

Contents

Augmentative Communication in Practice	2
<i>Allan Wilson</i>	
1. What is Augmentative and Alternative Communication? An Introduction	3
<i>Sally Millar and Janet Scott</i>	
2. Low Tech Methods of Augmentative Communication	13
<i>Janet Scott</i>	
3. Symbol Systems	19
<i>Alison MacDonald</i>	
4. Use of Symbol Software	27
<i>Pamela Cornwallis & Andrea Peacock</i>	
5. Matching Technology to Individual Needs	33
<i>Jane Donnelly & Annie Kirkaldy</i>	
6. High Technology Aids to Communication	36
<i>Deborah Jans and Sue Clark</i>	
7. Alternative Access to Communication Aids	46
<i>Deborah Jans & Sue Clark</i>	
8. Laying the Foundations of Communicative Competence for very Young Children	51
<i>Alison MacDonald and Caroline Rendle</i>	
9. The Child, Education and Augmentative and Alternative Communication	54
<i>Sally Millar</i>	
10. Augmentative Communication and Literacy – The SAIL Kit Approach	62
<i>Sally Millar and Jean Kerr</i>	
11. Strategies for Developing Pre-reading Skills for Nursery AAC Users	71
<i>Lynda Nichol and Caroline Rendle</i>	
12. Introducing a Reading Scheme to AAC Users	74
<i>Margaret Girdler and Julie Frame</i>	
13. Leaving School – Crisis or Opportunity. What is it for AAC Users?	77
<i>Janet Larcher</i>	
14. Adults with Acquired Communication Difficulties and AAC	82
<i>Lorna McAllister</i>	
15. Gerald's Story, So Far	87
<i>Gerald Masterson</i>	
16. Changing Attitudes	89
<i>Kate Ellis</i>	
17. AAC in the Community – A Personal Viewpoint	90
<i>Danny McFadden</i>	

Augmentative Communication in Practice

Allan Wilson

Augmentative Communication in Practice: Scotland is an open group composed of people who have an interest in augmentative communication – users of Augmentative and Alternative Communication, families, carers and professionals from a variety of disciplines. The main focus of the group's work is the annual Study Day held in Scotland every autumn since 1991. Over the years many hundreds of people have attended the Study Days to find out more about the use of low tech and high tech methods to help people with severe communication difficulties speak for themselves.

With the exception of 1991 and 1997 every Study Day has been accompanied by a book to bring together the various papers presented and provide a record of the research and developments in practice through the 1990s. The 1994 Study Day provided a general introduction to augmentative communication for people new to the field and the resulting book, *Augmentative Communication in Practice: An Introduction* has been used as an introductory text by many students and others wanting to find out more about the subject.

Augmentative communication is a field of rapid change so we thought that, four years on, the time had come for an update to the book. Rather than simply reprint the original book, with a few changes to reflect new developments, we have taken the opportunity to add updated papers from some of the other Study Days to provide an even broader introduction to augmentative communication, informed by clinical practice.

Sally Millar and Janet Scott set the scene in the opening chapter with a general introduction to augmentative communication emphasising many of the important issues such as funding, training and support that are vital to the successful implementation of augmentative communication. Janet Scott then takes a closer look at the wide range of 'low tech' communication methods that are employed as part of a communication strategy. The next two chapters concentrate on the use of symbols to enhance communication, with Alison MacDonald providing a stimulating overview of the rationale behind symbols and some of the systems in general use, leading into the use of computer software to provide practical examples of their use, as described by Pamela Cornwallis and Andrea Peacock.

The use of technology is examined in the next three chapters. Jane Donnelly and Annie Kirkaldy describe the principles that underlie the process of assessment to find the most appropriate communication system for an individual. Deborah Jans and Sue Clark then look at the wide range of high tech aids available and consider the very important access issues that arise.

Education is a vital subject for people with severe communication difficulties. Alison MacDonald and Caroline Rendle outline a framework for approaching augmentative and alternative communication work with very young children, while Sally Millar describes the major issues that impact on children using augmentative communication through their primary and secondary schooling. The quest for literacy is one of the most important topics in education, reflected by the three chapters devoted to the subject. Sally Millar and Jean Kerr outline the CALL Centre's approach to the subject, while Lynda Nichol and Caroline Rendle outline the methods used at Graysmill School in Edinburgh with nursery age children. Margaret Girdler and Julie Frame describe the same school's approach to the introduction of a new reading scheme.

Janet Larcher considers some of the difficulties faced by young people when they leave school through a series of case studies. Lorna McAllister, again, uses case studies to look at the very important subject of developing communication strategies for adults with acquired communication difficulties.

Contributions from the people who actually use augmentative communication systems have often provided the highlights of the annual Study Days. Gerald Masterson and Kate Ellis describe their experiences of using augmentative communication. Both regularly give presentations at international conferences, providing an example of where the use of augmentative communication can lead. Danny McFadden describes the importance of communication and makes a plea for the resources necessary to give more people an opportunity to speak for themselves.

This book provides an overview of the past few years of the Augmentative Communication in Practice: Scotland Study Days. The immediate future sees the 1998 Study Day to be held in Cumbernauld on October 30th. This will focus on different perspectives on AAC with Adults. Planning is already under way for the 1999 Study Day, which will end the century with probably the biggest ever Augmentative Communication in Practice: Scotland Study Day.

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What is Augmentative and Alternative Communication? An Introduction

Sally Millar and Janet Scott

Augmentative and Alternative Communication (AAC for short) sounds very complicated – it isn't really! This chapter aims to demystify AAC.

What exactly does AAC or Augmentative Communication mean?

Augmentative communication means any method of communicating that supplements the ordinary methods of speech and handwriting, where these are impaired.

Some people with disabilities may not be able to use speech as their main means of communication, and may have to use special techniques. The idea of augmentative communication is to use to the full whatever abilities the communication impaired person does have, in order to bypass and/or compensate for areas of impaired function. With recent technological advances and an increasing awareness of the range of communication options open to individuals with a wide range of disabilities, the potential is there to provide more and more people with an improved level of communication.

Although there are times when we all may use aspects of AAC (for example gesturing across a noisy pub to a friend for a drink, pointing to a picture or gesturing when trying to make yourself understood in a foreign language), some people rely on AAC all the time. AAC is used in all sorts of settings – wherever people need communication: family homes, in nurseries and pre-school settings, in schools, colleges, and in Higher Education, in hospitals and intensive care units, in Day Centres, in residential homes.

AAC has the potential to greatly enhance the quality of someone's life. *"The joy of being able to write again and keep in touch with old friends ... is tremendous. Having the security of knowing I will always have some way of talking to those closest to me is too wonderful to describe."* (Macdonald, 1994).

AAC can allow an individual to participate more fully in society, by providing him/her with a greater level of independence. McFadden (1995) *"... to me and others like me being able to communicate puts us into society. It lets us have a voice. ...For me having a Liberator has changed my life completely."*

AAC can enhance an individual's access to learning and educational opportunities: *"Using the BIGmack has been very beneficial. It has allowed him to participate in various classroom activities and has helped to strengthen his understanding of symbols by adding speech to them."* (teacher of children with profound and complex learning difficulties).

Do 'AAC' and 'AAC system' mean the same thing?

One is the overall concept (AAC), the other is a specific example of the whole (AAC system).

The term 'AAC' includes four interlinking strands:

- the **communication medium** – how the meaning of the message is being transmitted. This can be 'unaided', for instance by using gesture, facial expression, signing, etc., or it can be 'aided', where the person communicates using some sort of device other than their body, for instance via a communication chart, or an electronic device with speech output.
- a **means of access** to the communication medium – this may be via a keyboard or touch screen, or by using a switch to scan from an array of letters / words / pictures.
- a **system of representing meaning** – when people speak, their meaning is represented by spoken words which act as 'symbols'. Where a person is unable to speak, their meaning has to be represented by a different set of symbols. These symbols may be traditional orthography (letters / words), or it may be a set of pictorial symbols (e.g. Picture Communication Symbols)
- **strategies for interacting** with a communication partner, for example being able to start up a conversation, or to sort things out when the other person does not understand.

adapted from RCSLT, 1996

An augmentative communication **system** means the 'package' of techniques and technologies that makes up 'total communication' for a specific individual. Typically, an individual might use their facial expressions, body postures and gestures, eye-pointing, vocalisations with different pitch and tone, and speech attempts; they might also use a more specialised system such as signing or symbols, and/or computer-based message storage with text-processing and synthetic voice output.

Each individual's augmentative communication system will be personally customised and thus each will be different in important respects such as the specific device chosen, method of access / operation, the settings, the type of overlay, the particular vocabulary available, and the way messages are built up etc..

What's the best form of AAC to use?

There's no such thing!

That's like saying "what's the best car?" or "what's the best food?". It depends on personal tastes, and on personal needs, as well as on each individual's situation and abilities and disabilities; it will be different for different people. Specialised assessment will help to identify the most appropriate system.

Most AAC users use a number of different forms of AAC – a *mixture* of unaided and aided communication systems, and a mixture of low tech and high tech aids – depending on the situation.

Unaided Communication

This term is used for an augmentative method of communication which does not require the use of any additional material or equipment. The biggest advantage of gestures and signing is that they are, precisely, unaided systems, and thus wonderfully quick, immediate and practical – you can't forget to take these systems with you; you can use them wherever you are; you don't need any expensive or cumbersome equipment; they can't break down.

Gesture is often used loosely to include the whole range of expressive things we can do with our bodies, such as facial expression, eye gaze, and body postures, and might include some mime-like movements and signs. At the simplest level, gesture is intuitive to everybody, and often immediately intelligible. It may be used by people with profound difficulties. More sophisticated gestural codes can also be developed. The disadvantage of gesture for transmitting information is, as Michael Williams (1994), who is himself an AAC user, says:

"gestures can get you a cup of coffee in the morning, but they do a poor job of telling your friend about that delicious piece of cake you had the other night. Gestures can only express things in the here and now. Also, gestures are poor candidates for expressing things like truth and beauty."

Signing is a much more sophisticated form of communication (and as such, is a whole specialist area in itself, which is beyond the scope of this book). There are a number of different forms of signing – some use restricted numbers of signs as a support for speech, while at the other end of the scale, others provide complex and powerful language, with enormously rich expressive capabilities. While signing is of course a primary AAC choice for people with deafness and hearing impairment who live in a 'signing world', it is not always quite as useful for people with other communication difficulties. The disadvantage of sign language is above all that not everyone in the communication impaired person's environment – in fact, sometimes hardly anyone – may sign well themselves or understand sign to any very advanced degree. Staff need continual training in sign. Furthermore, many people who need augmentative communication systems have some degree of physical and/or neurological impairment, which may make the formation of recognisable signs physically difficult.

Aided Communication

This term refers to systems which involve some physical object or equipment such as symbol charts or books, or to computers or voice output communication aids (VOCAs). An aided communication system can be something very simple (e.g. the alphabet written on a plain post-card) or it may involve a highly sophisticated microelectronic system specially programmed with a large vocabulary.

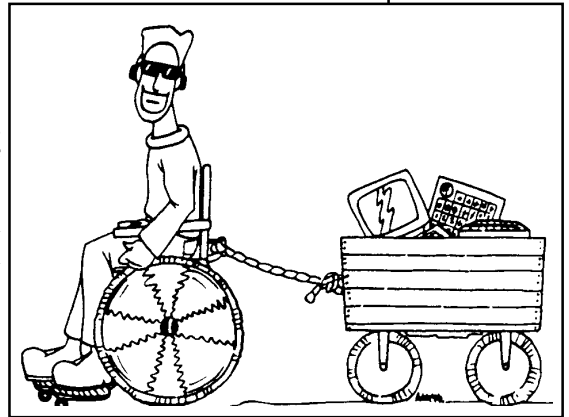
Advantages of Aided Communication Systems

The biggest advantages of aided communication are the flexibility and the richness of communication that can be achieved by creating and/or customising vocabulary sets; employing sophisticated methods of storage and retrieval; and providing users with special means of accessing them, if necessary. Aided communication can be used by very young children, non-readers, and individuals with severe intellectual and sensory disabilities, as many are based on simple pictures and symbols. Systems based on alphabetic symbols, for those who can use them, give access to a limitless range of communication. Low tech systems can be very quick and simple to use. High tech aids can be designed for operation by a very minimal movements (e.g. a single switch press), so can be accessible to individuals with severe physical disabilities. Rate enhancement techniques may be included in the design of an electronic aid, to try and help users approach a more normal speed of communication. Voice output increases users' independence. Use of high tech systems greatly increases the range of types of communication available (e.g.. group discussions, phone use, use in employment, connection with other computers, email, 'chatting' on electronic Bulletin Boards, etc.) above

and beyond personal face to face communication .

