

Perspectives on AAC systems by the users and by their communication partners

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ABSTRACT

The study examined the perspectives of augmentative and alternative communication (AAC) users and their 'formal' and 'informal' communication partners in relation to two areas of relevance to AAC: firstly, communication strategies, and secondly, advantages and disadvantages of AAC systems. With respect to communication strategies, it was found that formal communication partners thought that more vocabulary for communicating social purposes was actually available to AAC users and they were less aware of daily routines within day and residential environments. With respect to advantages and disadvantages, three main areas of concern emerged: the effect of the AAC system on the users' communication; features of AAC systems; and the effect of AAC on the users' quality of life. Both high- and low-technology AAC systems were seen as having advantages and disadvantages. This study demonstrates the important contribution to be made by AAC users in the provision of a new set of priorities based on their user experiences.

Key words: augmentative and alternative communication (AAC), cerebral palsy, communication partners, perspectives.

INTRODUCTION

In the last three decades technological advances have broadened the range and improved the quality of alternative and augmentative communication (AAC) systems (Zangari, Lloyd & Vicker, 1994). Numerous studies have drawn attention to the benefits generated by the introduction of AAC for people with little useful speech of their own (for example, Beukelman, 1991; Van Tatenhove, 1991). Given the present emphasis on outcome measurement and consumer satisfaction (Blackstone, 1995), it is somewhat surprising that there is little systematic evidence of the impact of these advances on the quality of communication. Even less is known about the perceptions of AAC system users on these technological advances. Some studies have incorporated measures of user preference. For example, Soto, Belfiore, Schlosser and Haynes (1993) designed a study which revealed that their subject (an adult AAC user) had a strong preference for an electronic AAC system with voice output over a communication board with an identical overlay. The procedure involved only the *physical* selection of one of the available AAC systems by the subject over several conditions, and thus there was no information about the reason(s) why one system was selected over

another. Most studies, however, have investigated the quality of AAC systems by comparison of several systems. Szeto, Allen and Littrell (1993), for example, recognised a need for comparisons of various electronic communication devices, but encountered a number of methodological difficulties. Firstly, Szeto and colleagues (1993) had difficulty in choosing a sample of communication systems which could be regarded as representative of the ever-growing number of electronic AAC systems. Secondly, the researchers had difficulty in recruiting a sufficient number of subjects with a comparable degree of disability and a similar amount of experience of the communication system(s) being used in the study. In order to avoid cognitive and physical differences across subjects and, in order to have a sufficient number of subjects, Szeto, Allen and Littrell (1993) recruited as subjects 16 able-bodied college students with no experience of AAC systems. As Szeto and colleagues (1993) acknowledge, the deployment of able-bodied subjects limits the universal applicability of their findings; whilst the data reveal large variations in terms of speed and accuracy across the systems, the results may not be generalisable to other subject groups. Without the views of the AAC users themselves, one can only speculate about the impact of communication systems.

Other studies have produced detailed case studies of individual users. Todis and Walker (1993) studied the impact of assistive technology (AT), i.e. mechanical, electrical or computerised tools used to enhance the day-to-day functioning of people with physical disabilities in the educational setting. Their 1993 study produced a wealth of information, and stressed the benefits of a 'team approach' in optimising the impact of AT. These authors assert that in order to optimise the impact of AT for students with disabilities, professionals must access and understand the perspectives of all those involved: the parents, specialists, teachers, classmates and the AT users themselves. Todis and Walker (1993) conducted participant observation sessions and interviews in order to collect data which they claim are representative of the perspectives of all those involved. However, whilst some participants (parents, teachers and other staff members) were interviewed about various issues, the AT users were only observed in the participant observation sessions. At no time were the AT users given a forum to offer their own perspectives and thus it cannot be assumed that the perspectives expressed by members of other groups are representative of those of the AT users.

Patston (1993) notes that the field of AAC remains dominated by professionals, and that AAC users are rarely given the chance to express their own views on the matter. This is despite the demonstration by some studies that AAC users (and potential AAC users — see Koenigsfeld, Beukelman & Stoefen-Fisher, 1993) have developed informed opinions about communication systems.

In their study of Dawn, an individual with cerebral palsy who uses AAC, Smith-Lewis and Ford (1987) were struck by her 'keen insights and her ability to articulate major deficiencies in the approaches used when designing augmentative systems' (p. 17).

In the realm of artificial intelligence, time and money are wasted when the design of a system, based on the engineer's perspective, is not compatible with the needs, capabilities and desires of the system users (Zaff, McNeese & Snyder, 1993). In the experience of Patston (1993), the views of AAC users and those of the professionals working with them are frequently incongruous, and he calls for increased attention to be paid to the perspective of the users. Huer and Lloyd (1990) produced a summary of 165 AAC users' perspectives gleaned from articles

published between 1982–1987. The issues raised by the AAC users had several common themes: frustration; attitudes towards professionals; communication partners; aided techniques; and communication and speech. These themes engendered some possible implications for the future practice of service providers. Although Huer and Lloyd (1990) have shown the potential importance of AAC users' perspectives, their results, as they note, are 'secondhand accounts' (p. 248).

The present study was designed to elicit and explore the perspectives on AAC systems* of three groups of people: AAC users themselves and two kinds of communication partner who work on a regular basis with AAC users on their AAC systems. The study focused on two areas of investigation which were selected by the researchers to examine consumer satisfaction in terms of perspectives on the quality of communication using alternative and/or augmentative means, and also on the quality of AAC systems. The first of these areas explored perspectives on strategies of communicating using as a basis Light's (1988) characteristics of the social purposes of communicative interactions. Light (1988) proposes four such characteristics: expression of needs and wants; information transfer; social closeness; and social etiquette. The present study selected an example situation for each of these characteristics and, through a series of questions, studied the participants' perspectives on communicative strategies. The second area of investigation explored the participants' perspectives on the advantages and disadvantages of AAC systems.

