

CHAPTER 2

THE IMPACT OF VOICE OUTPUT ON THE ATTITUDES OF PEERS

2.1 INTRODUCTION

It is universally accepted that attitudes determine with whom, about what, where and how individuals interact with others. This profound effect of attitudes on interactions highlights the need to determine the attitudes of non-disabled peers to the disabled, including those with LNFS.

In this chapter the important influence of peer attitudes on their behaviour and interaction with disabled children, including those with LNFS, is discussed. A theoretical model of attitudes, the ABC model, is presented. This is followed by a discussion on the negative influence of stereotypical attitudes and on strategies to reduce stereotyping. The significance of communication partners and the interaction patterns of AAC users with peers are discussed.

The research findings on the impact of the output means of AAC devices, including voice output, are described and compared. A summary of conflicting research findings with respect to the influence of the output mode of devices, specifically voice output, is presented. The chapter concludes with an evaluation of the attitude scales used by previous researchers to compare peer attitudes to children using various AAC devices. The necessity for the development of a new measure is highlighted.

2.2 ATTITUDES TO THE DISABLED

Extensive research findings substantiate generally negative attitudes toward disabled persons as well as the modification of the social behaviour of non-disabled when in the presence of disabled peers (Bender 1980; Fiedler & Simpson 1987; King, Rosenbaum, Armstrong & Milner 1989; Warrick 1988). More specifically, negative attitudes of non-disabled children to peers with speech disorders were found to be prevalent (McKinnon, Hess & Landry 1986; Lass, Ruscello, Bradshaw & Blankenship 1991; Kalinowski, Lerman & Watt 1991; Williams & Dietrich 1996). Attitudes of children to the disabled are often culturally derived, therefore, learned and

stereotypic. Modified social behaviours include reduced eye contact, shortened interaction time and decreased verbal communication. These attitudes and resultant behaviours are barriers to peers' communication with children who have disabilities. There is a need to understand how attitudes can be made more positive in order to facilitate positive interaction.

2.3 THE EFFECT OF ATTITUDES ON BEHAVIOUR

Attitudes influence behaviour. They predispose adults and children to respond to a person, object, situation or abstract issue in a favourable or unfavourable way. The ABC model of attitudes provides a theoretical construct appropriate to an understanding of children's attitudes to peers who are users of AAC devices. The model suggests that any attitude has three interrelated elements, namely an affective, a behavioural and a cognitive component (Feldman 1993). The affective component comprises the emotional feeling, whether positive or negative, the behavioural component is the predisposition to act in a way that is relevant to an attitude, and the cognitive component refers to the thoughts and beliefs relative to the attitude. Every attitude an individual has consists of all three components but in varying degrees of prevalence (Feldman 1993). Whereas individuals are always aware of the opinions they hold which are more specific and factually based, attitudes, of which an individual may not be fully conscious, are essentially revealed by behavioural responses to a person, situation or issue (Aitkin 1996).

Although the potency of the link between an attitude and the resultant behaviour does vary, people generally endeavour to maintain consistency between their attitudes and behaviour, which form a logical behavioural framework (Feldman 1993). Researchers in the field of social cognition – the study of the mental processes by which we understand, process information, and make judgements and decisions about our social world – have determined that adults and children develop complex schemas about people and social experiences. These schemas regulate information and memories and provide a framework for categorising and interpreting social stimuli (Feldman 1993).

Individuals typically have schemas for different people in their environment and they organise, recall and even predict what others are like on the basis of relatively little information. Vocal characteristics strongly influence the opinion and reaction of peers to one another (McKinnon *et al.* 1986). Because individuals tend to fit people into schemas even when there is little definite evidence to do so, inaccurate and oversimplified understanding of others results. Unfortunately,

therefore, although schemas can be helpful in assisting individuals to organise their social world, they have a negative side – stereotyping (Feldman 1993).

A stereotype is a schema in which beliefs and expectations about members of a group are held simply on the basis of their membership of that group. Individuals tend to hold less favourable opinions about groups to which they do not belong and more positive opinions about groups to which they do belong. This is referred to as ingroup-outgroup bias. It is for this reason that individuals develop negative attitudes to minority groups, including the disabled (Wilder in Feldman (1993). When individuals act on their stereotypes, negative consequences result including changed social behaviour, prejudice and discrimination. It is widely recognised that society's rejecting attitudes to people with disabilities result in restricted social, educational and vocational opportunities for people with disabilities.

2.4 STRATEGIES TO REDUCE STEREOTYPING

Techniques and strategies to reduce the negative effects of stereotyping and negative attitudes towards the disabled by peers have been extensively researched (Donaldson 1980; Gorenflo & Gorenflo 1991; Home 1985; Kraat 1986; Towfighy-Hooshyar & Zingle 1984; Voeltz 1980). The following have been found to be effective:

- Increasing the quality and length of contact between the disabled and peers in non-threatening environments. Mere exposure to disabled children is not effective in improving peer attitudes as contact has to be interactive and to extend over a prolonged period (Armstrong, Rosenbaum & King 1987). In a study using an attitudinal questionnaire, non-disabled children attending integrated schools and who were more familiar with disabled children were found to have more positive attitudes towards a disabled peer with LNFS than children going to non-integrated schools (Beck & Dennis 1996).
- Interactions where individuals are of equal status, or are required to co-operate, or are dependent on one another, reduce stereotyping (Feldman 1993). Studies of AAC users seldom describe communication between individuals of equal status. Generally, the partners described were familiar to the AAC user and the social relationships of the dyad were usually asymmetric, with the partner being of a higher status (Light 1988). In the school setting, children using AAC are rarely described interacting with their peers, interactions taking place mainly with teachers (Harris 1982). This contention is confirmed

by Kraat (1987) who stated that in most of the interactive research studies of children using aided systems, the children communicated in a dyad with a staff member or caregiver.

- Providing information about the disabled, including those with LNFS. The results of an investigation into the significance of information and AAC technique on attitudes toward individuals with LNFS revealed that additional information concerning the individuals with LNFS had a positive effect on attitudes towards these individuals (Gorenflo & Gorenflo 1991).
- Enhancing positive values. Research studies have demonstrated that the use of high-technology AAC systems enhanced the image of AAC users who were rated as having higher intellectual functioning than previously judged (McCall, Markova, Moodie & Collins 1997). The use of more complex language (phrases versus single words) by an adult AAC user also resulted in a more favourable rating (Hoag, Bedrosian, Johnson & Molineux 1994).