Disadvantages of Aided Communication Systems

The biggest disadvantage of aided communication is the equipment itself. Having to remember and carry objects around with you, inevitably means something can get forgotten / left behind / lost / broken. Sometimes equipment can be bulky, or heavy, and often it may be very expensive. If the communication equipment is electronic, there may be a need to keep track of wheelchair mountings, battery rechargers or spare batteries, on top of the basic equipment – and there is always the spectre of technical failure. (For this reason, it is vital to have a) a non electronic back-up, and b) insurance.) Another disadvantage, to the user, of high tech aids is that acquisition of a sophisticated piece of technology may set up unhelpfully unrealistic expectations of ‘instant success’.



The Technological Continuum

What's 'Low tech' ?

Anything you could use in a tent, with no power points or spare batteries anywhere – i.e. anything that doesn't involve electricity or electronics.

‘Low tech’ communication systems may take many forms, and are discussed in more detail later in this book, in Chapter 2. ‘Low Tech’ systems might include, for example:

- tangible symbols (e.g. real objects, miniature objects or parts of objects, on an activity calendar)
- picture / photo boards or books
- symbol communication charts or books, topic boards
- letter, word or phrase boards
- communication cards (e.g. clipped on a keyring on a belt)
- eye-blink, or eye-pointing pointing codes
- ETRAN frames (fix pictures, symbols or letters, or a code to a frame in front of the user, who eye-points to the item they want to communicate.)

Features of a low tech system to look out for are the choice of *representational system*, (i.e. what kind of pictures, symbols or codes suit the user best) and the *method of selection* of items (e.g. direct pointing, saying ‘yes’ or ‘no’ when a helper points, switch use etc.).

What's 'High Tech'?

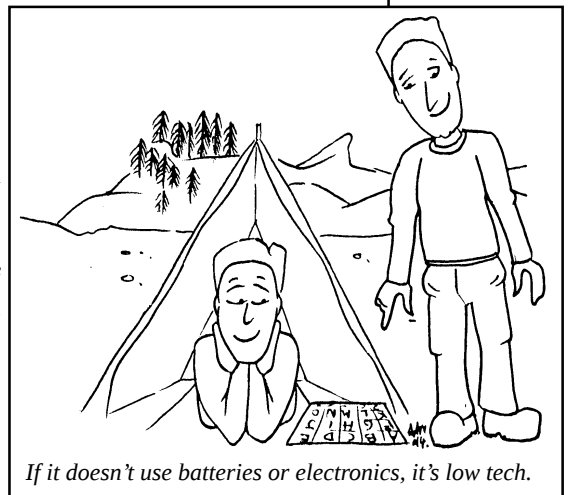
Anything using electricity / electronics

This category covers a wide spectrum, starting with very low ‘high tech’ devices (ie. which do contain some technological element, like a battery or a switch, but which are very simple). For example:

- pointer boards (hit a switch to stop the pointer going round, when it's at the object / picture / symbol required)
- switches connected to battery-operated toys or simple environmental control devices such as attention-getting beepers, cassette recorders, single message tape-loops or other simple message players
- switches connected to a ‘Mains Switcher’ to allow a user to control things like a television, or lamp
- toys or books that speak when certain areas are pressed.
- simple, single message devices such as the *Big Mack*

Specific high tech systems will be discussed in detail in another part of this book. Features to look out for in high ‘high tech’ communication systems would include:

- portability and robustness
- range and type of possible input methods (keyboard? overlay keyboard? switch input? a range of scan options?)



- type of screen display (none; static, displaying only text; dynamic, displaying symbols)
- techniques used to store and retrieve messages
- output (transient or permanent? (what type of screen, if any? digitised voice? synthetic voice? text? hard copy printout? storage on disk?))

'High tech' communication aids vary also in the degree to which they demand of the user more or less sophisticated techniques of visual perception, memory, sequencing skills, language processing, meaning associations, grammar or encoding.

Who can benefit from AAC?

Numerically, small numbers of people – probably less than 1% of the population. But although that percentage sounds small, that's still hundreds of thousands of people in the UK. Worldwide, it adds up to millions.

There are no reliable figures on the number of people currently using AAC in the UK. The total figure might be dramatically increased if we included people who *might* benefit from AAC (but who have not been assessed or provided with AAC), and people with severe hearing and visual impairments.

However many or few, communication is a really important issue for each individual. The less speaking ability a person has, the greater their need for augmentative communication. Some people will need AAC as their main means of expressive communication, lifelong, because of congenital physical or language disability. Some will come to use AAC later on because of acquired disability, through accident or illness. Others may require AAC techniques only occasionally, to clarify or expand upon spoken messages or in particular situations. For some, AAC may be only a transitional stage in the development, ultimately, of speech. Some people can speak adequately, and need AAC only for writing tasks.

There is no single medical condition that indicates (or, for that matter, contra-indicates) the use of augmentative communication; AAC is a functional, not a clinical definition of a set of helping strategies that can be learned by people of all ages, with a wide variety of conditions. For example, users of AAC can be found amongst people with cerebral palsy, complex cognitive disabilities, specific speech / language disorder, stroke, head injury, motor neurone disease, multiple sclerosis, profound and multiple learning difficulties, Freidreich's ataxia, autism, spinal cord injury, and more.

The narrowest definition of AAC refers only to speech aids for people who can't speak clearly. The wider definition, which we use here, includes writing aids for people who can't physically write as a form of AAC. Many individuals can neither speak nor write so an ideal AAC system would include speech and writing aids integrated within the same system. Other individuals may speak adequately in the 'here and now', but will need to use AAC for writing tasks e.g. to access the curriculum in education, to record their work in class, or to enter or keep employment.

A special group is people who use a full-scale sign language. People with deafness or hearing impairment who sign are said to be using sign language as an **alternative** method of **communication** in that sign is usually their first or main language and often totally *replaces* speech. (Whereas most other communication impaired people are *supplementing* their existing speech attempts, sometimes with sign along with other systems, and are said to use augmentative communication.)

Blind or visually impaired people who use Braille or Moon and/or technology based on these systems may also be thought of as using a specialised form of augmentative and alternative communication, although this does not usually fall to AAC specialists to teach, but more often to specialists in visual impairment.

What level of ability does someone have to have, before AAC is a possibility?

None. There are no prerequisites to the use of AAC. AAC should be introduced as early as possible.

No one is too disabled to be able to benefit in some way(s) from augmentative communication techniques and technologies. The whole point about AAC is that it offers a *new* way of doing something. Rather than waiting until someone has failed with other approaches, AAC should be introduced as early as possible. The fact that a young child cannot apparently recognise and reliably pick out pictures does not mean they cannot use a voice output communication aid. It may mean that they need the aid to help them learn to associate the pictures with the words, through the supportive and consistent feedback of hearing the name of the picture spoken out each time they press it. People learn to communicate *by communicating* in meaningful situations – not by working up high test scores on apparently unrelated tasks such as picture matching.

No one is too disabled to be able to benefit in some way(s) from augmentative communication techniques and technologies.

Naturally, different people use different types of systems, and at different levels, depending on their age and stage and upon the pattern of their strengths and needs. For example, some individuals with complex multiple

disabilities may benefit most from use of technology to enhance their attention-getting, mobility and play – and thus interaction – before a ‘formal’ communication system as such is introduced. (They may have learned a lot of transferable skills useful for communication, such as switch use, cause and effect, and selection from an array of choices, from the earlier activities.)

How easy is it to integrate use of AAC into Education and Everyday Life?

This is the really ‘key’ question!

In fact, identifying the most appropriate augmentative communication system and even finding the funding to purchase it, for a user, is often the easy bit. Implementing effective use of the and integrating use of the system into daily life at home, school, or work can prove to be a difficult and a long term task. Recent work underlines the fact that

“Mastery of a particular codedoes not ensure that the individual user will function as a competent communicator. Provision of an expensive communication aid will not ensure that it is used in a versatile and truly interactive way”

(MacDonald & Rendle, 1994)

Whose Responsibility is AAC?

Everybody’s. It’s not just the job of the speech and language therapist. A co-ordinated approach is vital.

For someone to learn and use AAC effectively, it needs to be part of everyday life, not a ‘task’ done occasionally. Communication doesn’t happen in isolation. Each person using AAC will have a network of people around them – some with a formal remit to ‘work’ on communication and others who have communication links with that person on a more personal, social, work related or educational level. Murphy et al (1994) found that most of the people in their study could identify a group of individuals who had some communication remit in their work with the AAC user – however within each group there was confusion as to who the other members were, and the role of each.

For someone to learn and use AAC effectively, it needs to be part of everyday life, not a ‘task’ done occasionally.

AAC Team

For AAC to be maximised there needs to be more co-ordination (Murphy et al, 1996), with someone with a clearly identified lead role (possibly, but not inevitably, a Speech and Language Therapist) acting as coordinator. The following people have a very important role to play, in helping the AAC system to function most efficiently, and to help the user learn to communicate effectively with AAC:

- Parents, families, spouses, friends
- Home and day placement carers
- Speech and language therapists
- Teachers and classroom assistants
- Occupational therapists
- Physiotherapists
- Rehabilitation engineers (or bio-engineers, electronic engineers)
- Computer programmers
- Volunteers
- AAC users!

What are the Key Features of a Successful AAC Programme?

There are many interlinking factors.

Assessment

Identifying the most appropriate communication medium, method of access and system of representing meaning can be a difficult task. The potential AAC user and their family, as well as other key people, need to be actively involved in the decision making process, rather than just having an ‘expert’ prescribe. It is important that the needs of the individual are met rather than the concerns of a third party, and so it is important to seek out assessment advice that is as professional and independent as possible. Obviously people’s needs and abilities change over time and AAC assessment should not be seen as a ‘one off’ event. Many people who have had communication difficulties all their lives will not be able to reveal their true potential until they have had access to a means of communication; they may need to work through a progression of AAC techniques as they develop their dormant skills.

Training

At least three different groups of people need training: *the person using AAC; the person co-ordinating the input to the AAC user; those other people with whom he/she communicates*

The person using AAC – It is all too easy to miss the obvious – the person using AAC needs to be taught. Learning to communicate by some augmentative means is at least as difficult as learning to speak a foreign language (Murphy et al, 1996) – that fact is rarely acknowledged. Obviously the actual amount required will vary from person to person – but everybody using AAC as their means of communication will at least have to learn the following skills:

- how to operate their particular ‘communication medium’
- how to use this in an interactive, *communicative* manner – and how to integrate this with their other ways of communicating, e.g. gesture, vocalisation etc.

Some people will also have to be taught:

- what communication actually is about
- a symbolic language system
- how to access their communication system, e.g. switch scanning skills

The person co-ordinating the input to the AAC user – There must be ongoing training and support so that they can keep up to date with changes in philosophy and teaching approaches as well as in technology. They also need to be able to train and support all the *other* people in the communication network. Staff move on, and children change teachers each year, so training needs are continual.

The other people with whom the AAC user communicates – They need to be involved and trained. Communicating with a person using AAC is different from communication between two naturally speaking people. Conversations are usually slower so more time is needed; conversations can easily become dominated by the ‘natural’ speaker as he/she is able to speak at a faster rate than the AAC user, and has had more experience of communicating; conversations tend to have more frequent misunderstandings when the natural speaker has not been able to understand what the AAC user is saying and vice versa. The use of basic social interaction skills (e.g. eye contact, gesture and timing) can be different in an AAC conversation. People need to be aware of these differences and of the skills required for successful communication.