METHOD

Participants

Participants consisted of AAC users and their (speaking) communication partners. A previous study (Murphy et al., 1995) had identified 93 adolescent and adult AAC users who had cerebral palsy and who were resident in Central Scotland. The age range was 13–70 years. Eighty-nine subjects participated in the present study.** Of the 89 AAC users, 41 used some form of low-technology system (i.e. non-electronic), 27 used some form of high-technology system (i.e. electronic, many of which had voice-output) and 21 used both low- and high-technology AAC systems. Of the 41 low-technology AAC users, 36 used direct selection methods*** of accessing and the remaining five required their communication partners to scan their systems in order to select appropriate messages. Of the 27 high-technology AAC users, 17 used direct selection methods of accessing, and 10 used scanning selection.† Of the 21 AAC users

*For the present purposes, 'AAC system' is defined as any aided system which has the capacity to replace, although often assists, natural speech. Signing and equipment such as amplifiers and hearing aids are not included. The terms 'AAC system' and 'communication system' are sometimes used to refer to the complete multi-mode combination of techniques and strategies from which an AAC user may draw. However, in this paper 'system' is used synonymously with 'device' or 'aid'.

**The data sets for the remaining four subjects were incomplete.

***Direct selection methods involve AAC users pointing with some part of their body, sometimes with appropriate electronic or mechanical assistance, directly to symbols on an AAC system (Murphy et al., 1995). This includes eye pointing and the use of an optical pointer.

†Scanning selection with high-technology AAC systems involves a motor act on the part of the AAC user which controls the movement of a cursor or lights on the display of the device in order to select an item from an array of symbols (Murphy et al., 1995).

who had available both high- and low-technology systems, 17 used direct selection methods of accessing for both types of system, three used scanning selection for both types of system and one individual used scanning selection for his high-technology system and direct selection for his low-technology system.

There were two kinds of communication partner. Firstly, 89 'formal' communication partners were selected *by the researchers*. These were those professionals who were mainly responsible for training the user in AAC and were mostly speech and language therapists but they also included teachers and speech and language therapy assistants. Secondly, 89 'informal' communication partners were selected *by the AAC users* as the people with whom they felt comfortable and whom they saw on an 'everyday' basis. This second subgroup included key workers, friends, nurses and classroom assistants.

Procedure

All the relevant agencies (health boards, voluntary agencies, social work departments and education departments) were contacted, the project was explained to them and permission to carry out the research was requested. *All* adult and adolescent users of AAC systems with cerebral palsy from Central, Tayside, Lothian and Strathclyde regions in Scotland were asked to participate in the study and assurance was given about confidentiality of the data. All identified AAC users and their formal and informal partners agreed to take part in the study, and visits to the establishments where the AAC users spent their time during the day were arranged.

All three subgroups of participants were interviewed. The interview was developed by two of the present researchers on the basis of a pilot study funded by the Scottish Council for Spastics.* This paper will report two sections of the interview which correspond to the two areas of investigation outlined in the Introduction. The first section aimed to study the participants' perspectives of the communicative strategies used to communicate four functions. The functions, listed below, are based on Light (1988):

- Asking for a drink (expressing needs and wants).
- Describing a holiday (transmitting information).
- Opening a conversation.
- Closing a conversation (social closeness/social etiquette).

This section of the interview was structured: the participants were asked five pre-set closed questions (i.e. questions which require confirmation or denial) for each communicative function in order to identify five aspects of the AAC users' communication. If a participant did not understand a question, it was repeated and an example was provided. The questions, as applied to the first function, were as follows:

1. Does *the AAC user* have the vocabulary available to *ask for a drink*?
2. If available, does *the AAC user* use this vocabulary to *ask for a drink*?
3. Does *the AAC user* employ a single mode or a combination of modes to *ask for a drink*?

*The Scottish Council for Spastics is now known as Capability Scotland.

4. If *the AAC user* employs a single mode of communication to *ask for a drink* is it an AAC system or another mode?
5. Does *the AAC user* experience problems when *asking for a drink*?

The second section of the interview aimed to identify the perspectives of the three subgroups of participants on the advantages and disadvantages of the particular AAC system(s) with which they were involved. In a semi-structured interview, participants were asked to list their comments and to elaborate on them as much as they wished. There was no time limit. Participants stated perceived advantages and disadvantages separately. These statements included one or more comments. A comment was defined as a single characteristic of an AAC system, for example '*it's too big*', '*she can ask for things*'. The interviewers refrained from prompting the participants, and the comments were recorded verbatim, in order to control for interviewer bias. As a result, the researchers had a record of every comment concerning the advantage and the disadvantage uttered, by whom the comment was made and at which AAC system (in terms of high- and low-technology) the comment was directed.

RESULTS

The results for Section 1 of the study involve data in the form of frequencies. Chi-square provides a test of the significance of the difference in proportions (Robson, 1983).

The first two questions were concerned with the participants' perspectives of the availability and use of vocabulary for specific functions. The responses to both questions are presented in Table 1.

Table 1: Availability and use of vocabulary

Communication situation	Participant group	Vocabulary available: frequency of 'Yes' response (%)	χ^2	Vocabulary used: frequency of 'Yes' response (%)	χ^2
Asking for a drink	Formal partner	77 (86.5)	NS	63 (81.8)	$\chi^2 10.8$, d.f. 2; $p < 0.01$
	Informal partner	66 (74.1)		44 (66.6)	
	AAC user	66 (74.1)		59 (89.3)	
Describing a holiday	Formal partner	57 (64.0)	NS	48 (84.2)	NS
	Informal partner	44 (49.4)		35 (79.5)	
	AAC user	43 (48.3)		39 (90.6)	
Opening a conversation	Formal partner	53 (59.5)	$\chi^2 6.83$, d.f. 2; $p < 0.05$	33 (62.3)	NS
	Informal partner	37 (41.5)		24 (64.8)	
	AAC user	39 (43.8)		30 (76.9)	
Closing a conversation	Formal partner	43 (48.3)	$\chi^2 8.37$, d.f. 2; $p < 0.05$	18 (41.8)	$\chi^2 9.3$, d.f. 2; $p < 0.01$
	Informal partner	26 (29.2)		14 (53.8)	
	AAC user	28 (31.5)		22 (78.5)	

The responses concerning the availability of vocabulary for the four examined functions revealed differences in the perspectives of the three subgroups of participants. For the four functions, more formal partners thought that specific vocabulary was available than did either informal partners or AAC users (see Table 1 above).

