not, or reduced use of an aid may incite negative attitudes. As suggested by Blood et. al (1977) who investigated perceptions of individuals wearing different types of hearing aids, individuals might actually be more handicapped by the very tool that they are using. Appropriate technology places things in a different light.

It is important to emphasize the value of technology for the disabled. Emerging technologies continue to affect the rehabilitation process and access to appropriate tools becomes an essential factor in the elimination of handicaps. Just as the technology of eyeglasses has helped countless bright individuals from being virtually ineducable and severely disabled in our society, so may today's and tomorrow's technology help eradicate handicaps. Handicaps may be viewed as sociological and technological artifacts (Eulenberg, 1976). They are un-made as a result of the evolution of technology matched with the evolution of personal and public acts of cognitive and emotional re-tracking. Thomas (1982) defined re-tracking as a process that "involves discarding cumulative and unhelpful sterotypes, both over-positive and over-negative, in a

search for a more authenic mode of perception, reflection and social action" (p. 185). Inherent in the process of cognitive and emotional re-tracking are factors related to a general evaluation and an interactive/affective component, both of these being evident in the development and verbalization of positive attitudes toward the non-speaking and the disabled. In an effort to facilitate the re-tracking process, it is expected that research and development in rehabilitation technology will assume a primary role.

Tools, such as augmentative communication systems, must be adapted physically, aesthetically, and psychologically for the non-speaking individual. As importantly, technological tools, such as voice output communication aids, must be made available to individuals who need them in order for these individuals to be accepted more positively by society. It is speculated that the absence of a sophisticated augmentative tool actually stigmatizes the individual as being more severely disabled. The stigma is elucidated further not only by the lack of an appropriate tool but a prevailing cognition that a choice must be made between maximizing technical performance and the aesthetics or beauty of a tool. The ability to choose a personal color, size, voice quality, or other additional features of an augmentative communication tool needs to be made available to non-speaking individuals.

Future research on VOCA development should address several factors. A balance between technical design factors or values and aesthetics is needed. In particular, careful selection of design factors which relate to the presentation of self on the part of the VOCA user should be coupled with optimizing those technical design factors in order to reduce the visibility/stigmatizing aspects of present-day VOCA's.

This study sought to explore the effect of different present-day augmentative communication techniques and information on attitudes of non-disabled persons toward non-speaking individuals. Future research should attempt to delineate whether specific quantitative and qualitative VOCA related variables have an effect on attitudes. Variables for investigation might be the size or positioning of the VOCA, the symbol set, vocabulary size, the method of selecting vocabulary, and the quality or type of voice synthesis such as age- and gender-appropriate or familial voice output (Eulenberg, Wood, & Finkelstein, 1985).

It is only through such investigations that the true potential of augmentative communication technology will be realized. The fruits of such research and the ensuing technology will not only enrich the experiences and communication of non-speaking individuals but our society as well. With the aid of technology and

exacting information channels, perhaps society as a whole will be truly emancipated from the restraints of previous beliefs, behaviors, and feelings regarding the non-speaking population.

APPENDICES

APPENDIX A

Script

(1) = Normal speaking individual
(2) = Non-speaking individual

1 Hi, how are you?

2 Fine, and you?

1 I'm O.K. It's pretty nice today.

2 Yes, getting cold, though.

1 I know. I sure like summer better. Although fall is O.K.

2 I like fall, too. The leaves are nice, the cool air... By the way, did you see the game?

1 Yes, it was great. They sure are something. I didn't think they'd win. But, they did. Did you think they'd win?

2 No. But, the game was good. I liked it. So, where are you going?

1 I'm off to lunch soon. I'm starving. I didn' have any breakfast.

2 I have some things to do.

1 Oh, by the way, did you see Sue?

2 Yes.

1 Where?

2 She was at the store. That reminds me, I have to get going.

1 Me too. Well, see ya...bye.

2 Bye.

APPENDIX B

Semantic Differential Rating of Dyad Participant

INSTRUCTIONS: One purpose of this study is to measure the meanings of things to people by having them judge them on a series of scales. In taking this test, make your judgments on the basis of what these things mean to you. You will be asked to judge the concepts voice type and voice quality based on the audio tape you heard. Here is how you are to use the scales.