Vocabulary

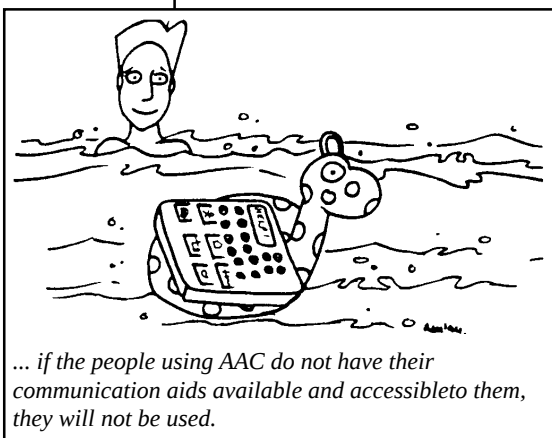
Some people who use AAC are able to spell out exactly what they want to say. For them vocabulary selection is not a problem. But, for the many people using AAC who have only limited reading and/or spelling, choosing the appropriate vocabulary for their communication aids / charts can be a challenge. It needs to be appropriate, and to change according to changes in interests, to new events happening, etc. It needs to reflect those messages and concepts that the person is unable to convey by other (perhaps more spontaneous) means. No one person will have all the knowledge required to select the vocabulary for a person using AAC. This task should be carried out by a number of people. The people who spend the most time in a variety of situations with the person using AAC are in a good position to have ideas about suitable vocabulary. Irrelevant vocabulary is one of the main reasons why an AAC system may be underused.

Access to AAC and Communication Opportunities

It may seem very obvious, but if the people using AAC do not have their communication aids available and

accessible to them, they will not be used. We are all familiar with communication charts and high-tech devices being kept in cupboards – perhaps to keep them safe, perhaps because they’ve been forgotten about, perhaps because they take up too much space, perhaps because they’re broken, perhaps Perhaps the person using AAC will *choose not to* use it all of the time, but if it is not there, if the person cannot see it or reach out for it then he/she can never *choose to* use it.

People with physical impairments may find it difficult to start up a conversation with their AAC aid independently and may need practical help – for example, someone to ensure that a battery operated device is charged up regularly, to help get a communication aid out of their bag, or switch it on, or to position / fix down their switch, turn pages in a communication book and so on.



Sometimes the environment needs to be ‘engineered’ somewhat, to offer *communication opportunities* to an AAC user, so that they can practise and get positive communication experiences. The use of ‘non-questions’ or closed ‘question and answer’ interactions (“I’m sure Henry wants a drink, don’t you Henry?”) needs to be reduced, if possible, and replaced by more exciting and open-ended prompts, and opportunities to make choices (“OK Henry, what time is it? What should we do now? a song? a bath? a drink? a peanut down the back of your tee shirt?”) – with plenty of time given to *expectant waiting* – i.e. assuming that the user can and will take up their communication turn, not that they can’t or won’t.

There needs to be new people to talk to and new things to talk about – a user may need trips to shops or cafes where s/he can ask for things independently; ‘buddy’ or group activities where they can meet and interact with non-disabled people of the same age; changes and continual new challenges in the daily routine so that the user *has to* use their system actively to stick up for themselves, ask questions or to demand things – as opposed to a dull routine where all needs are anticipated and there is no real need for communication.

Technical support

AAC technology is becoming ever more sophisticated. It is providing opportunities which could not have been imagined even a few years ago. People with severe disabilities are able to communicate globally on an equal basis via the Internet. Their disability is hidden unless they choose to reveal it; for once in their lives, the wheelchair or speech difficulty is not the only thing people notice about them. However this increasingly complex technology also brings its own problems. Even not-very-sophisticated technology also brings difficulties – for instance, switches break or fall off their mountings. Few of us working in the AAC field (at least therapists and teachers) have skills in soldering, wiring up switches, computer programming, etc.. It is very important to identify sources of ongoing technical help locally, as well as contacting the supplier of the high-tech aid. From the perspective of a person using very sophisticated AAC equipment (who also has a need for Velcro!) “*Don’t underestimate the importance of such help ...*” (Macdonald, 1994).

Time

One of the most important resources for the support of effective use of AAC is *time*. Not only do conversations with a person using AAC usually take longer than with a naturally speaking person, considerable time has to be found to learn about the AAC aid / technique; to teach the person using AAC; to coordinate / train / support the network of communication partners; for technical repairs / maintenance; and finally to sit back and reflect on progress and plan for the next step. Murphy et al (1996) argue that more time is needed for Speech and Language Therapists to work directly with people using AAC (and not just in the clinical setting – therapy needs to be taken out into the real world), and to train and support those other people in the communication partner network. For children in school, there can be a real conflict if the time available for delivery of the 5-14 / National Curriculum’ is *also* required for teaching them to communicate using AAC. Reid et al (1996) stress the importance of having time allocated officially for joint planning between teachers and therapists. Priorities have to be set and reviewed on a regular basis. Perhaps for some children learning how to use their communication aid will be the priority for a period of time, as this will give access to other aspects of the curriculum, which can then come to the fore at a later date.

Changing Attitudes

Blackstone (1991) argues that the quality of the interaction that takes place with a person using AAC is generally dependent to some extent on the kind of beliefs and attitudes the speaking partner has about people who have a disability. Attitudes toward people with disabilities are generally rather negative. Attitudes towards people using AAC (or who may be able to use AAC) need to be positive. If people seem to give out the message that AAC use is “too difficult” or “takes too much time” then it will not be surprising if the user appears unmotivated to use their system. The user needs to feel they are working in a positive environment where their AAC use is encouraged and valued.

There needs to be a realisation that the speaking partner has an important role to play in the process of AAC. For AAC to be successful, the person using AAC needs to be included actively in the selection and development of the appropriate form of AAC. They need to be asked what they want! Murphy (1996) quotes a Speech and Language Therapist who has found it essential to consult her clients when selecting the vocabulary for their AAC devices: “*I’ve found that my selection of vocabulary, what I thought was going to be most interesting, hasn’t actually been that accurate...with client led selection looking at the vocabulary that’s available ... I’ve found that I had a better response.*” Blackstone (1993) quotes a lovely example of the need to include the potential AAC user in the creation of their communication aid: a colour-coded communication overlay full of symbols had been made up for an adolescent boy. Much time and care had been taken over the task. One of the colours used was pink. The boy took one look at it and said “*You don’t expect me to touch pink, do you?*”

How can I get Advice and Information on AAC, or an AAC Assessment ?

Because AAC is quite new and specialist, not all teachers, therapists and Day Centre officers have acquired training in its use. If this is the case, and you think you or your family member or client could benefit from AAC, you could ask for a special assessment for AAC.

Anyone who already has speech and language therapy is half-way towards a referral for specialist help with AAC: all speech and language therapists have a 'duty of care' and professional standards which include the requirement that a non-specialist local therapist *"might seek to establish a joint assessment process with colleagues with special competence in augmentative / alternative communication. In certain circumstances the assessment process may result in onward referral to a specialist centre for augmentative / alternative communication."* (Royal College of Speech and Language Therapists, 1996, p.90)

In Scotland, each NHS Trust has a nominated 'Link Speech & Language Therapist' who takes special responsibility for AAC and is supported by regular contact from SCTCI. SCTCI will provide a list of the names and addresses of existing Link Therapists, who may be contacted directly. Your Link Therapist will be able to organise a specialist assessment for AAC

If there is no Link Therapist, or you are not sure of the procedure in your area, ask the local speech & language therapist about this. If there is no contact with a local speech & language therapist, try contacting the Headquarters of the Health Board for the area for advice. With the help of their Speech & Language Therapy Adviser, the Health Board will be able to clarify which NHS Trust covers the case of the communication impaired individual, and what is the appropriate point of contact for Speech & Language Therapy and/or specialist AAC help in that Trust.

A number of regions in Scotland now have centres or services specialising in AAC and/or technology for education. Even if the remit of these agencies does not allow them to 'take on' a particular child or adult client directly, they are likely to be able to suggest other possible sources of help or guide enquirers towards the appropriate procedures in their own area.

If there appears to be no-one locally who can help, a national agency such as SCTCI (all ages) or CALL (mainly for educational settings) can help to provide information and advice and sometimes assessment support. These specialist agencies will accept requests for help directly, and do not necessarily require speech & language therapy referral.

If you live outside Scotland, you may wish to contact one of the Communication Aids Centres or one of the ACE Centres (mainly for educational settings).

Who pays for 'High-tech' Communication Aids?

Yes, well, a good question.....

In spite of considerable efforts from the AAC field (National Paramedical Advisory Committee, 1997), policies on the funding of AAC equipment and services are still far from being established. It seems, unfairly, that the situation may depend to some extent upon where one lives and the age of the person needing the communication aid (and the time of year – budgets run out or have to be spent quickly).

If the person needing the communication aid is a child with a Record of Needs, and the communication system along with necessary support is specified in Part 4 of the Record (Statement of Special Educational Needs), the Education Authority will take responsibility either for itself funding the purchase of the necessary aid, or for arranging for funding jointly with other appropriate sources, (depending on the procedures that apply in different regions / Health Board areas). This alone is a worthwhile reason for persuading the authorities to open a Record on a child. It will then be very important to ensure that the AAC requirements are detailed very clearly and precisely in Part 4 of the Record (*not* in Part 5, which is where it is currently often placed, under 'Other Needs') (Scottish Consumer Council, 1989). The situation is similar with Statements, in England and Wales.

The terms in which the AAC system needed is recorded should be balanced somewhere in between an over-vague reference like "an AAC system" (which cannot be interpreted reliably and thus may never be implemented) and an over-precise reference (which ties the child for ever to some specific system that might quickly become unsuitable). The best format to use is something like *"a system of graphic symbols, implemented on a portable electronic voice output device with acceptable voice quality, storage capacities and a range of access methods similar to those currently available (1998) on the 'DeltaTalker'"*. It will be important too that the necessary speech and language therapy and other services to introduce and support use of the AAC system is also included in the Record under 'Educational Needs' rather than under 'other needs'. And that the Record includes provision for regular reassessment of AAC needs and upgrading of AAC system as necessary.

For non-recorded children (especially pre-schoolers) or adults, there may be arguments as to whether their need for an AAC system should be paid for by Health, Education or Social Work. Again, in many cases, an ideal solution is to try and arrange joint funding, and some authorities are starting to put in place joint agencies for this – but in other places it can take up a good deal of time and effort finding out who to write to and how to make sure everyone is in touch with everyone else. If the needs of an adult are being formally assessed under Care in the Community procedures it is important to ensure that their AAC needs (which may be highly relevant to other issues such as independent living) are assessed, recorded and specified clearly, so that Social Work Departments are obliged to make provision for these.

Students in Higher Education may be eligible for a Disabled Student's Allowance as part of a mandatory award or grant from the Scottish Office or from the Local Education Authority in England and Wales. From the academic year 1998-9, the Disabled Student's Allowance will no longer be means-tested. There are three types of allowance and students may be eligible for any or all of them:

- (a) Specialist equipment allowance (maximum payable for the whole course £3,955 for 1998-9) for purchase or lease of major items such as a computer.
- (b) Non-medical helpers maximum per year (£10,000 for 1998-9) for special helpers such as note-takers or sign language interpreters.
- (c) Miscellaneous Allowance – maximum per year (£1,315 for 1998-9) for expenditure not covered by the first two.

More information can be obtained from the Scottish Office or local education authority's Student Awards Section (Disabled Students Allowance) or by discussing the matter with the university Adviser on Disability.

Students on other courses in Further Education may qualify for discretionary 'bursaries' from their local education authorities or from the College to which they are applying, or even, in some cases, funding from their local Social Work Dept. In all cases, arrangements for applications through these sources should be set in motion as early as possible in the process of applying to college.

The fact of the matter is that currently many people still have to wait for many months, if not years, for the statutory services to provide funding for an AAC system – if they ever do – and many end up relying on friends, families and charitable donations and awards to fund purchase of their communication systems.

Conclusion

In summary, there has been, in recent years, exciting progress in the field of augmentative communication – in people's awareness and understanding; in the development of powerful and user-friendly technology; and above all in the development of the skills, confidence and increasing independence and assertiveness of people who use AAC. An excellent example of this is the person we know who has never been able to speak with their own voice, yet who is confident enough (and skilled enough) using their voice output communication aid to 'page' an unknown Speech and Language Therapist in a hospital at the other end of the country (having negotiated at least three levels of 'telephone receptionist'). As further evidence, you need look no further than some of the later chapters of this book where Scottish AAC users speak for themselves.