2.5 CHILDREN'S ATTITUDES TO DISABLED PEERS

Children's attitudes to peers with disabilities are multidimensional with several factors having been identified as influencing these attitudes. The importance of the communication competence of children with disabilities, when status is assigned to them by their peers, has been highlighted (Horne 1985). Evidence that minor communication disorders of children result in negative peer attitudes is widespread. A single articulatory defect resulted in teenagers being regarded by peers as having a number of undesirable attributes as well as poor speech (Silverman & Paulus 1989). Voice disorders adversely affected adolescents' and peers' perceptions of specific physical and personality characteristics of children (Lass *et al.* 1991). Speakers with a lisp or stutter were subjected to negative stereotypical attitudes and behaviours and considered socially undesirable (Kalinowsky *et al.* 1991; McKinnon *et al.* 1986).

As it is evident that peers' attitudes to children with communication deficits are generally negative, information regarding the variables that affect peer perceptions of the communicative competence of children who use AAC is urgently required. These variables need to be experimentally verified in order to develop successful intervention strategies (Bedrosian, Hoag, Calculator & Molineux 1992). There is a need to determine whether peers rate a child who uses

an AAC device that produces speech (voice output) as more competent than a child who uses a low technological device with no voice output.

The role of the gender of the peers is also of interest to this study (Hoag *et al.* 1994). It is important to verify whether the finding that girls hold more favourable attitudes to disabled peers than boys (Fiedler & Simpson 1987; Rosenbaum, Armstrong & King 1986; Voeltz 1980), is also accurate for South African children.

2.6 PEER INTERACTION WITH AAC USERS

The interaction between AAC users and peers in terms of the number of communication partners and the status of the non-disabled individual influences the quality of communication. Insufficient interaction between children who use AAC and their peers is well documented as negatively affecting the formation of attitudes (Beukelman & Mirenda 1992; Goossens 1994; Kraat 1987; Lloyd, Fuller & Arvidson 1997). The majority of interactive research studies have described AAC users in interactions with a single partner as opposed to group interactions and with familiar as opposed to unfamiliar communication partners (Light 1988).

However, the effectiveness of the AAC intervention is determined by the child's ability to interact in natural daily environments. For children these include both the classroom and playground where, although some didactic interactions take place, many interactions are group-based. Children using AAC must function effectively from a social perspective if they are to become productive members of society (Light 1988). Research in this area is essential to determine which strategies and techniques contribute to communicative competence from both a personal and social perspective (Light 1988).

Speech output provides a greater range and increased flexibility of communication (Quist & Blischak 1992). Providing a way for the AAC user to gain attention, address groups, interrupt in a noisy environment, and communicate by phone or with a partner who is not literate, are examples of the ways in which a VOCA contributed to the communication competence of the individual with LNFS (Quist & Blischak 1992; Raghavendra & Allen 1993). Studies have also determined that VOCAs are particularly important to AAC users because they result in increased communication interactions in specific settings (Schepis & Reid 1995).

The use of a VOCA allowed an AAC user with severe disabilities to initiate requests that were clearly understood by personnel (Schepsis & Reid 1995). The increase in interactions was still apparent after a prolonged period (Schepsis & Reid 1995). Additional research is recommended to determine the effect of voice output on the attitudes and interactions of unfamiliar communication partners in various community environments (Schepsis & Reid 1995).

The importance of the communication partner or partners in determining the success or failure of the interactions of AAC users has been emphasised by many researchers (Bedrosian *et al.* 1992; Kraat 1987; Light 1988). In addition, the effects of the communicative behaviours, of both the AAC user and the partner, on the perceptions of 'other peers' in the environment must be considered (Bedrosian *et al.* (1992). This is particularly relevant to how the communicative competence of the AAC user is rated by the 'other peers'.

There is evidence that the communication device itself may have a significant effect on the attitude of the partner and his or her willingness to interact with the user (Bedrosian *et al.* 1992; Gorenflo & Gorenflo 1991; O'Keefe, Brown & Schuller 1998). The manner in which a device improves or diminishes the speaking partner's perception of the user is of special interest (Higginbotham 1989; Schepsis & Reid 1995). The use of computer (high) technology for communication has been found to affect the attitudes of peers positively, and in some way indicated greater intelligence of the user (Alm in Blockberger, Armstrong, O'Connor & Freeman 1993). Results of a study to assess the attitudes of undergraduate college students toward a peer with physical disabilities and LNFS indicated that as the communication technique became more sophisticated, evaluations of the peer with LNFS became more favourable (Gorenflo & Gorenflo 1991). Should the aided message be highly intelligible, reflect the intelligence, age and gender of the user as well as being socially appropriate, the user is more likely to be considered favourably by peers (O'Keefe *et al.* 1998). A high-technological AAC device with suitable voice output is most likely to meet these criteria.

2.7 THE IMPACT OF OUTPUT MEANS OF DEVICES ON ATTITUDES

Research findings on the impact of the output means of devices on the perceptions of speaking partners are contradictory. Careful consideration of the significant influence of output mode on peers is essential as the perceptions of speaking partners directly affect their attitudes to

device users and their intention to engage in conversational interactions with them. Attitude ratings by unfamiliar listeners were significantly lower when print output, as opposed to synthetic speech or LCD display, was used by the AAC users (Coxson & Mathy-Laikko 1983).

In contrast to the latter finding, when individuals with LNFS used communication boards compared to VOCAs, partners rated communication as faster and more readily understood. This was despite the fact that one of the subjects indicated that he preferred the voice output device as it increased his independence (Buzolich cited by Light 1988). It has also been noted that negative perceptions may result when devices that use synthetic speech are first introduced to unfamiliar partners (Mirenda, Eicher & Beukelman 1989). Research has shown that a VOCA allowed an adolescent AAC user more opportunities to interact with unfamiliar partners (Light, Beesley & Collier 1988).

Interaction patterns of adults with LNFS have been shown to vary as a function of the limitations and strengths of the specific AAC devices (Gorenflo & Gorenflo 1991; Light 1988). More favourable attitudes of non-disabled peers to an AAC user who used a VOCA were supported by research that compared three different systems: unaided voice and gestures; an alphabet board; and a VOCA (Gorenflo & Gorenflo 1991). The results of the latter study supported the hypothesis that attitudes were significantly more favourable toward an individual using a high technological device such as a VOCA and the researchers concluded that voice output independently had a positive effect on attitudes to persons with LNFS (Gorenflo & Gorenflo 1991). Researchers suggested that devices with voice output should be selected to increase favourable attitudes to AAC users and that variables such as the quality and type of synthetic voice should be further investigated to establish the effect of these variables on attitudes to AAC device users (Gorenflo & Gorenflo 1991).

Children and adults have also been shown to respond differently to output mode. Whereas children preferred computers with synthesised speech, even if it was less intelligible than recorded speech, adults preferred more natural sounding speech (Mirenda *et al.* 1989). Gender differences are also apparent, as female listeners have been shown to respond differently from male listeners (Mirenda *et al.* 1989). Both adult women and girls considered the gender appropriateness of speech output to be the prime factor for acceptability. Male listeners also favoured female voices for women and girls but were more flexible with respect to gender appropriateness for themselves (Mirenda *et al.* 1989).