In contrast, the responses to the second question showed that across all four functions AAC users claimed more often than their partners that they used the available vocabulary. Significant differences in their perspectives were found for two of the four functions: 'Asking for a drink', in which AAC users and formal partners claimed greater use of the available vocabulary than did informal partners; and 'Closing a conversation', in which AAC users and informal partners claimed greater use of the available vocabulary than did formal partners (see Table 1 above).

The third question asked the participants whether the AAC users employed a single mode or a combination of modes to communicate the functions under focus. Their responses are presented in Table 2.

Table 2: *Employment of a single mode of communication versus a combination of modes*

Communication situation	Participant group	Frequency of single mode use (%)	Frequency of combined mode use	χ^2
Asking for a drink	Formal partner	61 (70.9)	25 (29.0)	NS
	Informal partner	59 (67.8)	28 (32.1)	
	AAC user	62 (75.6)	20 (24.4)	
Describing a holiday	Formal partner	53 (60.9)	34 (39.1)	χ^2 10.27, d.f. 2; $p < 0.01$
	Informal partner	49 (56.3)	38 (43.7)	
	AAC user	62 (79.4)	16 (20.5)	
Opening a conversation	Formal partner	44 (53.0)	39 (22.9)	χ^2 11.32, d.f. 2; $p < 0.01$
	Informal partner	46 (55.4)	37 (46.9)	
	AAC user	57 (77.0)	17 (22.9)	
Closing a conversation	Formal partner	41 (65.0)	22 (34.9)	χ^2 7.45, d.f. 2; $p < 0.05$
	Informal partner	43 (78.1)	12 (21.8)	
	AAC user	41 (86.6)	6 (13.3)	

Table 2 above shows that significant differences in the perspectives of the participants were found for three of the four functions. For 'Describing a holiday' and for 'Opening a conversation' more AAC users than communication partners claimed that they used a single mode of communication. For 'Closing a conversation', more AAC users than formal partners claimed the use of a single mode, although no significant differences were found either between AAC users and informal partners or between the two subgroups of partners. One can see from Table 2, however, that several participants did not respond to this

question. This might suggest that all three subgroups were uncertain about the AAC users' mode of communication. Moreover, in all four functions, fewer AAC users than their communication partners claimed that they used combined modes. This suggests that communication partners may treat AAC users' non-verbal behaviours as communicative even if AAC users themselves do not.

The fourth question was directed at those who, in their responses to the previous question, had indicated that the AAC users employed a single mode of communication. They were asked whether this single mode was AAC or another mode of communication. Data are presented in Table 3.

Table 3: Employment of AAC system in single mode use

Communication situation	Participant group	Frequency of use of AAC system	Frequency of use of other mode	χ^2
Asking for a drink	Formal partner	20 (32.7)	41 (67.2)	$\chi^2 7.44$, d.f. 2; $p < 0.05$
	Informal partner	16 (27.1)	43 (72.8)	
	AAC user	31 (50.0)	31 (50.0)	
Describing a holiday	Formal partner	29 (54.7)	24 (45.2)	$\chi^2 6.94$, d.f. 2; $p < 0.05$
	Informal partner	21 (42.8)	28 (57.1)	
	AAC user	42 (67.7)	20 (32.2)	
Opening a conversation	Formal partner	28 (63.6)	16 (36.3)	$\chi^2 21.75$, d.f. 2; $p < 0.01$
	Informal partner	8 (17.3)	38 (82.6)	
	AAC user	18 (31.5)	39 (68.4)	
Closing a conversation	Formal partner	3 (7.3)	38 (92.6)	$\chi^2 11.26$, d.f. 2; $p < 0.01$
	Informal partner	4 (9.3)	39 (90.6)	
	AAC user	13 (46.4)	28 (68.2)	

More AAC users indicated the exclusive use of AAC than either of the subgroups of partners for each function except for 'Opening a conversation', for which more formal partners perceived greater AAC use than the other two subgroups of participants (see Table 3 above). It is possible that formal partners, as the people mainly responsible for training the AAC users in the use of their systems, would encourage the exclusive use of AAC at the beginnings of conversations, as practising to communicate with the device may be the main reason behind their interaction.

The final question elicited the perspectives of the participants on the extent to which the AAC users experience problems when communicating these functions. It was revealed that more AAC users considered there to be problems than did communication partners for all functions except for 'Describing holidays' (see Table 4).