For users, AAC may be their means of accessing the rest of their lives. For those of us who are involved in helping people to use AAC, although it can sometimes feel as if it is taking up our whole lives, it is a privilege to work in this area. We have learned so much from the people we have been involved with and their families. As one carer put it, *"It's like being paid to go and spend time with my pals!"* We hope that this book will be a friendly and useful introduction for newcomers to the world of augmentative communication and its users.

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Low Tech Methods of Augmentative Communication

Janet Scott

What do we mean by 'Low-tech'?

How can technology be 'low'? What do we mean? In Chapter 1 we defined low-tech communication systems as "anything that doesn't involve electricity or electronics". Low-tech communication can be very 'low' – it can be as low, and non-electronic, as paper and pencil. However this does not mean that low-tech is in any way inferior to those methods of communication referred to as 'high-tech' (for an overview of high-tech augmentative communication systems see Chapter 6). Low-tech systems can offer the user a quick, powerful and highly flexible method of communication. Low-tech communication systems never have flat batteries, they don't need to be charged up and they tend not to mind falling down the stairs. Low-tech has a lot going for it!

How does a Person 'Speak' using a Low-tech Communication System?

Because there are no electronic parts and no batteries, a low-tech communication system does not give the user the option of speech output, neither is there visual output to a screen or printer. The person using a low-tech communication system relies on a technique which might be described as 'listener mediated' output. Basically the 'listener', or communication partner 'reads' what the augmented communicator is indicating and translates or interprets. The low-tech AAC user's communication is thus jointly constructed (or co-constructed) by both him/herself and the communication partner. Low-tech communication systems require both the user and their communication partner to be actively involved in the interaction. For many AAC users this joint construction with, and personal engagement of, the communication partner is one of the main benefits of using a low-tech communication system. The responsibility for achieving effective communication is shared, with the listener taking a substantial part in working out the final message. On the other hand, some other AAC users will not need or wish this level of inter-dependency with their communication partners.

Low-tech communication systems require both the user and their communication partner to be actively involved in the interaction.

Accessing a Low-tech Communication System

The user of a low-tech communication system must indicate, in some manner, to their communication partner which symbol, letter, word is being selected. This may be achieved simply by pointing. However, pointing may not be possible for a person with more severe physical limitations. There are many different techniques for accessing, or selecting, a symbol from a low-tech communication display.

Direct Selection

The AAC user directly selects the desired item from the communication display. We are all familiar with the concept of direct selection: we use this technique when we type a letter, key in to a cash dispenser, or simply point to an item on a menu. Pointing to, or touching, the required symbol on a display is a common method of accessing a low-tech communication system. This may be achieved most commonly by finger or fist pointing, however other parts of the body can also be used e.g. elbows, toes, feet. A technique of 'eye pointing' can also be used, where the person directs their eye gaze at the desired object or symbol on the display. Other AAC users may use light pointers (perhaps worn on a sweat band around their head) to access a communication display, while some may use head or mouth sticks or hand-held pointers. A light pointer is rather like an ordinary torch, but with a narrow red beam of light. (To be strictly accurate, a light pointer is actually a *medium-tech* access method, as it is battery powered. It has been included in this section on low-tech as it can be a useful means of accessing a low-tech communication display.)

Scanning

Although people tend to think of scanning in terms of electronic devices, it is possible to use scanning techniques to access a low-tech communication system. This type of scanning may be called *listener scanning*. The communication partner indicates, one by one or group by group, the items presented on the communication display, and the AAC user indicates that the desired group, then item has been reached by performing a pre-determined action, for instance eye blinking, or vocalising.

In the following examples, the accessing / selection technique is speeded up by use of non-electronic 'row-column' scanning methods. The first example illustrates a *manual scanning* system, while the second example involves *verbal / auditory scanning* by communication partners.

This is a revised and expanded version of a paper which first appeared in Augmentative Communication in Practice: An Introduction (1994)

Figure 1

Use this chart when you can't understand what Liz is saying. Point down the numbers on the left until Liz blinks, then along the line until she blinks again. This is the letter / word Liz wants.

1	A	B	C	D			New word
2	E	F	G	H			Start Again
3	I	J	K	L	M	N	
4	O	P	Qu	R	S	T	
5	U	V	W	X	Y	Z	
6	What	When	Who	Why	How		

The first example (See Fig. 1) is a simple communication chart that was developed for a retired teacher with motor neurone disease, who wished to chat and to dictate to her son poems she was 'writing'.

The second example consists of the instructions displayed on an alphabet chart developed by and for a young woman with 'locked-in' syndrome. These instructions give communication partners advice on how to 'verbally' scan Barbara's communication display.

"Barbara will indicate which row the letter is on by blinking 1, 2, or 3 times. You then say each letter in that row until she indicates, with another blink, that you have reached the correct letter."

(Unlike Liz, in the previous example, Barbara herself is able to initiate the scanning by indicating with a blink which row the letter is on.)

Coded

This selection technique can be used with either direct selection or scanning. In everyday life, we use a coded method of selection when we refer to a hill or town by its grid reference on a map. We also use a coded selection technique when we use numbers pre-programmed into the memories of telephones. Using a coded selection technique can allow the augmented communicator to access a much larger vocabulary than may be possible by direct selection. Common coding techniques use colours, numbers, letters or pictures as their indicators.

Figure 2 shows an example of coded access. The colours and numbers are displayed for the user, on their

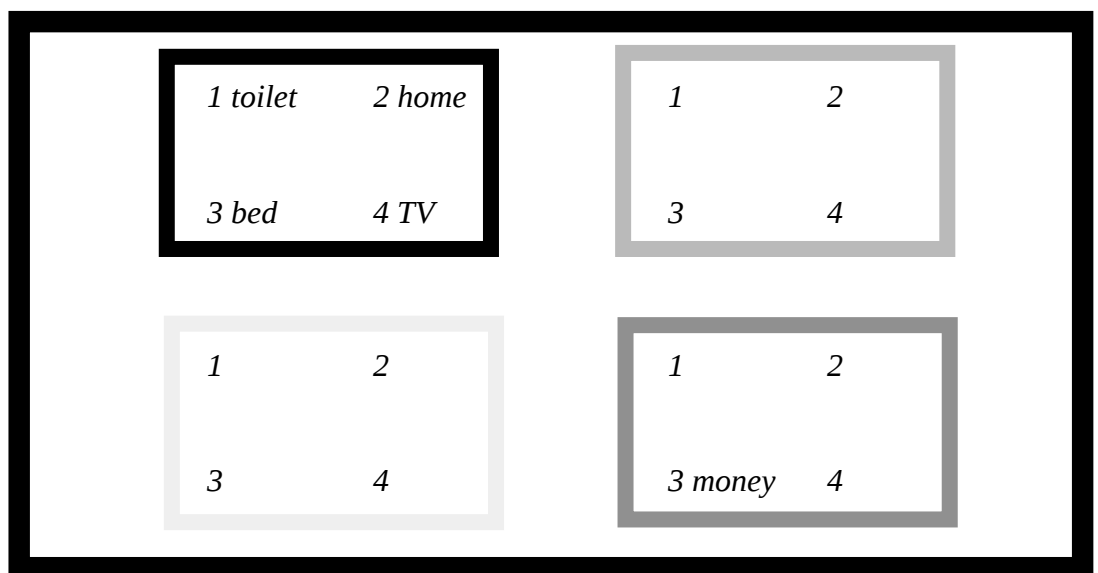
Figure 2

red 

yellow 

green 

blue 



wheelchair or on a chart, for example. To indicate 'toilet' the user would point (perhaps by eye or fist pointing) to *red:red:1*. To indicate 'money' the user would point to *red:blue:3*. This example has come from a communication book where each page has a coloured border. The first colour indicated refers to the specific page.

Using codes can also speed up communication, especially where the AAC user communicates via an alphabet chart. In this instance it is important to have the code and its associated message as part of the communication display to avoid both the AAC user and their communication partner having to remember either the code or its meaning. Examples of such codes, which were used on a text based communication chart, where the user would point to **H2** and the communication partner would understand that to mean "Hello, how are you?" or **CC** for "I'd love a cup of coffee".

The Representational Set (or, "what symbol system to use?")

The development of low-tech communication systems can be based on any one of a range of representational sets – for example, orthography (with letters and/or words on the display), graphic/pictorial symbols, textured symbols, photographic materials, 3-dimensional tangible symbols, (Rowland and Schweigert, 1989). The choice of symbol set is highly dependent on the needs and abilities of the prospective user and their communication partners. It may be desirable to combine different representational sets for a particular augmented communicator, e.g. having a combination of pictorial symbols *and* an alphabet on the one display.

Graphic symbols

Chapter 3 provides an overview of the different graphic symbol systems available. Any of the graphic symbol systems, e.g. Bliss, Rebus, Makaton, or PCS can be used in their standard forms, on low-tech communication displays.

Enhanced Symbols

In some cases, it becomes clear that a picture set provides an insufficiently rich language or concept base, and a more extensive symbol system may be a more appropriate representational set. However making the transfer from pictures to more abstract symbols can be a 'sticking point' for some people, and embellished or *enhanced symbols* can be useful at this stage.

The idea is to introduce enhanced symbols at the beginning, to aid early learning of the meanings of symbols, and to make symbol work fun and age-appropriate, but to gradually fade and withdraw these over time. Enhancements may also be used to highlight or draw attention to some particular *part* of a symbol, that is important to the meaning.

It may also be desirable to make symbols more eye-catching or visually interesting, for young children, or people with learning difficulties, by making their outline bolder, or more tactile, using strong bright colours, or textured material. Symbols can be drawn with puff-paint making them slightly raised; with glitter paint (or have glitter sprinkled over them) making them more 'interesting' visually; they can be made from sand paper or velvet, giving them a textured feel.

Tangible Symbols or Signifiers

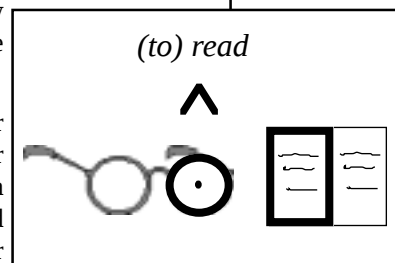
Some people with a communication impairment have difficulty making the representational leap from understanding an object or activity itself to understanding the meaning of a 2 dimensional symbol referring to that activity. They may need to use real objects or parts of objects.

First used with deafblind children by van Dijk (1967), such *tangible symbols* (the terms *signifiers* or *objects of reference* are also in common use) offer a transition to symbolic representation which can be of help to people who have memory difficulties, have limited use of gestures, are visually impaired or have severe learning difficulties or multiple disabilities. An example would be to use a swimming cap or pair of trunks – or, later, a small scrap of towelling – to mean "Time to go swimming now"; a scone cutter to mean "Time to do cooking/ baking now", and so on.

Signifiers place greater emphasis on perceptual rather than cognitive abilities, rely on recognition rather than recall memory, and place fewer physical demands on the learner. Aitken & Buultjens (1992) point out that the enhanced figure versus ground relationship offered by a 3D object can mitigate the effects of some visual and visual perceptual problems. For people with these problems, 2D symbolic systems are often not helpful.

Displaying a Low-tech Communication System

Various methods have been developed to store and display graphic symbols, text etc. for use as a low-tech augmentative communication system. Symbol displays may be designed for a variety of purposes, e.g. as



task specific topic boards, as a total communication system, as an instruction or recipe sheet. The purpose of the display will influence its format and design. There follows here a description – which is by no means exhaustive of some of the different formats for communication displays useful in everyday life.