Researchers, clinicians and users have shown increasing interest in the intelligibility and other features of the synthetic speech output of VOCAs (Bedrosian *et al.* 1992; Hoag & Bedrosian 1992; Kraat 1986; Mirenda *et al.* 1989). The rate and loudness, gender and age appropriateness of the synthetic speech all have a cumulative impact on the attitudes and reactions of unfamiliar and familiar partners (Mirenda *et al.* 1989). Researchers have also highlighted the importance of additional features of quality, prosody and the naturalness of the voice output in influencing the perceptions of the AAC user by listeners (O'Keefe *et al.* 1998).

2.8 CHILDREN'S ATTITUDES TO PEERS WHO USE AAC DEVICES

It is essential to explore the variables that influence peer attitudes to children with LNFS as results may well differ from those of adults and adolescents. Children's reactions to physical disabilities are reportedly not as differentiated as the reactions of adults (Blockberger *et al.* 1993). Research has indicated that children's attitudes to disabled peers have an age-related sequential pattern (Ryan in Morrison & Ursprung 1990). Children, aged 4 – 6 years, are generally found to be rejecting of peers with physical disabilities whereas older children, 7 – 10 years of age, are less rejecting (Morrison & Ursprung 1990). Different developmental influences, education and experience with disabled peers will affect the attitudes of individual children to disabled peers with LNFS.

The following two studies are closely related to the current study and are therefore presented in greater detail. Blockberger *et al.* (1993) conducted research to explore peer attitudes toward a child with LNFS. The purpose of their study was to ascertain whether the AAC technique used influenced the attitudes of the unfamiliar peers towards the child with disabilities and LNFS (Blockberger *et al.* 1993). The subject of their study, a nine-year old girl, was videotaped having a scripted conversation with a Speech Therapist using unaided AAC techniques, an alphabet board, and a VOCA. Participants, unfamiliar peers from nine different schools, viewed one of the three videotapes in their class groups before they completed the Chedoke-McMaster Attitudes Towards Children with Handicaps Scale (CATCH) (Blockberger *et al.* 1993).

The CATCH was developed in 1986 by Rosenbaum, Armstrong and King to provide a reliable measure for the study of attitudes of children aged 9 – 13 years, toward disabled peers (Rosenbaum *et al.* 1987). The researchers expected to find that more favourable attitudes

would be evident towards the child using the more high technological aid, the VOCA, than to the child using the alphabet board or the unaided techniques (Blockberger *et al.* 1993). However, the AAC technique used had no impact on attitudes, as measured by the CATCH (Blockberger *et al.* 1993).

The researchers suggested two possible directions for future research on the perceptions and initial attitudes by peers toward the child with LNFS: namely, consideration of the interaction between the AAC technique used and other factors e.g. the physical appearance of the user; and investigation into the effect of the AAC technique used on the actual behaviours of peers when interacting with a child with LNFS in natural settings (Blockberger *et al.* 1993).

Beck and Dennis (1996) investigated the attitudes of non-disabled children toward children who had disabilities and used AAC systems. The main focus of their research was whether self-reported attitudes of children without disabilities towards a child who uses AAC varied according to whether the child used an alphabet board or a VOCA. The participants in their study were randomly assigned to watch a videotape of a disabled child using either the non-electronic alphabet board or the VOCA. Participants then completed the CATCH. The results of the research by Beck and Dennis (1996) indicated that there was no difference in scores on the CATCH between those viewing the child using the alphabet board or the VOCA. Their data did not support the earlier research of Gorenflo & Gorenflo (1991) or their prediction that peers would view a child using a high-technology VOCA more positively than a child using the non-electronic alphabet board.

The results of the research did, however, support their hypothesis that girls would view the disabled peer more positively than boys. One possible explanation Beck & Dennis (1996) suggest for the fact that there was no discernible effect of the different AAC techniques on attitudes was that the CATCH might not be sensitive to these differences. They suggested that future research include the development of a scale designed to measure subtle differences in children's attitudes to AAC users (Beck & Dennis 1996).

2.9 AAC USERS' ATTITUDES TO VOICE OUTPUT

The views of AAC users, on whether voice output has an effect on their interactions with others, were elicited by the researcher through the medium of the ACOLUG listserv on the Internet. Significantly, only responses validating the positive influence of voice output were received. AAC users cited definite advantages of voice output in terms of increased opportunities for interaction as well as positive effects on interactions. They expressed the fact that having a disability and LNFS led to extreme isolation and that voice output provided a natural, typical means of communication that had advantages over other methods of augmented communication such as the use of communication boards (Spivey 1998; Merchen 1998). The disadvantages of using communication boards, without voice output, were that potential communication partners needed to recognise, know, understand and even facilitate the use of the communication system being used (Spivey 1998).

The tendency of people to avoid situations they did not know or understand increased isolation of the person using an unfamiliar AAC system and the lack of voice output of communication boards was reflected as a restriction in communication with peers. Provision of voice output was described as being the most meaningful and functional form of AAC (McMaster 1998; Spivey 1998).

The provision of a voice output device was credited with allowing users to develop deeper, richer relationships with both familiar communication partners and unfamiliar people in the community. Voice output was perceived as allowing the users to express their personalities and their sense of humour (McMaster 1998; Merchen 1998). Additional benefits listed included the ability to communicate with people in another room, with the visually impaired and with the very young. The ease and immediacy of the partner to receive a message via voice output was compared to the effort and time involved in a partner 'reading' a communication board. The latter was felt to result in the loss of time dependent messages (such as quips of humour) which increase the intimacy of the communicative interaction (McMaster 1998). Users argued that the provision of voice output increased their independence and improved their ability to approach strangers and make friends. Additionally, voice output was credited with improving the confidence and self-image of users (Merchen 1998).

2.10 THE MEASUREMENT OF ATTITUDES

Attitudes are difficult to measure accurately and researchers have developed and employed many different techniques in attempting to quantify attitudinal responses. Semantic differential scales composed of a varied number of bipolar adjective pairs have been used extensively in research related to speech and communication (McKinnon *et al.* 1986; Lass, Ruscello & Lakawitz 1988; Lass *et al.* 1991; Kalinowski *et al.* 1991; Silverman & Paulus 1996 and Williams & Dietrich 1996). With sequential differential scales, research participants mark one of an unequal number of points along an assumed equal-interval scale to best describe a trait of the subject under evaluation. This involves a strongly judgmental process to elicit connotative evaluations of participants. Numbers of items included in scales varied from as few as nine trait pairs in the Williams & Dietrich (1996) study to as many as 81 in the Silverman & Paulus (1989) study. Wording of adjective pairs varied from simple e.g. dirty-clean, sad-happy, poor-rich, bad-good to complex e.g. soothing-aggravating, realistic-idealistic, dominant-submissive (Lass *et al.* 1991; Silverman & Paulus 1989).