Table 4: *Extent of the problems experienced by the user when communicating*

Communication situation	Participant group	Problems: frequency of 'Yes' response (%)	Problems: frequency of 'No' response	χ^2
Asking for a drink	Formal partner	15 (17.2)	72 (82.7)	χ^2 6.76, d.f. 2; $p < 0.05$
	Informal partner	14 (16.8)	69 (83.1)	
	AAC user	25 (31.6)	54 (68.3)	
Describing a holiday	Formal partner	51 (58.6)	36 (41.3)	NS
	Informal partner	53 (60.9)	34 (39.1)	
	AAC user	42 (54.5)	35 (45.4)	
Opening a conversation	Formal partner	11 (13.0)	73 (86.9)	χ^2 28.0, d.f. 2; $p < 0.01$
	Informal partner	11 (13.2)	72 (86.7)	
	AAC user	33 (44.0)	42 (56.0)	
Closing a conversation	Formal partner	20 (28.9)	49 (71.0)	χ^2 6.47, d.f. 2; $p < 0.05$
	Informal partner	26 (39.3)	40 (60.6)	
	AAC user	31 (50.8)	30 (49.2)	

It appears that, in general, the differences in the participants' perspectives reflect the roles that formal and informal partners have with respect to AAC users. Formal partners, most of them speech and language therapists, are generally in contact with AAC users during set training/therapy periods while informal partners are generally in contact with AAC users on a day-to-day basis (i.e. during leisure, meal times and so on). For example, the data show that more formal than informal partners thought that AAC users ask for a drink using the available vocabulary. However, the present researchers observed, and were informed of such by the informal partners, that drinks in day/residential centres are generally made available at set times. There is therefore little need for vocabulary for requesting drinks. Formal partners, however, may be less aware of set daily routines in institutional centres and therefore, take it for granted that such a basic vocabulary is not only available but is also used. The *Position Paper* of the College of Speech Therapists (College of Speech Therapists, 1989) advocates that the role of the speech and language therapist includes the development of an integrated system of communication, i.e. selecting the vocabulary and putting it into AAC systems. It may then be that the person who knows *least* about what is going on in everyday settings is having to take the responsibility for the selection of a complete repertoire of vocabulary for an individual AAC user.

Beukelman and Mirenda (1992) note that one individual rarely has the knowledge or experience required to select a complete repertoire of vocabulary for an AAC user. Morrow (cited in Blackstone, 1988) notes the impor-

tance of the involvement of significant others in vocabulary selection. Morrow compared vocabulary lists selected by three groups of participants: speech and language therapists; teachers; and parents for the same group of physically disabled children. The results revealed that whilst speech and language therapists generated the most words, the parents and teachers contributed many important 'fringe words' (p. 5). In order for the development of communication systems to be fully effective, the present data suggest that the selection of vocabulary should involve a three-way stream of information and advice between speech and language therapists, AAC users and other communication partners. Murphy, Marková, Collins and Moodie (1996) stress the importance of vocabulary selection, stating that the inclusion of irrelevant vocabulary is a major disincentive to the use of an AAC system. They conclude that vocabulary should be 'unique to the individual [AAC user], depending on his or her age, gender, interests, culture and previous experience' (p. 43).

Finally in relation to the first section of the interview, AAC users reported experiencing more communication problems than were anticipated by their communication partners for most of the communicative functions. One plausible explanation for the general disparity in perspectives is that the communication partner is not understanding as much as the AAC user is trying to communicate.* This suggests that communication partners should be more aware of the potential for misunderstanding in communication with AAC users. The potential for misunderstanding could occur for seemingly contradictory reasons — the communication partner may process and interpret too little (as in this example) or too much (as discussed earlier) of the AAC user's behaviour. In the present example, the communicative function which the two subgroups of partners viewed as problematic, that of 'Describing a holiday', may reflect the fact that the AAC user's message would be harder to predict for this function.

In the second section of the interview, 89 formal and 89 informal communication partners responded, but only 35 AAC users did so. Although the remaining AAC users may have had opinions about advantages and disadvantages of their AAC systems, they were unable to express them to the researchers. A total of 1170 comments concerning advantages and disadvantages of the various systems were recorded. Table 5 shows the breakdown of perceived advantages and disadvantages in relation to high- and low-technology AAC systems across the three subgroups of participants.

*This is supported by videos of conversations between AAC users and their communication partners collected as part of the same project and discussed elsewhere (for example, *Communication Matters Special Research Issue* Stirling University (1994) 8: 3.)

Table 5: Numbers of perceived advantages and disadvantages of AAC systems

Comment type	Formal partner	Informal partner	AAC user	Total
High-technology advantage				
Frequency	188	132	50	370
Row (%)	(50.8)	(35.7)	(13.5)	(100)
Column (%)	(28.8)	(31.5)	(50.5)	
High-technology disadvantage				
Frequency	148	115	31	294
Row (%)	(50.3)	(39.1)	(10.6)	(100)
Column (%)	(22.7)	(27.4)	(31.3)	
Low-technology advantage				
Frequency	152	80	9	241
Row (%)	(63.1)	(33.2)	(3.7)	(100)
Column (%)	(23.3)	(19.1)	(9.1)	
Low-technology disadvantage				
Frequency	164	92	9	265
Row (%)	(61.9)	(34.7)	(3.4)	(100)
Column (%)	(25.2)	(22.0)	9.1	
Total (%)	652 (100)	419 (100)	99 (100)	1170

The comments ranged from general points which were relevant for all AAC systems to very specific and idiosyncratic ones which were relevant to a particular AAC system. In order to avoid imposing any theoretical and conceptual biases, the data were coded by use of the Constant Comparative Method, developed by Glaser and Strauss (1967). This method is highly inductive, allowing the addition of new categories whenever a unit of data (i.e. a comment in this instance) does not fit with the categories already established in this way. Thus the comments were constantly compared against each other and categories *emerged* from the data as necessary. Inspection of the categories has shown that there were three main concerns expressed in their comments. These concerns encompassed all 1170 comments — both advantages and disadvantages. The first concern related to the AAC users' communication. The participants expressed comments which described changes in the communication of AAC users as a direct result of the AAC system. The second concern was with the features of AAC systems, both technological characteristics and maintenance requirements. The final concern related to the effect of AAC on the users' quality of life. Table 6 shows the proportion of comments within each of the three main concerns.