- *Communication boards*: symbols are displayed on a 2-dimensional matrix. The physical size of a communication board (or chart) is usually determined by the physical ability of the user and his/her communication needs. It can sometimes also be determined by relatively arbitrary factors, such as the size of the wheelchair tray it is to be mounted on.
- *Communication or conversation books*: symbols are displayed on pages of, for example, photograph albums, ring binders, etc. Communication books can allow a large number of vocabulary items to be stored in a relatively small space, but can be awkward to use. Communication books containing a large vocabulary need to be well structured and laid out if they are to be practical (see section on layout of communication displays).
- *Topic boards*: a restricted vocabulary of symbols is displayed on a 2-dimensional matrix. The vocabulary set is task or topic specific, for instance the vocabulary required for interaction in a specific game, to tell a story, to take part in a home economics lesson etc.
- *Communication wallets*: symbols are arranged on cards and inserted into 'credit card' sleeves. Communication wallets are easily portable, but they can obviously only contain a relatively small vocabulary at any one time. They are also easier to lose!
- *E-TRAN frames*: symbols are displayed on a frame (rather like a window frame without any glass in it), typically made of perspex, wood or plastic (or cardboard!). E-TRAN frames are designed to be accessed by eye pointing.
- *Symbol mats*: Murphy (1998) describes using textured doormats (or carpet tiles) as a temporary communication display. The symbols are attached to the doormats with Velcro™, and can therefore be moved around by the AAC user and/or communication partner. Having a non-static communication display can make it easier for an augmented communicator to discuss issues which are not "fixed", e.g. fears, anxieties, hopes, likes, dislikes, etc..
- *Symbol hankies*: Symbols can be drawn in indelible ink on a cloth hanky. This is obviously a highly portable solution.
- *Symbol clothes*: The use of "eye gaze vests" by communication partners is described by Goossens (1989). Symbols are displayed on a specially adapted tabard, apron, baggy tee shirt or suchlike worn by the communication partner. (Symbols may be attached by velcro tabs, slotted into transparent 'pockets', drawn on cloth 'boards' that fold down etc.). The AAC user eye points to the desired symbol (or may use fist pointing etc.) Using an eye gaze T-shirt leaves the communication partner's hands free (she or he does not need to hold up the communication display for the user).
 Symbols can also be worn in similar ways by the AAC user, making communication displays highly portable. It is important to note that if worn by the user, or on flaps that fold up and down, symbols may need to be upside down (like a nurse's watch) so that they are in the correct orientation for the user to see and point to.
- *Symbol sweat bands*: Symbols are attached by Velcro tabs to wrist sweat bands. This is a highly portable solution, but obviously only for a limited vocabulary. This type of display tends to be used for a basic vocabulary e.g. *yes/no, toilet / not well*.
- *Tangible symbol displays*: Tangible symbols or signifiers may be stored in a communication 'box', or on an activity shelf. They may be used on *tactile calendars*, where, instead of isolated signifiers, a series of signifiers – each referring to a different activity at a different time of the day – can be placed on a wall-board. Using this system learners can begin to anticipate what is to happen next in the day and to communicate about things that have happened before that day – going beyond the here and now.

Methods of displaying a low-tech communication system are endless – and are limited only by our imagination!

Layout of Low-tech Displays

The previous section gives some examples of low-tech communication displays. It is important, however, to think about *how* and *where* to place the symbols on the communication board. Decisions about the organisation of the display are frequently based on the potential user's physical and visual abilities. Mirenda (1985) provides examples of different layouts of communication books designed to take into account the user's skills in:

- visual scanning

- visual attention
- motor planning
- figure-ground perception

Blackstone (1990) also highlights the need to think about the location of core vocabulary symbols on multiple displays (e.g. if the AAC user has several topic boards – is there a need to include core vocabulary on each board?), the relative size of the symbols and words, the mechanism for adding vocabulary. To be functional a low-tech communication display needs to be dynamic, that is, able to be changed and updated regularly. Designing a communication display is an ongoing process; new relevant vocabulary must be made available quickly, while out of date vocabulary needs to be removed.

Blackstone (1993 a) describes the purpose of a communication display as being to

“arrange language in space so individuals can, by selecting from the available options, say what they wish to say as quickly as possible, and can do so with a minimal amount of effort.”

To allow the AAC user to achieve this quick and easy communication there needs to be a structure to the organisation of the vocabulary. In the same article Blackstone has outlined six types of organisational arrangements currently in use in communication displays. The first four can be viewed within a cognitive framework, while the last two take into account the individual's lifestyle and preferences and the influence of the partner on the communication.

- *schematic*: biographical groupings based on experiences, for example photo albums and conversation books.
- *taxonomic*: groupings based on categories, for example topic boards, indexed communication folders.
- *semantic-syntactic*: groupings based on some knowledge of grammar, for example communication charts laid out in a Fitzgerald key (people / sentence subjects-actions-describing words-sentence objects).
- *alphabetic*: groupings based on the alphabet, for example alphabet boards, word lists arranged alphabetically.
- *frequency of use*: grouping frequently used words / symbols / letters together in a manner that allows them to be accessed quickly and easily, for example a semi-circle array of symbols for a person using a head pointer, key vocabulary items displayed in a credit card wallet for ease of transportation.
- *partner influence*: arrangements based on the needs and orientation of the listener, for example picture charts with the accompanying text 'upside down' for the user but the 'right way up' for the communication partner, displays with instructions for the listener highlighted.

The types of display outlined are relatively permanent. Murphy's *Talking Mats* and some uses of Tangible Symbols allow for the augmented communicator to interact directly with the symbols, changing their position, removing them from the display, etc..

In summary, then, the best low-tech communication displays are where:

- the AAC user is involved in the vocabulary selection process and the design of the display.
- the display takes into account the AAC user's physical, sensory, language and learning abilities.
- the display is organised (e.g. by frequency of use, by topics, alphabetically).
- the organisation is made explicit, e.g. by the use of colour.
- the design is also appropriate for communication partners to use easily, with clear instructions for use.
- the display is attractive and reflects the personality, interests and age of the user.

(adapted from Blackstone, 1993 b)

Cost Implications of a Low-tech Augmentative Communication System

Designing and constructing a low-tech communication display requires time; developing and maintaining it are ongoing processes. When we think of funding issues in relation to augmentative communication we tend to think of funding in relation to expensive high-tech aids. There is little information about the cost implications of introducing a low-tech communication display as, in most cases, this is absorbed by the service provider (usually the speech and language therapy service). Blackstone (1993 c) asks what the true cost of a low-tech communication system is, in terms of materials and time. Time is certainly needed to develop the communication display, to update it and repair it. However time is also required to teach the AAC user how to use his/her low-tech display for maximum communicative effectiveness. Time is also required to teach

communication partners how best to interact with the AAC user. It is not sufficient just to provide someone with a communication book and hope that he/she will use it. People, both users and their communication partners, need to be trained. 'Low-tech' is therefore not necessarily 'low-cost'!

Low-tech in Perspective

This overview of low-tech augmentative communication systems describes what they are and how they might be used. A low-tech system can be a very powerful method of communication. For some people, low-tech can provide the *only* means of communication possible; for others low-tech can be a useful adjunct to their own speech and/or high-tech communication aid.

Murphy (1993) interviewed 35 AAC users and 186 communication partners about their views on the advantages and disadvantages of different AAC systems. Many of the advantages of low-tech communication systems identified in the survey have been described already in this chapter, for example: flexibility of symbols, involvement of user and partner in updating topic boards, back up to high-tech, 1:1 attention from communication partner, easy to repair and maintain. However she also identified several perceived disadvantages, for example: lack of voice, communication partner needs to know and interpret the symbols, easy to ignore the AAC user, difficulty in communicating with friends who are disabled.

No one technique or system of augmentative communication is intrinsically better, or worse, than the others. What is important is that the AAC user has available to him or her all the appropriate technology – be it high, medium, or low-tech – and the relevant support and training to allow him or her to communicate in as effective a manner as possible.

Two examples illustrate this point; both are young men who use *TouchTalkers* as their main means of augmented communication, with low-tech systems as back-up.

One, a student at a F.E. college, had to explain to a lecturer how to set up his *TouchTalker* and computer for word-processing. Physically he was unable to do it, although he knew what needed to be done. The lecturer, who had never had to do this before, was blind. Without the voice output on the *TouchTalker*, the student would not have been able to give the lecturer instructions – his low-tech alphabet chart would have been of no use to him in this situation.

The other young man prefers to leave his *TouchTalker* behind when going out to a restaurant or a cinema with his girlfriend – he appreciates the privacy his 'silent' *Blissboard* gives him in these types of situations.

Low-tech communication systems are important!

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Symbol Systems

Alison MacDonald

Introduction

Before describing and comparing symbol systems used by the non-speaking population in Great Britain there are one or two issues that are worth discussing. The first can be illustrated by an anecdote as follows:–

In the summer of 1993 I spent a week in the Czech Republic giving talks on Augmentative and Alternative Communication, amongst other things. One day, after a large lunch at the Ministry of Education, a colleague and I were preparing for our afternoon presentations. We looked around for the toilets. Ahead were two likely-looking doors, one marked 'Z' and the other marked 'M'. My colleague looked desperate. Suddenly I remembered that I had with me some overhead projector sheets of basic Blissymbols carefully translated into Czech. I looked these out and we found the following:



muž



žena

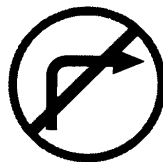
With great relief my female colleague rushed confidently in through the door marked 'Z'.

The important point here is that letters of an alphabet are only meaningful to people who speak and read the language to which the letters are referring. Spoken or written words do not hold universal meaning, but only act as a reference system for people who have learned that particular language. There is nothing in the sound or shape of the word 'žena' that would help non-Czech speakers to guess that it meant 'woman'.

To illustrate this further, most British travellers in Greece would have difficulty interpreting the street sign,

Απαγορεύεται η στροφή δεξιά

without it being accompanied by its international symbol,



In this case, not only are the words less universally understood than the symbol, but the alphabetic system is unfamiliar too. As children, most of us are lucky enough to learn to read and write our own language without too much difficulty. It then becomes hard to remember what it must be like not to be able to cope easily with the written word. It is only when faced with an alternative alphabet such as Greek or Arabic script that we remember just how arbitrary the shapes which represent the sounds of our language are. There is no reason why 'M' should represent a humming sound made with closed lips, or the shape 'F' should stand for a hissing sound with the upper teeth on the lower lip. An important aspect of augmentative communication symbol systems is that the shapes attempt to directly represent the meaning of the concept behind the word without resorting to the highly abstract level of sound relationships.

These illustrations may help to explain why it is that many non-speaking children are able to cope with learning what at first may appear to be quite complex symbols, despite persisting difficulties in reading and spelling. They are able to make the link between the symbol and the idea or object that it represents without having to add on a whole extra level of sound-letter relationships that make considerable extra cognitive demands on them.

The ability to read and write is a cultural expectation in the Western world and, as such, an important skill in the development of independence, personal esteem and in the pursuit of learning. There are, however, many children who as a result of the brain damage underlying their disability will find reading extremely difficult. Some may never learn to read while others may advance towards reading readiness very slowly. It is for these children and adults that communication through some means other than the conventional written or spoken word becomes imperative. There is no evidence that the introduction of a symbol system will hinder

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the development of reading skills and indeed many would argue that there are several underpinning skills towards reading that are positively encouraged by the use of a symbol-based system (James 1993; McNaughton 1993).

The History and Development of Symbol Systems

The use of symbol systems as a substitute for speech or as a support for poorly intelligible speech began to develop in the 1970s, initially with the development and extension of Blissymbols from the original work of Charles Bliss. As the success of the early symbol users began to become apparent and its use began to spread amongst the non-speaking non-reading physically disabled population, the need for such graphic systems was increasingly recognised and other systems were developed to fulfil the needs of those potential users with more severe learning difficulties.

These graphic or 'aided' systems are now used fairly extensively throughout the world and new developments have taken place in different countries to fulfil their own particular cultural and linguistic needs. As already discussed, the symbols represent meanings, not sounds, and therefore, while the vocabulary available in a system will reflect cultural needs to some extent, the systems are not restricted to a particular language. From a practical point of view, however, it is usually easier if one has access to dictionaries in one's own language.

There are quite a number of popular and fairly versatile communication systems which have been developed in the English-speaking world, mainly in North America (e.g., PCS, Picsyms, Bliss), the United Kingdom (e.g., Rebus, Makaton, Sigsymbols) and Australia (e.g., Compic). In Britain, some of the most widely used systems are probably Bliss, Rebus, Makaton (in which the early vocabulary is taken from Rebus) and PCS (Picture Communication Symbols). These are the main systems that will be discussed here. Many communication aids can be used with a range of symbol systems, but some come with their own set of symbols. *TouchTalkers* were originally designed to be used with Minspeak symbols and *DynaVox* uses Picsyms (renamed Dynasyms). These systems will also therefore be discussed.