Researchers studying the perceptions and attitudes of adults and children toward AAC users have used Likert-type attitudinal questionnaires and rating scales. (Hoag *et al.* 1994; Bedrosian *et al.* 1992; Beck & Dennis 1999; Gorenflo & Gorenflo 1991; Gorenflo & Gorenflo 1997). The following two attitudinal scales were used with adults: The Attitudes Toward Nonspeaking Persons Scale (ATNP) and The Attitudes Towards Disabled Persons Scale (ATDP), while the CATCH scale was used with children.

The CATCH scale was based on the theoretical construct of attitudes having an affective, a behavioural and a cognitive (belief) component (Rosenbaum *et al.* 1996). However, factor analysis indicated that a two component model was more appropriate, namely affective/behavioural and cognitive. This is supported by the fact that one's intent to act is synonymous with one's emotion about the action (Rosenbaum *et al.* 1996). Likewise, factor analysis of the ATNP indicated two meaningful attitudinal factors, a '*general evaluation*' corresponding to the cognitive component, and the '*interactive/affective*' factor corresponding to the affective/behavioural component of the CATCH (Gorenflo & Gorenflo 1991).

The CATCH scale was developed to measure children's attitudes to 'handicapped peers' (Beck & Dennis 1996). The sensitivity of the CATCH scale to measure possible differences in peer

attitudes to children who use different AAC devices has been questioned (Beck and Dennis 1996).

The questionnaire used by Bedrosian *et al.* (1992) was developed specifically to assess the perceived communicative competence of AAC users. The final questionnaire, a Likert-type scale, consisted of 30 items which was used with adults (Bedrosian *et al.* 1992; Hoag & Bedrosian 1992; Hoag *et al.* 1994).

2.11 COMPARISON OF ATTITUDINAL STUDIES TO AAC USERS

For greater clarity and ease of comparison, particular objectives, methodological issues, research findings and recommendations of attitudinal studies toward AAC users are presented in Tables 2.1 and 2.2.

by Kraat (1987) who stated that in most of the interactive research studies of children using aided systems, the children communicated in a dyad with a staff member or caregiver.

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would be evident towards the child using the more high technological aid, the VOCA, than to the child using the alphabet board or the unaided techniques (Blockberger *et al.* 1993). However, the AAC technique used had no impact on attitudes, as measured by the CATCH (Blockberger *et al.* 1993).

The researchers suggested two possible directions for future research on the perceptions and initial attitudes by peers toward the child with LNFS: namely, consideration of the interaction between the AAC technique used and other factors e.g. the physical appearance of the user; and investigation into the effect of the AAC technique used on the actual behaviours of peers when interacting with a child with LNFS in natural settings (Blockberger *et al.* 1993).

Beck and Dennis (1996) investigated the attitudes of non-disabled children toward children who had disabilities and used AAC systems. The main focus of their research was whether self-reported attitudes of children without disabilities towards a child who uses AAC varied according to whether the child used an alphabet board or a VOCA. The participants in their study were randomly assigned to watch a videotape of a disabled child using either the non-electronic alphabet board or the VOCA. Participants then completed the CATCH. The results of the research by Beck and Dennis (1996) indicated that there was no difference in scores on the CATCH between those viewing the child using the alphabet board or the VOCA. Their data did not support the earlier research of Gorenflo & Gorenflo (1991) or their prediction that peers would view a child using a high-technology VOCA more positively than a child using the non-electronic alphabet board.

The results of the research did, however, support their hypothesis that girls would view the disabled peer more positively than boys. One possible explanation Beck & Dennis (1996) suggest for the fact that there was no discernible effect of the different AAC techniques on attitudes was that the CATCH might not be sensitive to these differences. They suggested that future research include the development of a scale designed to measure subtle differences in children's attitudes to AAC users (Beck & Dennis 1996).

2.9 AAC USERS' ATTITUDES TO VOICE OUTPUT

The views of AAC users, on whether voice output has an effect on their interactions with others, were elicited by the researcher through the medium of the ACOLUG listserv on the Internet. Significantly, only responses validating the positive influence of voice output were received. AAC users cited definite advantages of voice output in terms of increased opportunities for interaction as well as positive effects on interactions. They expressed the fact that having a disability and LNFS led to extreme isolation and that voice output provided a natural, typical means of communication that had advantages over other methods of augmented communication such as the use of communication boards (Spivey 1998; Merchen 1998). The disadvantages of using communication boards, without voice output, were that potential communication partners needed to recognise, know, understand and even facilitate the use of the communication system being used (Spivey 1998).

The tendency of people to avoid situations they did not know or understand increased isolation of the person using an unfamiliar AAC system and the lack of voice output of communication boards was reflected as a restriction in communication with peers. Provision of voice output was described as being the most meaningful and functional form of AAC (McMaster 1998; Spivey 1998).

The provision of a voice output device was credited with allowing users to develop deeper, richer relationships with both familiar communication partners and unfamiliar people in the community. Voice output was perceived as allowing the users to express their personalities and their sense of humour (McMaster 1998; Merchen 1998). Additional benefits listed included the ability to communicate with people in another room, with the visually impaired and with the very young. The ease and immediacy of the partner to receive a message via voice output was compared to the effort and time involved in a partner 'reading' a communication board. The latter was felt to result in the loss of time dependent messages (such as quips of humour) which increase the intimacy of the communicative interaction (McMaster 1998). Users argued that the provision of voice output increased their independence and improved their ability to approach strangers and make friends. Additionally, voice output was credited with improving the confidence and self-image of users (Merchen 1998).

2.10 THE MEASUREMENT OF ATTITUDES

Attitudes are difficult to measure accurately and researchers have developed and employed many different techniques in attempting to quantify attitudinal responses. Semantic differential scales composed of a varied number of bipolar adjective pairs have been used extensively in research related to speech and communication (McKinnon *et al.* 1986; Lass, Ruscello & Lakawitz 1988; Lass *et al.* 1991; Kalinowski *et al.* 1991; Silverman & Paulus 1996 and Williams & Dietrich 1996). With sequential differential scales, research participants mark one of an unequal number of points along an assumed equal-interval scale to best describe a trait of the subject under evaluation. This involves a strongly judgmental process to elicit connotative evaluations of participants. Numbers of items included in scales varied from as few as nine trait pairs in the Williams & Dietrich (1996) study to as many as 81 in the Silverman & Paulus (1989) study. Wording of adjective pairs varied from simple e.g. dirty-clean, sad-happy, poor-rich, bad-good to complex e.g. soothing-aggravating, realistic-idealistic, dominant-submissive (Lass *et al.* 1991; Silverman & Paulus 1989).