If you feel the concept at the top of the scales is very closely related to one end of the scale, you would place your mark as follows:

fair X : : : : : : unfair

or

fair : : : : : : X unfair

If you feel that the concept is quite related to one or the other end of the scale, but not extremely, you should place your check mark as follows:

strong : X : : : : : weak

or

strong : : : : : X : weak

If the concept seems only slightly related to one side as opposed to the other side, but is not really neutral, then you should check as follows:

active : : X : : : : passive

or

active : : : : X : : passive

The direction toward which you check, of course, depends upon which of the two ends of the scale seem most characteristic of the thing you're judging. If you consider the concept to be neutral on the scale, both sides of the scale equally associated with the concept, or if the scale is completely unrelated to the concept, then you should place your mark in the middle space:

safe___ : ___ : X : ___ : ___ dangerous

IMPORTANT: Place your check marks in the middle of spaces, not on the boundaries (:). Be sure you check every scale for every concept.

Voice Type

kind___ : ___ : ___ : ___ : ___ : ___ cruel
nice___ : ___ : ___ : ___ : ___ : ___ awful
pleasant___ : ___ : ___ : ___ : ___ : ___ unpleasant
strong___ : ___ : ___ : ___ : ___ : ___ weak
loud___ : ___ : ___ : ___ : ___ : ___ quiet
rugged___ : ___ : ___ : ___ : ___ : ___ delicate
fast___ : ___ : ___ : ___ : ___ : ___ slow
active___ : ___ : ___ : ___ : ___ : ___ passive
sharp___ : ___ : ___ : ___ : ___ : ___ dull

Voice Quality

A. Pitch

appropriate___ : ___ : ___ : ___ : ___ : ___ inappropriate

B. Loudness

soft___ : ___ : ___ : ___ : ___ : ___ loud

C. Tempo

slow___ : ___ : ___ : ___ : ___ : ___ fast

APPENDIX C

Information Sheet

John (not his real name) is a physically handicapped person who has cerebral palsy. His cerebral palsy is the result of brain damage that occurred at birth. Because of this, John cannot walk and cannot speak clearly with his own voice. He uses an electric wheelchair that he operates himself to get around. John likes to go to sporting events and often does his own shopping. He enjoys movies, reading, using computers, and camping.

John was a student at a university for four years and recently received a Bachelor of Science degree. He plans to work in his chosen field. Last summer, he was employed by IBM Corporation in their student training program.

APPENDIX D

Pretest Questionnaire

Below you will find a number of statements. The words, this person refer to the person in the wheelchair on the videotape. Please answer all of the questions by circling your choice on the scales provided for each question. Base your answer on your own beliefs and behavior. Indicate whether you Strongly Agree (SA), Agree (A), are Undecided (U), Disagree (D), or Strongly Disagree (SD) with each statement.

SA A U D SD I would study (for a class) with this person.

SA A U D SD I respect this person.

SA A U D SD I do not feel sorry for this person.

SA A U D SD This person is not intelligent.

SA A U D SD This person would be easy to talk to.

SA A U D SD This person is not capable of giving a short speech to a class.

SA A U D SD I would help this person with a task such as purchasing something.

SA A U D SD This person is trustworthy.

SA A U D SD You have to be careful what you say to this person.

SA A U D SD This person won't make a contribution to society.

SA A U D SD This person understands what people say.

SA A U D SD This person is sociable.

SA A U D SD I do not feel any sympathy for this person.

SA A U D SD I would feel uncomfortable with this person.

SA A U D SD I would feel inhibited with this person.

SA A U D SD I would not trust this person.

SA A U D SD This type of person would not be able to complete high school.

SA A U D SD You should not expect too much from this person.

SA A U D SD This person is as self-confident as other people.

SA A U D SD I would help this person obtain someone's attention.

SA A U D SD I would feel anxious around this person.

SA A U D SD This person would be successful in a job.

SA A U D SD This type of person is mentally handicapped.

SA A U D SD This person should expect to lead a normal life.

SA A U D SD I would feel uncomfortable answering questions asked by this person.

SA A U D SD This person would be able to complete college.

SA A U D SD This person is independent.

SA A U D SD I feel sorry for this person.

SA A U D SD I would prefer not to talk with this person.

SA A U D SD This person doesn't have a good social life.

SA A U D SD Nonspeaking persons are usually friendly.

SA A U D SD People who are nonspeaking should not have to pay income taxes.

SA A U D SD Nonspeaking persons are no more emotional than other people.

SA A U D SD Nonspeaking persons can have a normal social life.

SA A U D SD Most nonspeaking persons have a chip on their shoulder.