Some Important Features of Symbol Systems

It is important when deciding on a system for a particular individual not to be too easily influenced by external factors such as the system that several other users are using, or the one for which there already happen to be teaching materials on the clinic or classroom shelves. Each potential communicator will have his own individual strengths and needs and these must always form the central part of the decision making process. All systems have their particular advantages and disadvantages and these must be matched to the cognitive, linguistic, sensory and physical abilities of the candidates. For some this will mean that a simple, concrete, picture-based set which may not have much flexibility and potential for expansion but is highly transparent (guessable) will be suitable, for others it may be particularly important to offer a system that has the potential to grow with the user and to convey a wide range of abstract concepts and fairly full grammatical structure. When looking at systems, therefore, we need to look at their:

1. **Construction** – visual clarity and ease of reproduction. Many people with physical and learning difficulties also have visual perception difficulties. Creators of symbol systems need to consider the best way to clearly depict each concept without making the resultant symbol too busy and perceptually confusing. Also, while symbol communicators may be physically unable to draw the symbols themselves, it may be worth considering whether it is useful if the instructors and carers can quickly and easily draw out the symbols e.g., to write up the user's news, caption his work, etc..
2. **Level of symbolic representation** – the degree to which the symbols effectively convey the concepts they represent and the level of iconicity in the representations. These strands are not always compatible, as the more pictorial (iconic) symbols tend to depict one particular example of a meaning only, e.g., if the word 'to save' is depicted by a pictorial symbol of coins dropping into a money box then this cannot effectively be used to mean *to save from drowning*. A slightly more abstract symbol representing the concept, *to keep for the future* would validly convey the whole meaning of the word. This is an important point that needs to be considered when matching particular individuals to appropriate symbol systems. As stated by Sevcik, Ronski and Wilkinson (1991):

"With symbolic representation, the freedom from an image-based referent increases the power for generalisation and permits the user to move beyond direct correspondences between the medium and its representation to broader internal representations."

The extent to which a potential symbol user will be able to learn less concrete symbolisations, however, will depend on his or her developmental level (see Appendix).

- 3. Flexibility** – the potential for vocabulary expansion and grammatical structure, i.e. the ability to generate new meanings and to convey shades of meaning on a chart with an inevitably limited vocabulary selection. For example, the symbol for drink on a particular user's chart may usually be interpreted as 'I want a drink'. In order to convey information such as, 'I had a drink on the outing', or 'I don't like orange juice, I prefer Coca Cola', he or she needs to have access to specific symbols such as a Past Tense indicator, Negative, and ways of indicating more specific information concerning the drinks.

Symbol Sets and Systems

Augmentative communication systems vary along a continuum from simple, finite sets of pictorial symbols to fairly flexible and linguistically more sophisticated systems (Vanderheiden and Lloyd, 1986; Schlosser, 1996). The former may be of particular use to people with severe learning difficulties or a severe acquired language disorder in that they usually consist of fairly clear, concrete pictures with which everyday needs and wishes can be conveyed. Ease of recognition (often described as 'high iconicity' or 'transparency') reduces the cognitive load imposed in learning the symbols. They do not, however, have clearly defined rules for expansion of vocabulary and grammar to allow ideas such as verb tenses, descriptive terms or spatial concepts to be conveyed and do not easily join together to form sentence sequences. At the other end of the symbol continuum (but still considerably easier to learn than the sound-based representation of meaning found in traditional orthography) are systems such as Blissymbols which allow a wide range of meaning, both concrete and abstract, to be conveyed and which have the potential for personally constructed grammatical sequences with which higher functioning non-readers can participate in quite high level communicative interaction.

The simplest level of **picture sets** will often be home-made, either photographs or clear, coloured pictures. Commercially produced sets such as **Pick 'n Stick** stickers (from Winslow) are also available and have an alternative black-and-white version that might be more suitable for some adults.

There are several pictographic symbol sets and systems which could all be said to offer a relatively similar basic level of pictographic representation. These are Rebus, Makaton, PCS and Picsyms. These have, however, all been expanding recently and not all in the same direction:

Picture Communication Symbols (PCS) (available from Winslow, Boardmaker software available from Don Johnson) consists of three large ring-binders of around 3,000 symbols. These are divided into sections headed Social, People, Verbs, Descriptive, Nouns and Miscellaneous and a few on Food and Leisure. On the whole, the symbols are clear with some objects depicted as black silhouettes, but some are fairly busy, visually, and some of the vocabulary seems very American. Auxiliary verbs (e.g., is, was, had, did) are not included and there are no rules for marking tense. Strictly speaking, therefore, PCS is a large symbol set, rather than a rule-governed system. PCS, however, provide the library of symbols that comes with Boardmaker software, in which they are available in either colour or black and white. The conversion of the symbols into colour has greatly increased their visual clarity and the versatile nature of the Boardmaker program has made these symbols a popular choice for a range of uses beyond the production of communication charts. They are increasingly being used to support non-readers, who are not necessarily non-speakers, e.g. on symbol timetables, environmental labels, symbol posters and instruction sheets, and in a wide range of speech and language therapy intervention materials.

Rebus (Rebus Glossary available from LDA, Rebus software from Widgit) was developed in this country from the original American Peabody Rebus Reading Programme. A glossary with supplement, of about 950 symbols in total, has been available for many years. Recently a working group has been expanding the system to include vocabulary for topics such as Cooking and Shopping, Personal Care, the Outdoor World and various aspects of the National Curriculum. There are currently over 1,600 symbols available in a computer software package for Archimedes and PC compatibles. The symbols are clear and simple on the whole. The working group are open to ideas for new vocabulary from professionals around the country (contact Widgit Software) and have a flexible attitude to personal extensions for individual needs.

Makaton Symbols (available from Makaton Vocabulary Development Project) were originally based on the Rebus Glossary. Almost all the original 350 symbols are therefore the same as Rebus. Recently the Makaton Vocabulary Development Project has also been extending its range of symbols to allow access to the National Curriculum. Currently the subject areas covered are English, Maths, Science, Geography, History and Technology. The symbols are clear and bold, but attempts have been made to represent some fairly complex vocabulary and the resulting symbols are often extremely abstract and specific e.g., to maths or science. There are about 1,000 symbols in total at present.

Picsyms (available from Winslow Press) were originally produced in a book containing around 840 symbols. These have a fairly systematic logic underpinning the representations and guidelines are suggested for personal development of further vocabulary. The conventions used, however, can at times reduce the visual clarity of the symbols making them somewhat perceptually confusing, for example, the major focus of the symbol is often depicted in continuous lines against a background of modifying information depicted in dotted lines. The Picsym vocabulary has been extended to provide the Dynasyms used with the DynaVox range of speech output communication aids.

At a slightly higher level of symbolic representation is Bliss:-

The Blissymbol Communication System (available from Blissymbol Communication UK) originates from the work of Charles Bliss whose intention was to create an international written language that could be used for a number of trans-linguistic purposes. His work has been developed and expanded from headquarters in Canada over more than 20 years to provide a flexible and creative system of communication for non-speaking children and adults. It is particularly suitable for people with cerebral palsy who may continue to find reading and spelling difficult but who nonetheless require a system of communication that will expand beyond the more concrete levels of most pictorial symbol systems and allow access to a linguistically flexible means of communication. There are several ways in which the vocabulary available on a user's display can be extended despite severe physical limitations. There is also a careful logic throughout the system which means that as the vocabulary requirements of a particular user increase so they can build on their existing knowledge of more concrete symbols and learn the more abstract ones with less cognitive effort than would be needed to learn more arbitrary representations. This is because Bliss combines elements already learned to create new meanings. The symbol for *bank*, for example, is a combination of the symbols for *building* and *money*, while the symbol for *day* consists of the symbol for *sun* over the symbol for *earth*. Bliss also has the facility for creating grammatical sentences using tense markers and indicators for plural, adjective, possessive, etc., if required. There are around 2,500 symbols in the Blissymbol Reference Guide plus strategies for the user to alter and expand meanings, providing an extremely open-ended system.

These then are some of the most popular systems currently being used with various population groups in Britain, several (Rebus, Makaton and PCS) competing at the more pictorial end of the symbolic representational scale and one (Bliss) that bridges the still wide gap between pictorial symbol communication and conventional literacy

There are increasing numbers of non-speaking people now being introduced to speech output communication aids. Some such aids, which are produced by Liberator Ltd. in the UK, e.g. *TouchTalker*, *DeltaTalker* and *Liberator* come with a system known as Minspeak:-

Minspeak Symbols (or 'Minsymbols') are used in a rather different way to the systems already described. They were developed specifically to give access to a large range of pre-stored synthetically spoken words and phrases but using a finite number of keys (128 maximum). Each key or location on the overlay has a symbol or 'icon' assigned to it. Users learn to make connections between two or more icons in order to create new meanings using a range of attributes and associated features of each icon. An example might be the icon *apple*, which might stand for *food*, *red*, *round*, or even *temptation*. To produce the sentence *I'm not hungry*, the user might learn to press the icon *apple* followed by the icon of a ribbon tied in a *knot*. This can create an interesting way for older users, with already well-developed inner language and life experience, to set up mnemonic associations that will help them recall the icon sequences. In using the system as it stands, however, it is important to be aware of the distorted understanding of basic concepts that this could possibly have for some people with learning difficulties or language disorder. A second and possibly more important point is that, as multimeaning symbols endowed with a range of personally learnt associations, they cannot be used to convey meaning on a 'silent' communication chart, as the communication partner would have no way of knowing which of the range of meanings was intended in a given sequence. (For interesting discussion and comments by Margareta Jennische see McNaughton, 1992).

Some Comparisons between Systems

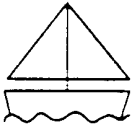
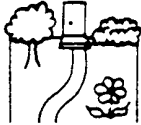
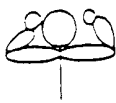
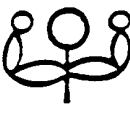
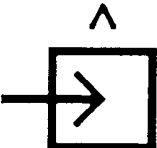
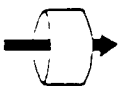
Samples of vocabulary from four of the more commonly used systems in Britain are given in Figures 1 and 2. The symbols were chosen to give examples of some of the following points:

- 1 Many Rebus and Makaton symbols are similar because the early Makaton symbols were based on Rebus. Makaton uses stronger, bolder lines.
- 2 Some pictorial symbols are overcrowded and visually 'busy', e.g. PCS symbols for *garden* and *to enter*. On the whole Rebus and Makaton symbols are clearer and simpler than PCS, although the

use of black silhouettes in PCS, e.g. *boat* makes a few of the symbols very clear and the addition of colour to the PCS library on Boardmaker has enhanced their clarity. Blissymbols are very stylised and therefore less pictorial but clear and easy to reproduce. Visual clarity will be an important consideration for people with a visual impairment.

- 3 Abstract vocabulary is always difficult to depict. Some systems resort to traditional orthography at times, e.g. *for* in PCS, which seems to contradict the main reason for using symbol systems, i.e. for use by those who are not able to cope easily with reading.
4. Where the main attribute of a concept is easily illustrated symbols are often similar across all four systems, e.g. *strong*, *through*.
5. With pictorial symbols it is not always possible to encapsulate the full range of meaning, so one typical situation may be illustrated, e.g., *to need* in PCS; *for* in Rebus; *to wash* in PCS, Rebus and Makaton. This means that the symbol is less conceptually complete or valid and consequently

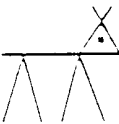
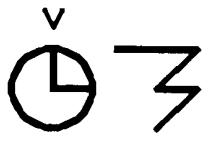
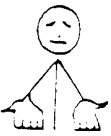
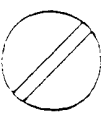
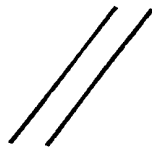
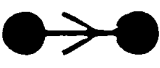
Fig. 1 Comparison of Symbol Systems – Words / concepts which are fairly easy to depict

Word	PCS	Rebus	Makaton	Bliss
<i>boat</i>				
<i>garden/yard</i>				
<i>bank</i>				
<i>strong</i>				
<i>to wash</i>				
<i>to enter</i>				
<i>through</i>				

less versatile. Some systems provide different pictorial symbols for different situations, e.g., *to wash hands* and *to wash face*. For some symbol communicators with severe learning difficulties these very pictorial examples will be necessary but they will, of course, take up more space on a chart

6. The only system which is able to offer really open access to vocabulary, including some very abstract concepts, is Bliss. In order to interpret some of the symbols, however, the user needs to understand the underlying symbol elements, e.g., *suddenly* is made up of *time* + *lightning* (*sky* + *electricity*). Bliss is therefore most suitable for more able children and adults who may in time require a wide and flexible vocabulary. For less able individuals ease of learning and recognition will be more important.
7. Bliss has markers for word classes (verb, adjective, etc.), e.g., *to enter*, *strong*, which allows more versatility and makes the system more truly linguistic. This may be important for more able communicators, but is less likely to be relevant to those with severe learning difficulties.
8. Some symbol dictionaries offer two different sizes of symbols, others suggest they are enlarged or shrunk from the Master Set to suit each user. The symbols in Figures 1 and 2 have been adjusted to matching sizes.