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The CATCH scale was based on the theoretical construct of attitudes having an affective, a behavioural and a cognitive (belief) component (Rosenbaum *et al.* 1996). However, factor analysis indicated that a two component model was more appropriate, namely affective/behavioural and cognitive. This is supported by the fact that one's intent to act is synonymous with one's emotion about the action (Rosenbaum *et al.* 1996). Likewise, factor analysis of the ATNP indicated two meaningful attitudinal factors, a '*general evaluation*' corresponding to the cognitive component, and the '*interactive/affective*' factor corresponding to the affective/behavioural component of the CATCH (Gorenflo & Gorenflo 1991).

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attitudes to children who use different AAC devices has been questioned (Beck and Dennis 1996).

The questionnaire used by Bedrosian *et al.* (1992) was developed specifically to assess the perceived communicative competence of AAC users. The final questionnaire, a Likert-type scale, consisted of 30 items which was used with adults (Bedrosian *et al.* 1992; Hoag & Bedrosian 1992; Hoag *et al.* 1994).

2.11 COMPARISON OF ATTITUDINAL STUDIES TO AAC USERS

For greater clarity and ease of comparison, particular objectives, methodological issues, research findings and recommendations of attitudinal studies toward AAC users are presented in Tables 2.1 and 2.2.

2.12 SUMMARY

The anecdotal evidence of users, experience of clinicians and the research of Gorenflo & Gorenflo (1991) as well as Schepsis & Reid (1995) support the hypothesis that voice output will have a positive effect on the attitudes of peers to a disabled child who uses an AAC device.

Conversely, the research of Blockberger *et al.* (1993) and Beck & Dennis (1996) suggests the output mode of the AAC device used by a disabled child with LNFS was not associated with a difference in peer attitudes. Further research is thus required to determine the impact of voice output, as a characteristic of a child's AAC system, on the attitudes of unfamiliar peers.

The questionnaires used to determine adults' attitudes to AAC users (ATNP, the ATDP and the communication competence questionnaire of Bedrosian *et al.* 1992) were not considered to be totally suitable for use by children. Likewise, the sensitivity of the CATCH, which was developed for a more general purpose, was queried in terms of its suitability for differentiating attitudes towards various AAC techniques used by children. Thus, there is a need to develop a suitable tool to measure the attitudes of peers to a child with disabilities including LNFS, including measuring the peers' evaluation of the AAC user's communicative competence.

This investigation, therefore, also included an attempt to design an attitude scale to measure adequately any difference in attitudes toward children who are AAC users, dependent on the output mode of the devices used.

CHAPTER 2

THE IMPACT OF VOICE OUTPUT ON THE ATTITUDES OF PEERS

2.1 INTRODUCTION

It is universally accepted that attitudes determine with whom, about what, where and how individuals interact with others. This profound effect of attitudes on interactions highlights the need to determine the attitudes of non-disabled peers to the disabled, including those with LNFS.

In this chapter the important influence of peer attitudes on their behaviour and interaction with disabled children, including those with LNFS, is discussed. A theoretical model of attitudes, the ABC model, is presented. This is followed by a discussion on the negative influence of stereotypical attitudes and on strategies to reduce stereotyping. The significance of communication partners and the interaction patterns of AAC users with peers are discussed.

The research findings on the impact of the output means of AAC devices, including voice output, are described and compared. A summary of conflicting research findings with respect to the influence of the output mode of devices, specifically voice output, is presented. The chapter concludes with an evaluation of the attitude scales used by previous researchers to compare peer attitudes to children using various AAC devices. The necessity for the development of a new measure is highlighted.

2.2 ATTITUDES TO THE DISABLED

Extensive research findings substantiate generally negative attitudes toward disabled persons as well as the modification of the social behaviour of non-disabled when in the presence of disabled peers (Bender 1980; Fiedler & Simpson 1987; King, Rosenbaum, Armstrong & Milner 1989; Warrick 1988). More specifically, negative attitudes of non-disabled children to peers with speech disorders were found to be prevalent (McKinnon, Hess & Landry 1986; Lass, Ruscello, Bradshaw & Blankenship 1991; Kalinowski, Lerman & Watt 1991; Williams & Dietrich 1996). Attitudes of children to the disabled are often culturally derived, therefore, learned and

stereotypic. Modified social behaviours include reduced eye contact, shortened interaction time and decreased verbal communication. These attitudes and resultant behaviours are barriers to peers' communication with children who have disabilities. There is a need to understand how attitudes can be made more positive in order to facilitate positive interaction.

2.3 THE EFFECT OF ATTITUDES ON BEHAVIOUR

Attitudes influence behaviour. They predispose adults and children to respond to a person, object, situation or abstract issue in a favourable or unfavourable way. The ABC model of attitudes provides a theoretical construct appropriate to an understanding of children's attitudes to peers who are users of AAC devices. The model suggests that any attitude has three interrelated elements, namely an affective, a behavioural and a cognitive component (Feldman 1993). The affective component comprises the emotional feeling, whether positive or negative, the behavioural component is the predisposition to act in a way that is relevant to an attitude, and the cognitive component refers to the thoughts and beliefs relative to the attitude. Every attitude an individual has consists of all three components but in varying degrees of prevalence (Feldman 1993). Whereas individuals are always aware of the opinions they hold which are more specific and factually based, attitudes, of which an individual may not be fully conscious, are essentially revealed by behavioural responses to a person, situation or issue (Aitkin 1996).

Although the potency of the link between an attitude and the resultant behaviour does vary, people generally endeavour to maintain consistency between their attitudes and behaviour, which form a logical behavioural framework (Feldman 1993). Researchers in the field of social cognition – the study of the mental processes by which we understand, process information, and make judgements and decisions about our social world – have determined that adults and children develop complex schemas about people and social experiences. These schemas regulate information and memories and provide a framework for categorising and interpreting social stimuli (Feldman 1993).

Individuals typically have schemas for different people in their environment and they organise, recall and even predict what others are like on the basis of relatively little information. Vocal characteristics strongly influence the opinion and reaction of peers to one another (McKinnon *et al.* 1986). Because individuals tend to fit people into schemas even when there is little definite evidence to do so, inaccurate and oversimplified understanding of others results. Unfortunately,

therefore, although schemas can be helpful in assisting individuals to organise their social world, they have a negative side – stereotyping (Feldman 1993).

A stereotype is a schema in which beliefs and expectations about members of a group are held simply on the basis of their membership of that group. Individuals tend to hold less favourable opinions about groups to which they do not belong and more positive opinions about groups to which they do belong. This is referred to as ingroup-outgroup bias. It is for this reason that individuals develop negative attitudes to minority groups, including the disabled (Wilder in Feldman (1993). When individuals act on their stereotypes, negative consequences result including changed social behaviour, prejudice and discrimination. It is widely recognised that society's rejecting attitudes to people with disabilities result in restricted social, educational and vocational opportunities for people with disabilities.