SA A U D SD Nonspeaking workers can be as successful as other workers.

SA A U D SD Very few nonspeaking persons are ashamed of their disability.

SA A U D SD Most people feel uncomfortable when they associate with nonspeaking persons.

SA A U D SD Nonspeaking persons show less enthusiasm than speaking person.

SA A U D SD Nonspeaking persons do not become upset any more easily than non-disabled persons.

SA A U D SD Nonspeaking persons are often less aggressive than normal people.

SA A U D SD Most nonspeaking persons get married and have children.

SA A U D SD Most nonspeaking persons do not worry any more than anyone else.

SA A U D SD Employers should not be allowed to fire nonspeaking employees.

SA A U D SD Nonspeaking people are as happy as non-disabled persons.

SA A U D SD Nonspeaking people are harder to get along with than are those with minor disabilities.

SA A U D SD Most nonspeaking people expect special treatment.

SA A U D SD Nonspeaking persons should expect to lead a normal life.

SA A U D SD Nonspeaking persons tend to get discouraged easily.

SA A U D SD The worst thing that could happen to a person would be for him/her to be very severely injured.

SA A U D SD Nonspeaking children should not have to compete with speaking children.

SA A U D SD Most nonspeaking people do not feel sorry for themselves.

SA A U D SD Most nonspeaking people prefer to work with other disabled people.

SA A U D SD Most nonspeaking people are just as ambitious as other people.

SA A U D SD Nonspeaking persons are not as self-confident as normal speaking persons.

SA A U D SD Most nonspeaking persons don't want more affection and praise than other people.

SA A U D SD It would be best if a nonspeaking person would marry another disabled person.

SA A U D SD Most nonspeaking people do not need special attention.

SA A U D SD Nonspeaking persons want sympathy more than other people.

SA A U D SD Most nonspeaking persons have personalities that are similar to those of normal persons.

Thank you very much for your participation.

APPENDIX E

Experimental Scale
Attitudes Toward Non-Speaking Persons Scale

Below you will find a number of statements. The words, this person refer to the person in the wheelchair on the videotape. Please answer all of the questions by circling your choice on the scales provided for each question. Base your answer on your own beliefs and behavior. Indicate whether you Strongly Agree (SA), Agree (A), are Undecided (U), Disagree (D), or Strongly Disagree (SD) with each statement.

SA A U D SD I would study (for a class) with this person.

SA A U D SD I respect this person.

SA A U D SD I do not feel sorry for this person.

SA A U D SD This person is not intelligent.

SA A U D SD This person would be easy to talk to.

SA A U D SD This person is not capable of giving a short speech to a class.

SA A U D SD I would help this person with a task such as purchasing something.

SA A U D SD This person is trustworthy.

SA A U D SD This person won't make a contribution to society.

SA A U D SD This person understands what people say.

SA A U D SD This person is sociable.

SA A U D SD I do not feel any sympathy for this person.

SA A U D SD I would feel uncomfortable with this person.

SA A U D SD I would feel inhibited with this person.

SA A U D SD I would not trust this person.

SA A U D SD This type of person would not be able to complete high school.

SA A U D SD You should not expect too much from this person.

SA A U D SD This person is as self-confident as other people.

SA A U D SD I would help this person obtain someone's attention.

SA A U D SD I would feel anxious around this person.

SA A U D SD This person would be successful in a job.

SA A U D SD This type of person is mentally handicapped.

SA A U D SD This person should expect to lead a normal life.

SA A U D SD I would feel uncomfortable answering questions asked by this person.

SA A U D SD This person would be able to complete college.

SA A U D SD This person is independent.

SA A U D SD I feel sorry for this person.

SA A U D SD I would prefer not to talk with this person.

SA A U D SD This person doesn't have a good social life.

I have had direct contact with physically disabled persons (such as working or living with them). Check one.

_____ YES

_____ NO

If YES, please briefly describe:_____

_____

LIST OF REFERENCES

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FOOTNOTES

[1] Bureau for Education of the Handicapped Conference on Communication Aids for the Non-Vocal Severely Physically Handicapped Person, December 7-8, 1976, Alexandria, Virginia.

[2] This investigation did not explicitly examine whether a technological communication aid <u>with</u> voice synthesis output versus a technolgical aid <u>without</u> synthesis had an effect on attitude formation. Although future research examining this variable would be valuable, implications drawn from this investigation should reflect only that a sophisticated technological aid such as a VOCA had an effect on attitude favorability.