Table 6: Proportion of comments about the main concerns about AAC systems

Categories	Formal partner (%)	Informal partner (%)	AAC user (%)
AAC users' communication	22.4	24.1	16.2
Features of AAC systems	60.7	61.6	64.6
AAC users' quality of life	16.9	14.3	19.2
Total	100	100	100

Summaries of the participants' comments are presented below within the three main concerns and under their category headings. The figures after each category heading denote the frequency of advantages and disadvantages from each participant group.

AAC Users' Communication

Universal communication

- Formal partner (FP): 25 advantages, 17 disadvantages.
- Informal partner (IP): 24 advantages, 1 disadvantage.
- AAC user (U): 5 advantages, 1 disadvantage.

These comments reflected the extent to which AAC users are able to communicate *anything* and with *anybody* as a result of their AAC systems. All three subgroups of participants cited more advantages of high-technology systems than of low-technology systems in this regard. Furthermore, all of the disadvantages pertained to low-technology AAC systems. The informal partner and AAC user both expressed the same disadvantage — that the user '*Can't communicate with strangers*', i.e. with someone unfamiliar with the system. The comments of the formal partners detailed further examples of people with whom the AAC user cannot communicate: illiterate people, partially sighted people, other residents and people '*At the other side of the room*'.

Both subgroups of partners (but no AAC users) cited some advantages for low-technology systems. Some of these advantages offset the disadvantages mentioned above — for example, '*Can communicate with strangers*'; '[the AAC user] *can talk with a wide range of people*'; communication is possible with '*People who aren't familiar with the user's personal modes*'.

AAC affects use of other modes

- FP: 9 advs, 5 disadv.
- IP: 4 advs, 5 disadv.
- U: 0 advs, 1 disadv.

These comments concerned the effect which an AAC system can have on the other modes of communication available to the AAC user. All three subgroups of participants felt that a disadvantage of AAC systems was that they discourage, or make less obvious, other modes of communication. Both subgroups of partners commented on the occlusion of verbal and non-verbal modes (for example, '*People now ignore non-verbal ways of communicating*') and of other modes of AAC (for example, '*Her TouchTalker occludes her chart*'). Several advantages were also expressed by the partners, and these differed in substance: the formal partners stressed the role of the AAC system as augmenting other modes, for example, '*Helps clarify [AAC user's] vocalisations*'; whereas the informal partners focused on the flexibility of the system, for example, '*Can be combined with other systems*'.

Effective communication

- FP: 31 advs, 0 disadvs.
- IP: 26 advs, 2 disadvs.
- U: 1 adv, 0 disadvs.

The effective transmission of a specific message may be affected by the capacities of the various AAC systems. Across all three subgroups of participants, perceived advantages outweighed perceived disadvantages. Indeed, there were only two disadvantages expressed, and these were by informal partners and pertained to the tendency of high-technology systems to '*Generalise rather than specify*'. This is contrary to current received wisdom in AAC of incorporating vocabulary which is applicable across a range of contexts. Interestingly, generalisable vocabulary was frequently cited as an advantage by formal partners.

The advantages expressed by informal partners and the single AAC user were global comments which pertained to the whole process of communication, for example, '*He can now communicate more effectively*', '[the AAC user] *can say things which he couldn't before*', '*it depends on what I am saying, sometimes it helps me*', whilst the formal partners stressed the advantageous effect of the vocabulary contained within the AAC system — for example, that the AAC user can deal with choices, abstract issues, specificity and messages which cannot be easily transmitted through gesture.

Expression of opinions

- FP: 7 advs, 1 disadv.
- IP: 6 advs, 0 disadvs.
- U: 5 advs, 0 disadvs.

These comments included a large number of advantages from AAC users. Comments mainly related to their ability, facilitated particularly by high-technology systems, to express their own views and feelings. One AAC user commented that she enjoys a new-found capability: '*I can give cheek back!*'

The comments of communication partners also focused on the AAC users' ability, and more seldomly inability, to express (aspects of) their personalities, including feelings, emotions and opinions.

Availability of AAC systems

- FP: 11 advs, 11 disadvs.
- IP: 1 adv, 4 disadvs.
- U: 0 advs, 0 disadvs.

There were differences in the perspectives of the three subgroups of participants as to whether AAC systems were *immediately* available to their users. Firstly, while the AAC users made no comments, both subgroups of partners made several. Secondly, the distribution of the partners' comments was different, with the informal partners stressing the unavailability of AAC systems. The perspectives of the formal partners were split, some commenting on *availability* and others on *unavailability* of AAC systems. Specific reasons for the perceived availability/unavailability of the systems were not provided.

Use of AAC systems

- FP: 7 advs, 13 disadvs.
- IP: 3 advs, 14 disadvs.
- U: 0 advs, 0 disadvs.

These comments concerned the extent to which AAC users could use their systems. There are a multitude of factors which govern whether an AAC system is used. These issues are discussed in detail by Murphy, Marková, Collins and Moodie (1996) and they include: amount and type of training for both AAC users and communication partners, types of vocabulary in the AAC system and other modes of communication available to the AAC user.

Although the AAC users made no comments on this issue, the comments of both subgroups of partners covered similar points, i.e. describing the extent of use (for example, the AAC user *'Actually uses it!' or 'Doesn't like using it'*); and noting the relevance of its use/non-use in the home environment (for example, *'Her parents take it away and do everything for her'*; *'If he would use it in the flat where he's living, he could make more conversation at night'*). One formal partner noted that *'Others don't encourage its use'*, and another that *'He has wee speech cards in his bag which he only uses with his speech therapist — no one else'*.

AAC as a back-up

- FP: 9 advs, 0 disadvs.
- IP: 11 advs, 0 disadvs.
- U: 3 advs, 0 disadvs.

Most of the comments across all three subgroups of participants referred to the advantage of use of a low-technology system as a back-up for a high-technology one, for example, *'She will use it [Bliss board] if her TouchTalker isn't there'*. The few comments regarding high-technology systems referred to its use as a back-up to verbal or non-verbal modes.