2.4 STRATEGIES TO REDUCE STEREOTYPING

Techniques and strategies to reduce the negative effects of stereotyping and negative attitudes towards the disabled by peers have been extensively researched (Donaldson 1980; Gorenflo & Gorenflo 1991; Home 1985; Kraat 1986; Towfighy-Hooshyar & Zingle 1984; Voeltz 1980). The following have been found to be effective:

- Increasing the quality and length of contact between the disabled and peers in non-threatening environments. Mere exposure to disabled children is not effective in improving peer attitudes as contact has to be interactive and to extend over a prolonged period (Armstrong, Rosenbaum & King 1987). In a study using an attitudinal questionnaire, non-disabled children attending integrated schools and who were more familiar with disabled children were found to have more positive attitudes towards a disabled peer with LNFS than children going to non-integrated schools (Beck & Dennis 1996).
- Interactions where individuals are of equal status, or are required to co-operate, or are dependent on one another, reduce stereotyping (Feldman 1993). Studies of AAC users seldom describe communication between individuals of equal status. Generally, the partners described were familiar to the AAC user and the social relationships of the dyad were usually asymmetric, with the partner being of a higher status (Light 1988). In the school setting, children using AAC are rarely described interacting with their peers, interactions taking place mainly with teachers (Harris 1982). This contention is confirmed

by Kraat (1987) who stated that in most of the interactive research studies of children using aided systems, the children communicated in a dyad with a staff member or caregiver.

- Providing information about the disabled, including those with LNFS. The results of an investigation into the significance of information and AAC technique on attitudes toward individuals with LNFS revealed that additional information concerning the individuals with LNFS had a positive effect on attitudes towards these individuals (Gorenflo & Gorenflo 1991).
- Enhancing positive values. Research studies have demonstrated that the use of high-technology AAC systems enhanced the image of AAC users who were rated as having higher intellectual functioning than previously judged (McCall, Markova, Moodie & Collins 1997). The use of more complex language (phrases versus single words) by an adult AAC user also resulted in a more favourable rating (Hoag, Bedrosian, Johnson & Molineux 1994).

2.5 CHILDREN'S ATTITUDES TO DISABLED PEERS

Children's attitudes to peers with disabilities are multidimensional with several factors having been identified as influencing these attitudes. The importance of the communication competence of children with disabilities, when status is assigned to them by their peers, has been highlighted (Horne 1985). Evidence that minor communication disorders of children result in negative peer attitudes is widespread. A single articulatory defect resulted in teenagers being regarded by peers as having a number of undesirable attributes as well as poor speech (Silverman & Paulus 1989). Voice disorders adversely affected adolescents' and peers' perceptions of specific physical and personality characteristics of children (Lass *et al.* 1991). Speakers with a lisp or stutter were subjected to negative stereotypical attitudes and behaviours and considered socially undesirable (Kalinowsky *et al.* 1991; McKinnon *et al.* 1986).

As it is evident that peers' attitudes to children with communication deficits are generally negative, information regarding the variables that affect peer perceptions of the communicative competence of children who use AAC is urgently required. These variables need to be experimentally verified in order to develop successful intervention strategies (Bedrosian, Hoag, Calculator & Molineux 1992). There is a need to determine whether peers rate a child who uses

an AAC device that produces speech (voice output) as more competent than a child who uses a low technological device with no voice output.

The role of the gender of the peers is also of interest to this study (Hoag *et al.* 1994). It is important to verify whether the finding that girls hold more favourable attitudes to disabled peers than boys (Fiedler & Simpson 1987; Rosenbaum, Armstrong & King 1986; Voeltz 1980), is also accurate for South African children.

2.6 PEER INTERACTION WITH AAC USERS

The interaction between AAC users and peers in terms of the number of communication partners and the status of the non-disabled individual influences the quality of communication. Insufficient interaction between children who use AAC and their peers is well documented as negatively affecting the formation of attitudes (Beukelman & Mirenda 1992; Goossens 1994; Kraat 1987; Lloyd, Fuller & Arvidson 1997). The majority of interactive research studies have described AAC users in interactions with a single partner as opposed to group interactions and with familiar as opposed to unfamiliar communication partners (Light 1988).

However, the effectiveness of the AAC intervention is determined by the child's ability to interact in natural daily environments. For children these include both the classroom and playground where, although some didactic interactions take place, many interactions are group-based. Children using AAC must function effectively from a social perspective if they are to become productive members of society (Light 1988). Research in this area is essential to determine which strategies and techniques contribute to communicative competence from both a personal and social perspective (Light 1988).

Speech output provides a greater range and increased flexibility of communication (Quist & Blischak 1992). Providing a way for the AAC user to gain attention, address groups, interrupt in a noisy environment, and communicate by phone or with a partner who is not literate, are examples of the ways in which a VOCA contributed to the communication competence of the individual with LNFS (Quist & Blischak 1992; Raghavendra & Allen 1993). Studies have also determined that VOCAs are particularly important to AAC users because they result in increased communication interactions in specific settings (Schepis & Reid 1995).

The use of a VOCA allowed an AAC user with severe disabilities to initiate requests that were clearly understood by personnel (Schepisis & Reid 1995). The increase in interactions was still apparent after a prolonged period (Schepisis & Reid 1995). Additional research is recommended to determine the effect of voice output on the attitudes and interactions of unfamiliar communication partners in various community environments (Schepisis & Reid 1995).

The importance of the communication partner or partners in determining the success or failure of the interactions of AAC users has been emphasised by many researchers (Bedrosian *et al.* 1992; Kraat 1987; Light 1988). In addition, the effects of the communicative behaviours, of both the AAC user and the partner, on the perceptions of 'other peers' in the environment must be considered (Bedrosian *et al.* (1992). This is particularly relevant to how the communicative competence of the AAC user is rated by the 'other peers'.

There is evidence that the communication device itself may have a significant effect on the attitude of the partner and his or her willingness to interact with the user (Bedrosian *et al.* 1992; Gorenflo & Gorenflo 1991; O'Keefe, Brown & Schuller 1998). The manner in which a device improves or diminishes the speaking partner's perception of the user is of special interest (Higginbotham 1989; Schepisis & Reid 1995). The use of computer (high) technology for communication has been found to affect the attitudes of peers positively, and in some way indicated greater intelligence of the user (Alm in Blockberger, Armstrong, O'Connor & Freeman 1993). Results of a study to assess the attitudes of undergraduate college students toward a peer with physical disabilities and LNFS indicated that as the communication technique became more sophisticated, evaluations of the peer with LNFS became more favourable (Gorenflo & Gorenflo 1991). Should the aided message be highly intelligible, reflect the intelligence, age and gender of the user as well as being socially appropriate, the user is more likely to be considered favourably by peers (O'Keefe *et al.* 1998). A high-technological AAC device with suitable voice output is most likely to meet these criteria.