Fig. 2 Comparison of Symbol Systems – Some More Abstract Concepts

Word	PCS	Rebus	Makaton	Bliss
<i>animal</i>				
<i>danger</i>				
<i>suddenly</i>				
<i>to need</i>				
<i>not</i>				
<i>for</i>				

Multimodal Communication

All of us use a range of modalities with which to convey meaning and, while for most of us our primary linguistic mode of communication is through speech, we would be poor communicators without the supporting role of facial expression, gesture, body movement and, particularly where the communication partner is not present, the alternative linguistic modality of the written word. Symbol users also should be encouraged to use a range of communication modalities, for example, a symbol chart backed up by gesture, or a combination of symbols and words or letters if appropriate. Most speaking people have the freedom to communicate at all times whatever the circumstances, and they experience tremendous frustration when that possibility is temporarily removed, due to excessive noise or a bout of laryngitis, for example. Efforts should be made to ensure that non-speakers also have a primary means of communication in all situations. Those children and adults who use a high-tech. communication aid must, therefore, have some back-up for when the machinery breaks down or the batteries need charging and for specific environments where it is not feasible for them to use their machine. It is strongly recommended, therefore, that all symbol users continue to have a chart or communication book in addition to any technology they may acquire.

Thought needs to be given as to how best these low- and high-tech. aids can complement each other. Clearly it is to the user's advantage if the same symbol system can be used on both chart and machine. This is usually fairly straightforward. Rebus, Makaton and PCS can all easily be used on most of the communication aids aimed at beginners or those requiring a limited number of messages only, particularly where a single hit will produce a message. Bliss lends itself well to more extended use where symbols can be combined to produce a large set of multi-hit messages (MacDonald 1989 and 1990). This might include some of the special Bliss strategies such as *opposite meaning*, *combine*, *command / request*, *similar to*, *negative*, or action and tense markers. Using Minspeak symbols, however, as the selection set on a voice output communication aid means that a user cannot have the same symbol system on both their machine and their communication chart. For this reason, even on Minspeak-based machines, many therapists and teachers are opting to use whatever symbol system the user is employing on his or her chart to also represent the messages stored in his or her machine.

Concluding Points

1. Graphic symbol systems offer a particularly suitable medium of communication for non-speaking children and adults with additional physical disability.
2. Indication may be by pointing with a finger, eye-gaze, a head-pointer, or switches on a communication aid.
3. Symbol systems are much more powerful than pictures but they may initially require more effort to learn.
4. Symbol communication can be slow due to physical limitations but it is much faster than spelling out every word.
5. An appropriate word or phrase usually accompanies each symbol on a display, so that they can be understood relatively easily by strangers.
6. Symbols can be used effectively on many communication aids.
7. It is now possible to buy computer software with which to print out symbols from most graphic symbol systems.
8. To allow every user to reach his or her full potential the system must be carefully and appropriately matched to their needs.

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APPENDIX – Symbolic Development

As children develop they are increasingly able to understand that representations of decreasing perceptual similarity to the original object may act as a symbolic reference. This is important when assessing young children, or adults with severe learning difficulties for augmentative communication.

The following hierarchy was based on the work of Cooper, Moodley and Reynell (1978) and Judy DeLoache (1987) (see MacDonald and Rendle (1994) and is confirmed from research by Mirenda and Locke (1989).

1. **Real objects and large dolls** – The child begins to extend his focus beyond himself, to recognise the significance of commonly used objects and to play with these in pretend sequences.
2. **Photographs** – Clear coloured photographs are recognised as exact representations of the real item.
3. **Miniatures / small doll materials** – These will differ significantly in size and possibly in other visual features from the real item.
4. **Coloured pictures** – Two-dimensional, but still fairly realistic.
5. **Line drawings (realistic / sketches)** – Visually less realistic, but still very picture-like.
6. **Line drawings (minimal and stylised)** – Simplified outlines as, for example, in pictorial Blissymbols. Perceptual and conceptual development should allow children from this stage to become increasingly able to understand logically related symbol referents.
7. **Written words** – Completely abstract symbols which relate to sounds rather than meaning.

Symbol Systems – Addresses

- Blissymbol Communication UK*, ACE Centre, Waynefflete Road, Headington, Oxford OX3 8DD. Tel. 01865 764958
- Don Johnson Special Needs*, 18 Clarendon Court, Calver Road, Winwick Quay, Warrington WA2 8OP. Tel. 01925 241642
- LDA (Learning Development Aids)*, Duke Street, Wisbech, Cambs. PE13 2AE. Tel. (0945) 63441
- Liberator Ltd.*, Whitegates, Lincs. NG33 4PA. Tel. 0800 622457.
- Makaton Vocabulary Development Project*, 31 Firwood Drive, Camberley GU15 3QD.
- Widgit Software*, 102 Radford Road, Leamington Spa, Warwicks CV1 1LF. Tel. 01926 885303
- Winslow*, Telford Road, Bicester, Oxon. OX6 0TS. Tel. 01869 244 644.

Use of Symbol Software

Pamela Cornwallis & Andrea Peacock

Over the past 25 years a number of symbol systems have been developed to substitute for speech, or to provide additional support for people who have poorly intelligible speech. The use of these systems spread within the non-speaking, non-reading, physically disabled population and has been developed to encompass the needs of many people with severe learning difficulties. The emergence and use of symbol systems is described in more detail in *Symbol Systems* by Alison MacDonald in Chapter 3 of this book.

This paper provides practical information on the use of symbols, specifically using the available symbol software to produce material with a computer.

	Rebus	PCS	Blissymbols
Software	<i>GridMaker + Writing with Symbols</i>	<i>Boardmaker</i>	<i>Blissymbols for Windows</i> (export version)
Available for	PC, Acorn Archimedes	PC, Apple Macintosh	PC
System Requirements	PC – 4 megs RAM, 6 megs on hard drive for symbols, Windows 3.1 or above Acorn – Risc OS 3.1	PC – Windows 3.1, or above, 6 megs on hard disk for b/w symbols, 8 megs for colour Mac – System 7, or above, hard disk with 6 megs for b/w symbols, 16 megs for colour	PC – Windows 3.1, or above
Description	<i>Writing with Symbols</i> allows words to be typed in from the keyboard. Each time a space is entered, the program tries to match the completed word to a Rebus symbol. (Latest PC version can also be used with PCS, Makaton and Compic symbols) <i>Gridmaker</i> allows you to use the same symbols to prepare overlays for concept keyboards and communication aids, as well as communication charts and books. <i>The Symbol Collection</i> has 1,600 symbols, with the option to purchase extra symbols taking the total to over 2,500.	A graphics database containing over 3,000 Picture Communication Symbols. The program allows you to make professional looking communication boards or overlays in minutes, using either b/w or colour symbols. Any size of spacing of symbol cells can be used. Ten languages are available. It includes a range of pre-made grids for communication aid overlays and it is easy to make your own grids.	This is a Blissymbol library program, which provides the symbols in Bitmap and Metafile graphic formats, allowing them to be used with any other Windows program. In conjunction with <i>GridMaker</i> , it can be used to produce communication boards and overlays.
Cost	<i>Gridmaker</i> – £30 + VAT <i>Writing with Symbols</i> – £85 + VAT	£239 + VAT	Blissymbols for Windows – £60 + VAT
Suppliers	Widgit Software 102 Radford Road Leamington Spa CU31 1LF Tel: 01926 885303 Fax: 01926 885293	Don Johnston Special Needs 18 Clarendon Court Calver Road Winwick Quay Warrington WA2 8QP Tel: 01925 241642 Fax: 01925 241745	Handicom Orangelaan 29 Harderwijk Netherlands Fax: +31341 430602

This is a revised version of a paper which first appeared in Communication without Speech (1996)

Several symbol sets were described in Alison MacDonald's paper. Software programs are readily available for producing Rebus symbols, Picture Communication Symbols (PCS) and Blissymbols.

Computer software for symbols makes a great difference in the quality and quantity of displays that can be provided, in comparison with the traditional draw or photocopy / cut and stick method. There are advantages of:

- **Time:** Although there is an initial requirement of time to learn how to use the program (approx. two hours, minimum), the experienced user can produce communication boards / overlays in just a few minutes.
- **Quality:** The finished product often looks more professional than the manual cut and stick version. For many clients the coloured symbols are more recognisable and more motivating to use. Other clients prefer black and white symbols. It is easy to tailor the communication board to the precise needs of the user.
- **Quantity:** Increases productivity and spontaneity. The symbols are readily accessible, therefore it is easy to be creative. More boards are likely to be created and more vocabulary made available to the user.
- **Flexibility:** As the grids can be saved as computer files, they can easily be updated i.e. symbols discarded or added.
- **Cost:** Although the initial outlay is greater than the cut and stick version of the symbols sets, the programs eventually save money because they save *time*.
- **Effectiveness:** If used creatively, symbol software can provide a gain of communication effectiveness to the client.

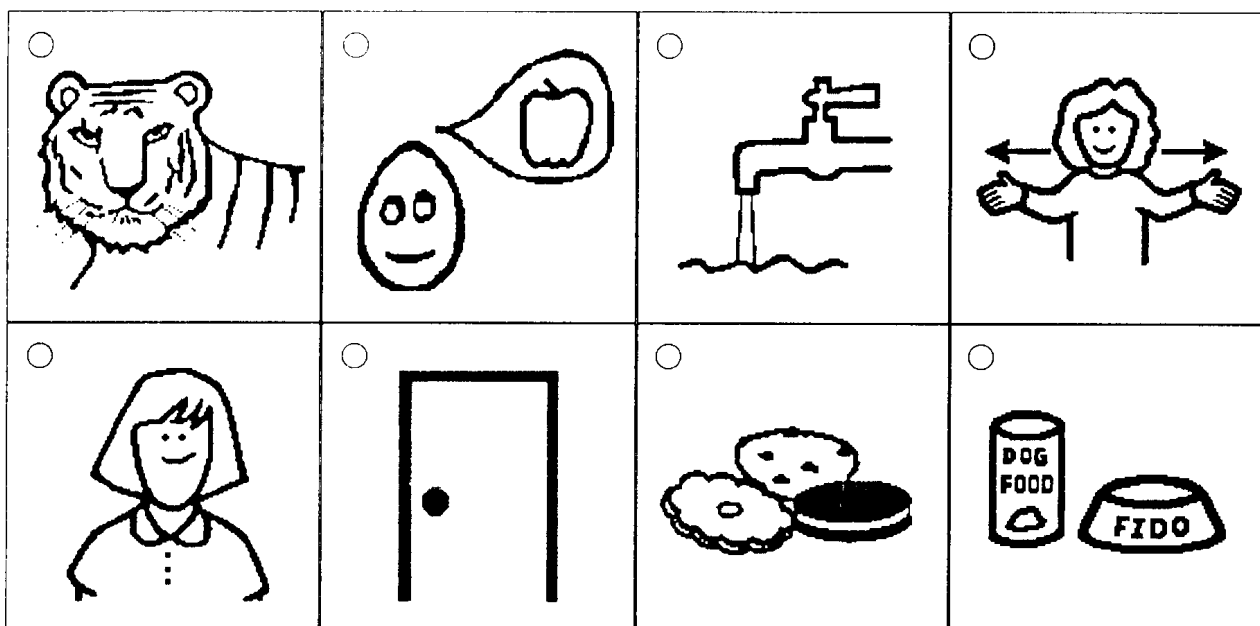
Using Symbol Software

No matter which symbol set the software represents, what is important is what you *do* with it. Here are some examples of the uses we have put the programs to:-