Features of AAC Systems**Characteristics of AAC systems**

- FP: 71 advs, 99 disadvs.
- IP: 41 advs, 72 disadvs.
- U: 22 advs, 16 disadvs.

The advantages perceived by the AAC users focused on technical aspects, regardless of whether the system in reference was one with high-technology. For example, many AAC users cited the voice as an advantage of high-technology systems with voice output. This advantage is reinforced by the perception of many of the AAC users of the lack of voice as a disadvantage of low-technology systems. Similarly, a commonly cited disadvantage of high-technology systems was their tendency to break down, whereas the converse — i.e. the indestructibility of some low-technology systems — was perceived as an advantage by AAC users.

The kinds of comments made by both subgroups of partners were very similar. In common with the AAC users, the communication partners stressed the

benefits of the inclusion of a voice on some systems and the tendency of high-technology systems to break down, but also commented on the advantages of the memory of some of the systems and of their capacity to produce text. Whilst the voice was perceived as an advantage, there were several comments which referred to the lack of voice-clarity and the often unintelligible pronunciation as disadvantages.

Both sets of partners referred to the easy replaceability and to the expandable nature of low-technology systems as advantages, whilst their 'unofficial' or 'babyish' look and their perceived limited range of vocabulary were considered to be disadvantages.

Effects of features of AAC systems

- FP: 28 advs, 58 disadvs.
- IP: 19 advs, 40 disadvs.
- U: 2 advs, 14 disadvs.

A large number of comments referred to the effect that the characteristics of an AAC system can have on an AAC user's communication process.

Although the AAC users made relatively few comments about this issue, they did stress the ability to use the telephone, due to the capacity of high-technology systems to store messages and to the voice output device. Several AAC users commented on the difficulties in using high-technology AAC due to the technology itself. For example, '*The coding is hard to remember*'; '*It's confusing*'; '*Menu is complicated*'. With regard to low-technology systems, the AAC users mentioned how difficult it was to gain the attention of others as a result of the system being without a voice.

The two subgroups of partners covered similar points. For instance, both stressed being able to attract attention as an advantage of high-technology AAC systems and, conversely, the difficulty of doing the same with low-technology AAC systems as a disadvantage. Nevertheless, a lack of privacy was reported for both high- and low-technology systems, with one formal partner claiming that they make it '*Very difficult to have a private conversation in a public place*'. Both subgroups of partners also noted the disadvantages of the maintenance of high-technology systems and the updating requirements of low-technology ones. The formal partners, but not the informal partners, noted that AAC systems — and low-technology in particular — can be mislaid and lost. The formal partners also commented on the frequent misunderstandings which result from the poor spelling of some users of spelling-based AAC systems. Some informal partners mentioned that a low-technology AAC system may contain a lot of information about the AAC user, and that this, in turn, helps the communication partner to think of topics of conversation.

Rate of communication

- FP: 3 advs, 15 disadvs.
- IP: 2 advs, 23 disadvs.
- U: 3 advs, 1 disadv.

There were few advantages expressed about this issue. Apart from the odd comment from communication partners, for example '[AAC user] *can tell you something a lot quicker than he used to*', advantages were mainly cited by the AAC users, for example '*I can talk with less presses*'. Several disadvantages were noted by both subgroups of partners regarding the slowness of the communication process with some AAC systems, for example, '*It's [communication] slow because of the switch grid*'. Although most comments did not stipulate for whom the slow rate of delivery was a disadvantage, an informal partner noted that the slowness can be '*Time consuming for the [communication] partner*'.

Portability

- FP: 17 advs, 9 disadvs.
- IP: 9 advs, 6 disadvs.
- U: 2 advs, 1 disadv.

All three subgroups of participants perceived both advantages and disadvantages related to this issue. The lightweight nature of many low-technology AAC systems, such as communication books and boards, enables them to be carried almost anywhere, for example, '*It's easier to carry from class to class*'. The mounting of many high-technology systems to the AAC users' chairs means that the system can go wherever the user goes, for example, '*It's with her all the time — fixed in front of her, on her chair*'. A related disadvantage, however, is that '*It makes the chair heavy to push*'.

Expense

- FP: 7 advs, 5 disadvs.
- IP: 0 advs, 5 disadvs.
- U: 0 advs, 0 disadvs.

The AAC users did not comment on the expense of the system. This may be due to the fact that once a user has an AAC system, the expense is no longer relevant to them. Both subgroups of communication partners commented on the costliness of high-technology AAC, and several formal partners commented on the inexpensive nature of low-technology systems.

Dependence of AAC systems on intervention by communication partners

- FP: 4 advs, 16 disadvs.
- IP: 2 advs, 5 disadvs.
- U: 0 advs, 0 disadvs.

These comments concerned the extent to which a communication partner must help an AAC user to transmit a message, for example, by interpreting or spelling out the message. The AAC users did not comment on this issue, but both subgroups of partners did. It appeared that both subgroups of partners viewed partner-dependence as a particular problem of low-technology systems (for example, '*Someone has to be with her, spelling it out all the time*').

Physical accessing

- FP: 17 advs, 17 disadvs.
- IP: 5 advs, 3 disadvs.
- U: 0 advs, 0 disadvs.

These comments reflected the ease with which AAC users can independently access their systems from the initial decision to communicate (when the AAC system may still be in a bag or a cupboard) and throughout the interaction. Formal partners tended to make comments on low-technology systems in reference to another AAC system, for example, '*Easier accessing*'. Such comments were made in comparison to both high- and low-technology systems, depending on individual circumstances. Other than this difference, the partners' comments tended to reflect similar perspectives, with both subgroups noting good and poor accessing for both high- and low-technology systems.

Familiarity of AAC users and/or communication partners with AAC systems

- FP: 13 advs, 10 disadvs.
- IP: 5 advs, 3 disadvs.
- U: 2 advs, 0 disadvs.