2.7 THE IMPACT OF OUTPUT MEANS OF DEVICES ON ATTITUDES

Research findings on the impact of the output means of devices on the perceptions of speaking partners are contradictory. Careful consideration of the significant influence of output mode on peers is essential as the perceptions of speaking partners directly affect their attitudes to

device users and their intention to engage in conversational interactions with them. Attitude ratings by unfamiliar listeners were significantly lower when print output, as opposed to synthetic speech or LCD display, was used by the AAC users (Coxson & Mathy-Laikko 1983).

In contrast to the latter finding, when individuals with LNFS used communication boards compared to VOCAs, partners rated communication as faster and more readily understood. This was despite the fact that one of the subjects indicated that he preferred the voice output device as it increased his independence (Buzolich cited by Light 1988). It has also been noted that negative perceptions may result when devices that use synthetic speech are first introduced to unfamiliar partners (Mirenda, Eicher & Beukelman 1989). Research has shown that a VOCA allowed an adolescent AAC user more opportunities to interact with unfamiliar partners (Light, Beesley & Collier 1988).

Interaction patterns of adults with LNFS have been shown to vary as a function of the limitations and strengths of the specific AAC devices (Gorenflo & Gorenflo 1991; Light 1988). More favourable attitudes of non-disabled peers to an AAC user who used a VOCA were supported by research that compared three different systems: unaided voice and gestures; an alphabet board; and a VOCA (Gorenflo & Gorenflo 1991). The results of the latter study supported the hypothesis that attitudes were significantly more favourable toward an individual using a high technological device such as a VOCA and the researchers concluded that voice output independently had a positive effect on attitudes to persons with LNFS (Gorenflo & Gorenflo 1991). Researchers suggested that devices with voice output should be selected to increase favourable attitudes to AAC users and that variables such as the quality and type of synthetic voice should be further investigated to establish the effect of these variables on attitudes to AAC device users (Gorenflo & Gorenflo 1991).

Children and adults have also been shown to respond differently to output mode. Whereas children preferred computers with synthesised speech, even if it was less intelligible than recorded speech, adults preferred more natural sounding speech (Mirenda *et al.* 1989). Gender differences are also apparent, as female listeners have been shown to respond differently from male listeners (Mirenda *et al.* 1989). Both adult women and girls considered the gender appropriateness of speech output to be the prime factor for acceptability. Male listeners also favoured female voices for women and girls but were more flexible with respect to gender appropriateness for themselves (Mirenda *et al.* 1989).

Researchers, clinicians and users have shown increasing interest in the intelligibility and other features of the synthetic speech output of VOCAs (Bedrosian *et al.* 1992; Hoag & Bedrosian 1992; Kraat 1986; Mirenda *et al.* 1989). The rate and loudness, gender and age appropriateness of the synthetic speech all have a cumulative impact on the attitudes and reactions of unfamiliar and familiar partners (Mirenda *et al.* 1989). Researchers have also highlighted the importance of additional features of quality, prosody and the naturalness of the voice output in influencing the perceptions of the AAC user by listeners (O'Keefe *et al.* 1998).

2.8 CHILDREN'S ATTITUDES TO PEERS WHO USE AAC DEVICES

It is essential to explore the variables that influence peer attitudes to children with LNFS as results may well differ from those of adults and adolescents. Children's reactions to physical disabilities are reportedly not as differentiated as the reactions of adults (Blockberger *et al.* 1993). Research has indicated that children's attitudes to disabled peers have an age-related sequential pattern (Ryan in Morrison & Ursprung 1990). Children, aged 4 – 6 years, are generally found to be rejecting of peers with physical disabilities whereas older children, 7 – 10 years of age, are less rejecting (Morrison & Ursprung 1990). Different developmental influences, education and experience with disabled peers will affect the attitudes of individual children to disabled peers with LNFS.

The following two studies are closely related to the current study and are therefore presented in greater detail. Blockberger *et al.* (1993) conducted research to explore peer attitudes toward a child with LNFS. The purpose of their study was to ascertain whether the AAC technique used influenced the attitudes of the unfamiliar peers towards the child with disabilities and LNFS (Blockberger *et al.* 1993). The subject of their study, a nine-year old girl, was videotaped having a scripted conversation with a Speech Therapist using unaided AAC techniques, an alphabet board, and a VOCA. Participants, unfamiliar peers from nine different schools, viewed one of the three videotapes in their class groups before they completed the Chedoke-McMaster Attitudes Towards Children with Handicaps Scale (CATCH) (Blockberger *et al.* 1993).

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Table 2.1 Comparison of Objectives, Participants and Research Subjects of Attitudinal Studies to AAC users.

| STUDIES | OBJECTIVES | VIDEOTAPE PARTICIPANTS | RESEARCH SUBJECTS |
|--|--|---|--|
| The effects of Information and AAC technique on attitudes toward Non-speaking Individuals. Gorenflo & Gorenflo (1991). | <ol style="list-style-type: none"> To determine the effect of 3 communication techniques viz. unaided, alphabet board & VOCA on the attitudes of nondisabled to disabled To measure the effects of information on attitudes of nondisabled to disabled | <ol style="list-style-type: none"> Male, 22 year old, CP quadriplegic with LNFS Female 23 year old SLP graduate student | 151 undergraduate psychology students: 78 male and 73 female |
| Variables Influencing Perceptions of communicative competence of an adult AAC user. Bedrosian et al. (1992). | <ol style="list-style-type: none"> To examine effect of aided message length on perceptions of communicative competence To assess the effect of re-auditorization on perceptions of communicative competence To determine the effect of observer background on perceptions of communicative competence. | <ol style="list-style-type: none"> Male actor played part of a C.P. adult AAC user Male actor played part of nondisabled friend of AAC user. | Group 1- 24 naïve adults, aged 22 -65 yrs 9 male 15 female Group 2 - 24 SLP's aged 24 -47yrs 4 male 20 female |
| Effects of Speech Output Type, Message Length and Reauditorization on perceptions of communicative competence of an Adult AAC user. Hoag & Bedrosian (1992). | <ol style="list-style-type: none"> To examine the effect of speech output type on perceptions of communicative competence To determine the effect of aided message length on perceptions of communicative competence. To assess the effect of re-auditorization by the partner on perceptions of communicative competence. | <ol style="list-style-type: none"> Male actor, in wheelchair played role of AAC user Male actor played role of nondisabled friend of AAC user. (As for above study) | 48 naïve non-disabled adults, aged 20 - 65 yrs 19 male 29 female |
| Variables affecting perceptions of Social aspects of the communicative competence of an adult AAC user. Hoag et al. (1994). | <ol style="list-style-type: none"> To examine the effect of aided message length on perceptions of social aspects of communicative competence To determine the effect of re-auditorization by partner on perceptions of social aspects of communicative competence Assess the effect of observer experience with AAC users on perceptions of social aspects of communicative competence | <ol style="list-style-type: none"> Male actor, in wheelchair played role of AAC user Male actor played role of nondisabled friend of AAC user. (As for Bedrosian et al. 1992 study) | Group 1- 24 naïve adults, aged 22 -65, 9 male 15 female Group 2 - 24 SLP's aged 24 -47years, 4 male 20 female (As for Bedrosian et al. 1992 study) |
| Children's attitudes toward a nonspeaking child using various AAC techniques. Blockberger et al. (1993). | <ol style="list-style-type: none"> To determine if children's attitudes to a peer varied depending on whether the disabled peer used an unaided system, alphabet board or VOCA. | <ol style="list-style-type: none"> A 9 year 1month old girl who is CP and uses AAC Adult female SLP | 249 Grade 4 pupils, aged 9.06 - 10.89 yrs., 124 male 125 female |
| Attitudes of Children toward a similar-aged child who uses augmentative communication. Beck & Dennis (1996). | <ol style="list-style-type: none"> To determine if peer attitudes to a disabled AAC user differ depending on whether the school attended integrates disabled pupils To determine whether peer attitudes differ depending on whether a alphabet board or VOCA are used by the AAC user. To assess whether attitudes differ as a function of the gender of the peers | <ol style="list-style-type: none"> A 13 year old boy who is C.P. and an AAC user An adult female SLP | 186 Fifth Grade pupils, 106 boys 80 girls |