Comments which referred to the familiarity of AAC users were perceived advantages of mainly low-technology systems, for example, '*He's so used to it*'; '*He's used it most of his life*'. These comments were very similar across all three subgroups of participants.

Regarding the familiarity of communication partners with the system, several disadvantages of both high- and low-technology systems were perceived by both subgroups of partners, but the AAC users made no comments.

'Easiness' for communication partners

- FP: 3 advs, 4 disadvs.
- IP: 12 advs, 6 disadvs.
- U: 0 advs, 1 disadv.

These comments concerned the ease with which a communication partner can converse with an AAC user as a result of the AAC user's system. Comments were similar for both high- and low-technology AAC systems. The informal partners made several comments, for example, '*Helps staff to understand what he's saying*'; '*Easier to communicate with because [the AAC user] was difficult to make out*'; '*It's difficult for the partner to use — it would take a lot of practice to use it easily*'. The formal partners, however, made relatively few comments, and most of these were disadvantages associated with AAC systems, for example, '*It's [the system's] very difficult to understand*'; '*Staff have a fear of anything electronic*'.

AAC Users' Quality of Life**AAC users' feelings about their system**

- FP: 15 advs, 16 disadvs.
- IP: 7 advs, 8 disadvs.
- U: 9 advs, 2 disadvs.

The formal partners expressed advantageous feelings of the AAC users associated with high-technology systems, for example, '[the AAC user] *enjoys using it*'; '[the AAC user] *likes the structure of it*'. These advantages were offset, however, by disadvantages, for example, '[the AAC user] *doesn't like using it*'; '*expectations are too high*'. Regarding low-technology systems, the disadvantages appeared to outweigh the advantages. These disadvantages focused on the AAC users' frustration with low-technology and their general preference for high-technology where both systems were available.

The advantages expressed by informal partners had no particular focus, but included the AAC users' 'adult like' feelings, great sense of achievement in communicating, and keen interest in the planning of AAC systems. The disadvantages focused on the reluctance of some AAC users to use their systems due to the effort required. In common with the formal partners, the informal partners reported more negative feelings of low-technology systems than positive ones, and again these focused on the frustration of AAC users and their reluctance to use low-technology systems. One informal partner commented that an AAC user '*Doesn't want to be seen using it*'.

The AAC users themselves expressed only positive feelings for high-technology systems, and referred to a general preference for high- over low-technology AAC systems.

Others' perceptions of AAC users

- FP: 11 advs, 0 disadvs.
- IP: 7 advs, 0 disadvs.
- U: 2 advs, 0 disadvs.

All three subgroups of participants commented favourably on the capacity of high-technology systems in particular to alter the perceptions of others with regard to AAC users. Comments such as '*Others treat [the AAC user] as an individual*'; '*Others notice [the AAC user] more*'; '*Others can see the extent of [the AAC user's] intelligence*' were common examples. AAC users tended to refer to some aspect of normality: '*Strangers know I have normal intelligence*' and '*It is much quicker than a board and nearer normal*'.

AAC users' personal attributes

- FP: 29 advs, 0 disadvs.
- IP: 18 advs, 0 disadvs.
- U: 3 advs, 0 disadvs.

These comments were all perceived advantages and they revealed that high-technology AAC systems in particular have the capacity to positively affect AAC users' personal attributes. Both subgroups of partners commented on AAC users' increased self-esteem, self-confidence, independence, conversational control, sociability, and on a more obvious sense of humour, for example, '[the AAC user] *can joke*'; '*She can use it as a vehicle to convey humour, be outrageous — she does use it in a very personal way*'.

The AAC users' comments all centred on the possibility of independent living. One AAC user reflected on this very positively: '*I can talk; I can get this*'.

house; I can use the phone; I can make new friends; I can talk to taxi drivers; I can go to the pub; I can go anywhere'.

AAC users' motivation

- FP: 11 advs, 2 disadvs.
- IP: 1 adv, 5 disadvs.
- U: 0 advs, 0 disadvs.

The AAC users made no comments and the perspectives of the two subgroups of communication partners diverged with regard to this issue. Whilst the formal partners noted advantages for both high- and low-technology systems, for example, *'The system motivates him'*; *'She chose it so she's more motivated to use it'*, the informal partners concentrated on disadvantages associated with low-technology systems, for example, *'Don't think [the AAC user] wants to use it'*; *'They [Bliss symbols] are there if he wants to use them but he never does — lack of motivation'*.

AAC users' physical self

- FP: 1 adv, 1 disadv.
- IP: 1 adv, 0 disadvs.
- U: 0 advs, 3 disadvs.

The few comments concerning this issue were rather diverse. The formal partners noted the potential improvement in posture, and the informal partners noted the potential improvement in coordination. The AAC users did not perceive any advantages for their physical self, but two AAC users commented on their getting sore hands and one complained of sore eyes. A formal partner also noted a disadvantage, commenting that it is *'Physically tiring for [the AAC user]'*.

AAC users' intellectual self

- FP: 10 advs, 7 disadvs.
- IP: 7 advs, 0 disadvs.
- U: 0 advs, 0 disadvs.

The informal partner expressed only advantages regarding the AAC users' intellectual self. These included positive comments on AAC users' progress at college, a comment regarding the ever-extending vocabulary of an AAC user and a comment concerning the fact that an AAC user's intellectual ability had become more evident. The advantages expressed by the formal partner stressed language development, improvements in spelling and the capacity for one particular AAC user to have *'A place to explore his own thoughts'*. The formal partners also expressed disadvantages, concerning the limiting nature of low-technology systems which they felt did not allow some AAC users to fulfil their potential. The AAC users made no comments with regard to their intellectual self.

Others' attitudes about AAC

- FP: 1 adv, 6 disadvs.
- IP: 1 adv, 5 disadvs.
- U: 0 advs, 0 disadvs.

Many comments referred to the problem of the attitudes of others towards AAC as a whole, with both subgroups of partners producing similar comments. They noted that the focus of the communication partner was often on the AAC system, rather than on the individual AAC user, and that the partner may read the screen to save time, rather than await the voice. Also, for those less familiar with AAC, the partners commented that the systems may be viewed as strange or 'seen as a toy'. One formal partner commented on the capacity for high-technology systems in particular to '*Make other people like kids again*'. A formal and an informal partner noted that one advantage of high-technology systems was that they increase people's awareness of AAC as a viable form of communication.

DISCUSSION

The summaries of comments in this second section of the interview represent the researchers' views of the participants' perspectives, as they were presented to the researchers. The participants' views can be considered to be very informative in the following ways.

Firstly, in terms of sheer *number* of comments made by the participants, most of them are concerned with the characteristics of AAC systems. In terms of the type of comments, three main issues have been stressed:

- AAC users' communication.
- Features of AAC systems.
- AAC users' quality of life.

The present findings enable some parallels to be drawn with those AAC users' perspectives summarised by Huer and Lloyd (1990). In both studies there was emphasis on improved communication as a result of AAC systems. Specifically, in both data-sets there were comments about greater freedom of interaction and of increased opportunities for communication. Conversely, AAC users from both studies commented on the frustration often experienced in relation to the difficulty in making themselves understood. Also, AAC users from both studies commented on problems associated with physical accessing and their continued dependence on communication partners. Interestingly, Huer and Lloyd (1990) report that the AAC users in their study stressed the benefits of AAC systems rather than the limitations. In the present study, the AAC users reported as many perceived disadvantages of AAC systems as advantages. This may be due to changing times in that many features which used to be thought of as state of the art technology may these days be taken for granted. It is important to recognise that many of the advantages and disadvantages cited in this paper were expressed in relation to specific AAC systems and specific AAC users. The comments suggest that

the advantages and disadvantages of AAC systems *in the context of a specific potential user* should be an important consideration in the selection of an AAC system.

Secondly, from the comments they made, it can be seen that all three subgroups of participants covered common ground, but that the emphasis of each subgroup varied slightly. The AAC users each made several comments, but these were proportionally fewer than those made by the communication partners. The distribution of comments (see Table 6 above), reveals slight differences between the subgroups. The AAC users expressed proportionately more comments than did the communication partners about the effect that AAC systems had on their quality of life. Across all three subgroups of participants, most comments were made in relation to the features of AAC systems. In their comments, the AAC users demonstrated a clear preference for high- over low-technology AAC systems. During their time in the field, the researchers observed the presence of a 'pecking order' in which those people with high-technology AAC systems with voice output occupied a position of greater status and prestige, in comparison with those who used low-technology books or boards. Notably, the communication partners showed no overall preference for a particular type of AAC system. A significant difference between the communication partners is that the formal partners were more specific about the advantages and disadvantages of the various AAC systems than were the informal partners. This finding highlights a difference between formal and informal partners which could be nurtured to encourage their professional compatibility. Joint training for both formal and informal communication partners could promote better awareness and understanding of each other's perspectives and priorities.

Thirdly, it is important in the present study that both low- and high-technology AAC systems are perceived as having advantages and disadvantages. Both low- and high-technology systems appear to have their important functions in communication and therefore, any conclusion emphasising, for example, the importance of high-technology AAC systems and de-emphasising low-technology AAC systems would be erroneous.

IMPLICATIONS AND CONCLUSION

The aim of this study was to explore the perspectives of those people who were directly involved in the deployment of AAC. It was not the researchers' intention to evaluate whose perceptions were correct. Rather the interest in the participants' perspectives transpired because these may have an important effect on attitudes towards AAC systems, their use and availability and on the process of communication.

The interview has drawn attention to the type of comments made by the three subgroups of participants. Both high- and low-technology AAC systems are perceived as having advantages and disadvantages. When an AAC system is being selected for an individual AAC user, it appears that selection should not be based on the state of the art technical features of the system, but rather the emphasis should be on the suitability of the style of communication it offers to the potential user. Van Tatenhove (1991) presents her vision of the AAC systems of the future. However, Van Tatenhove (1991) qualifies the importance

she lays on features such as multilingual voice output and dynamic graphic displays, by asserting '[i]f these dream devices are to become a reality, the process of designing new technology needs to be consumer driven with a design team sensitive to the current and future needs of non-speakers' (p. 7).

As noted in the Introduction, the field of AAC has traditionally been dominated by the professionals involved. The present study has illustrated that whilst the perspectives of the participants sometimes converged, there were important instances in which their differing roles informed more varied perspectives on issues. This supports the findings of Noar's (1992) study which compared the perspectives of three groups of professionals (plastic surgeons, consultant orthodontists and speech and language therapists) involved in working with patients who have a cleft lip and/or cleft palate. On many issues, there was consensus among the perspectives of the three groups. But where there was any dissension, it tended to reflect the different experiences and expertise of the professionals involved (Noar, 1992). The present study has also demonstrated the important contribution to be made by users of AAC systems, in the provision of a new set of priorities based on their user-experiences. As noted by Williams (1995), the importance placed on outcome measurement lies not only in the phases of measurement and analysis but also in the utilisation of the findings in continuously improving both policy and practice. Williams (1995) presented a table of the forces which could influence AAC outcomes. Examples of these forces are users of AAC services or systems, manufacturers, funding bodies and researchers. Williams (1995) suggested that there is potential for some forces to pull from different directions and he posed the question of which force would have the greater say in the area of outcomes. The present study has demonstrated the validity of consolidating at least some of the forces outlined by Williams (1995). The insights offered by the perspectives of *all* those involved should inform the approach to AAC service provision.

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