Table 2.2 Comparison of Attitude Scales, Research Findings and Recommendations of Attitudinal Studies to AAC users.

| STUDIES | MEASURING INSTRUMENTS | RESEARCH FINDINGS AND RECOMMENDATIONS |
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| The effects of Information and AAC technique on attitudes toward Non-speaking Individuals. Gorenflo & Gorenflo (1991). | ATNP- Attitude Toward Non-speaking Persons Scale. 29 items 5 point Likert-type scale | <ol style="list-style-type: none"> 1. Attitudes are significantly more positive towards a disabled person using a VOCA. 2. Additional information on the AAC user effected more favourable attitudes. 3. Information & technique both affected general evaluative attitudes but technique alone positively affected attitudes toward interaction with the user. 4. Future research to determine which AAC device variables affect attitudes. |
| Variables Influencing Perceptions of communicative competence of an adult AAC user. Bedrosian et al. (1992). | Devised own questionnaire 30 items 5 point Likert-type scale | <ol style="list-style-type: none"> 1. The use of phrases (as opposed to words) had a positive effect on the ratings of the SLPs but not the naïve viewers. 2. The partner conversational variable of re-auditorization failed to influence perceptions of communicative competence. 3. Naïve adults rated the AAC users as being more competent than did the SLPs who used more stringent criteria due to their experience with AAC. |
| Effects of Speech Output Type, Message Length and Reauditorization on Perceptions of the Communicative Competence of an Adult AAC user. Hoag & Bedrosian (1992). | Questionnaire as for above study. 30 items 5 point Likert-type scale | <ol style="list-style-type: none"> 1. Regardless of speech output type (digitised/synthetic) or re-auditorization naïve observers rated the AAC user more competent when he used phrases as opposed to words. 2. Aided message length thus resulted in a simple main effect of a more favourable rating of communicative competence by naïve viewers. 3. Utterance intelligibility contributes positively to an assessment of communicative competence, but is not equivalent to it, or assessed in the same way. |
| Variables affecting perceptions of Social aspects of the communicative competence of an adult AAC user. Hoag et al. (1994). | 13 selected items from the questionnaire of the Bedrosian et al. study 1992 5 point Likert-type scale | <ol style="list-style-type: none"> 1. Longer message length by the AAC user resulted in a more favourable rating of social competence by the naïve viewers 2. Reauditoization failed to have an impact on subjects ratings 3. The SLPs rated the user lower on certain aspects such as attention management, conversational breakdown and his level of participation. 4. The interpretation of 3rd party evaluations on AAC interactions must be viewed with caution. Attitudes obtained in this way may indicate an appreciation of the AAC user's abilities without the willingness to engage an AAC user in conversational interaction. |
| Children's attitudes toward a nonspeaking child using various AAC techniques. Blockberger et al. (1993). | Chedoke-McMaster Attitudes toward Children with Handicaps Scale (CATCH) 36 items 5 point Likert-type scale | <ol style="list-style-type: none"> 1. The AAC technique had no discernible immediate impact on attitudes. 2. The researchers suggested the cause for the above finding was that children's reactions to disabilities are less differentiated than those of adults. 3. Girls had more positive attitudes to the AAC user than boys. 4. Subjects who reported that they interact with disabled peers had more favourable attitudes to the disabled AAC user. 5. Subjects with higher reading comprehension ability also had more positive attitudes to the AAC user. |
| Attitudes of Children toward a similar-aged child who uses augmentative communication. Beck and Dennis (1996). | CATCH scale. | <ol style="list-style-type: none"> 1. The type of AAC aid showed no effect on attitude scores. 2. Girls had more favourable attitudes to the AAC user than boys. 3. Children attending schools where disabled were integrated had more positive attitudes. 4. Researchers suggest the CATCH may not be sensitive to differences in children's responses to the type of aid used. 5. Researchers recommend the development of an attitude scale designed to detect differences in peer attitudes to AAC users. 6. Design and evaluation of programmes to facilitate peer/AAC user interaction. |

2.12 SUMMARY

The anecdotal evidence of users, experience of clinicians and the research of Gorenflo & Gorenflo (1991) as well as Schepisis & Reid (1995) support the hypothesis that voice output will have a positive effect on the attitudes of peers to a disabled child who uses an AAC device.

Conversely, the research of Blockberger *et al.* (1993) and Beck & Dennis (1996) suggests the output mode of the AAC device used by a disabled child with LNFS was not associated with a difference in peer attitudes. Further research is thus required to determine the impact of voice output, as a characteristic of a child's AAC system, on the attitudes of unfamiliar peers.

The questionnaires used to determine adults' attitudes to AAC users (ATNP, the ATDP and the communication competence questionnaire of Bedrosian *et al.* 1992) were not considered to be totally suitable for use by children. Likewise, the sensitivity of the CATCH, which was developed for a more general purpose, was queried in terms of its suitability for differentiating attitudes towards various AAC techniques used by children. Thus, there is a need to develop a suitable tool to measure the attitudes of peers to a child with disabilities including LNFS, including measuring the peers' evaluation of the AAC user's communicative competence.

This investigation, therefore, also included an attempt to design an attitude scale to measure adequately any difference in attitudes toward children who are AAC users, dependent on the output mode of the devices used.