1. Communication Aid Overlays

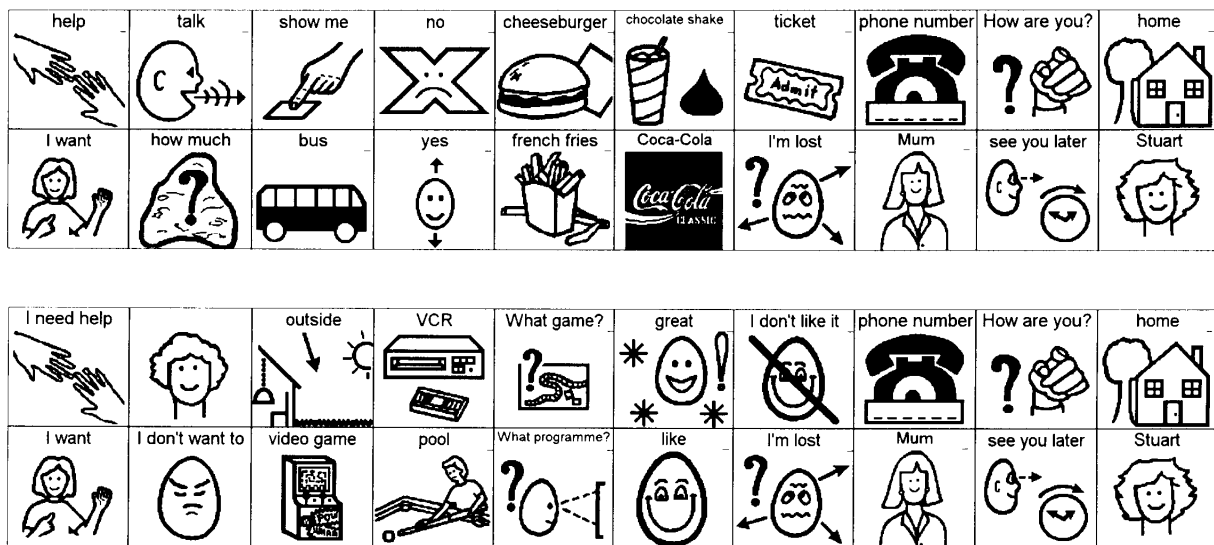
Both *GridMaker* and *Boardmaker* contain pre-made overlay templates for some of the communication aids currently in use (e.g. 8, 32, or 128 location grids, correctly sized). Using either program, overlays can be made up to suit any aid.

8 location AlphaTalker overlay for the children's storybook, 'The Tiger Who Came to Tea'



Made with Boardmaker & the Picture Communication Symbols - Mayer-Johnson Company
P.O. Box 1579, Solana Beach, CA 92075 U.S.A
Phone: (619) 550-0084.

MessageMate overlays for a visit to MacDonald's, and for youth club



Clients who are just beginning to use a high-tech system may need lots of activity overlays to maintain motivation and provide the experience of the power of communication.

Some communication devices, such as the MessageMate, can be used as a portable high tech system, and may need several overlay changes per day/week, according to the situation.

2. Making Low-tech Communication Boards / Books

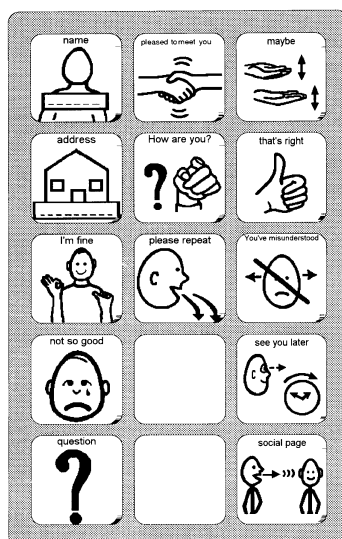
Boardmaker and GridMaker may be used to produce communication layouts of any size for non-electronic displays, or boards, or books. Grids may be saved, hence necessary changes are easy to do, i.e. updating symbols and discarding unwanted symbols.

The option of 10 languages in the Boardmaker program is useful for bilingual clients, or for foreign language tuition, although Gaelic and Asian languages are omitted, unfortunately.

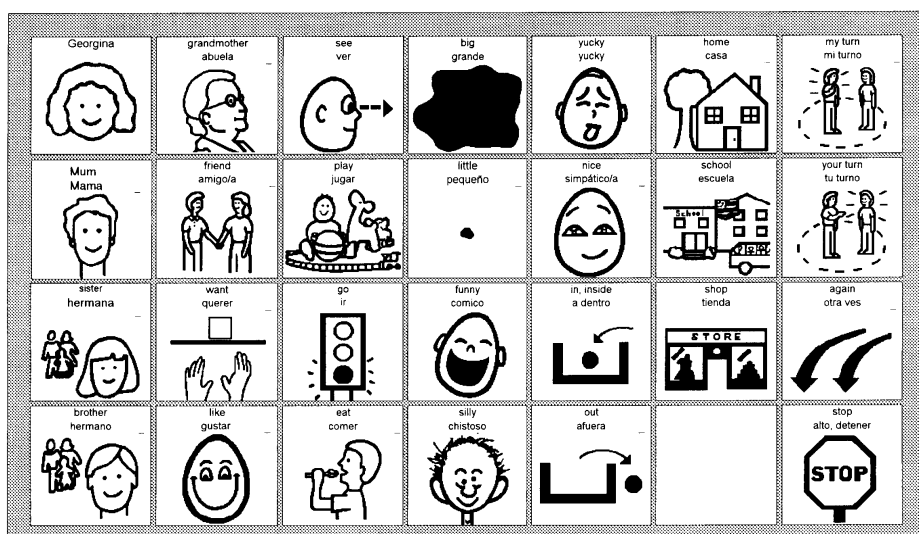
3. Access to Information

Symbols may be imported into other documents, giving clients with literacy difficulties access to information.

Topic Page from a
Communication Book



Core vocabulary page for 10 year old bi-lingual girl



Symbol Timetables

Some children may be able to read the words and so do not require symbols. Some children may use symbols to help their understanding of the written word and others may rely completely on the symbols.

Monday	Assembly	Computer	Lunch	Gym	Listening
Tuesday	Number	Music	Lunch	Outing	
Wednesday	Computer	Language	Lunch	Art	
Thursday	Swimming	Computer	Lunch	Number	Singing
Friday	Library	Language	Lunch	Cooking	Reading

Monday					
Tuesday					
Wednesday					
Thursday					
Friday					

Monday					
Tuesday					
Wednesday					
Thursday					
Friday					

Symbolised Information Sheet

AUGMENTATIVE AND ALTERNATIVE COMMUNICATION (AAC)

Augmentative and Alternative Communication, or AAC for short, is the term used to describe any method of communication which is used to replace or supplement impaired speech or handwriting (the more "usual" methods of communication).

AAC systems can be **unaided** (e.g. sign language) or **aided**.

Aided AAC systems can be:

- **low-tech** for example, symbol charts, communication folders, etc.
- **high-tech** for example, computers with speech output, etc.

High-Tech AAC Systems:

These tend either to be "purpose built" aids or standard computers with specialised peripherals such as speech synthesizers and switch interfaces.



text

speech

High-Tech AAC systems (whether purpose built or not) tend to offer the user a variety of outputs:
 on screen or LCD, on internal printer ("scratch pad" type printout), on standard printer offering good quality copy.
 there are two main methods of producing speech electronically - **digitised speech** (where human voice is recorded and saved on a memory "chip"), and **text-to-speech synthesis** (where the computer/processor converts text into electronically produced phonemes, or speech sounds).

High Tech AAC systems have two main methods of access which can be used by an individual to control the device and select what he/she wants to say:



direct selection - where the user is able to select by physically touching the equipment, via a keyboard, touch screen, membrane keypad, etc. Some individuals may use pointers e.g. head pointer, infra-red head control units, mouth sticks to assist them in their direct selection technique.



indirect selection - where the user makes a selection by activating a switch, or switches, attached to the communication aid. The communication aid must be able to accept a switch (possibly via an interface box) and must have a scanning array or display available to the user.

As technology has improved, more and more people with severe communication difficulties have access to speech via an AAC system. It is important to remember, however that people communicate with each other and not with machines! No matter how sophisticated the communication aid is, it cannot speak on its own! Your communication style when you talk with a person using an AAC system, your attitude towards that person, the opportunities that person has for real conversations, the amount of training and support the AAC user gets, the amount of training that you (as a communication partner) get - these things are vitally important in determining how effective the use of the technology will be!

For further information about AAC, please contact a Speech and Language Therapist at your local Hospital or Health Centre.

In addition to being used to prepare overlays for VOCAs (voice output communication aids) and symbol charts, symbol software can be used in other ways to promote independence. Some simple ideas are described here as a starting point.

Children can be given equal access to timetables and class routines if they are provided in symbol format. This helps children with literacy problems to make their way around school without having to rely on others to decipher their written timetable for them. For children who remain with one class group throughout the day, a time table helps them to know where they are in the day, what has been done and what they will be doing next. This idea has also been adapted and used successfully in centres for adults with learning disabilities.

Producing symbol timetables on computer is quick and easy. The timetable can be saved so that if alterations are needed, they can be made without starting again from scratch. This allows variations of the same timetable to be produced to meet the needs of different children in a class. Some children may be able to read the words and so do not require symbols. Some children may use symbols to help their understanding of the written word and others may rely completely on the symbols.

They will all be able to use the information in whichever format is most suitable for them.

Recipe Sheet

bread and butter

you need

bread butter plate knife

first

get two slices of bread

next

put the bread on the plate

next

get the butter and the knife

last

spread the butter on the bread

stop well done

Using symbol software for recipes or worksheets and diaries can promote independence.

Symbol recipes / worksheets give the symbol user access to longer, more complicated information or instructions. The 'recipe' below helps a child to complete a simple task without prompting from adults or other children.

Worksheets can also be prepared to let children who use symbols take part in the same classwork as others without having to rely on the written word.

Sample Worksheets

draw a big fish

Which pictures go together? Draw a line.

sock		legs
gloves		head
trousers		foot
hat		hands

Children who use symbols can be helped to keep a diary as a record of their activities. This can be taken home to facilitate a conversation about what happened at school. A skeleton diary can be prepared quickly and easily and can be updated as often as necessary. The child can then add in symbols to represent the activities they took part in. Diaries can be made simple or complex to meet the needs of the symbol user.

Clicker Plus



Other Software

In addition to the software described for producing symbols, other software exists which can integrate and utilise these symbols.

Writing With Symbols can be used with the *Clicker* programmes from Crick Software. *Clicker Two* is like an on-screen concept keyboard with speech. Rebus symbols can be dropped into a Clicker grid where they can act as a valuable support for clients with literacy difficulties. *Writing With Symbols*, being a symbol processor, allows the symbols to appear in the client's work. The *Clicker* programs are available from: Crick Computing, 1 The Avenue, Spinney Hill, Northampton NN3 6BA. Tel. 01604 671691.

Symbols To Sentences can also be used with *Writing with Symbols* to assist the development of spelling, reading and writing with symbols to support the written word. The teacher can prepare exercises and save them for individual children to use. Some activities which are suggested include: spelling from an anagram; spelling by copying; initial letter matching and completing simple sentences. The symbols act as a prompt for the word the child has to spell.

Symbols to Sentences



In conclusion, for many non-speaking people, graphic symbols are a vital medium for the development of appropriate communication systems. They can be used to prepare materials for many purposes including overlays for VOCAs, communication books and boards, wall charts and timetables.

In addition to allowing interactive communication, symbols are powerful learning tools playing an important role in the support and development of language and literacy

skills. The lives of busy speech and language therapists, teachers and others are being made easier by the availability of computer software packages to help produce these symbol resources.

In this paper we have described the programs and given some ideas as an introduction to their many possible applications.

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Kerr, J. (1968) *The Tiger who came to Tea*. William Collins Sons and Co. Ltd.

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Matching Technology to Individual Needs

Jane Donnelly & Annie Kirkaldy

Severe communication impairment can affect all ages, children, adolescents and adults whose difficulties may be classified as:

- congenital – present from birth
- acquired – arisen in later years
- degenerative – progressive in nature

The communication difficulty may have resulted from any of the following conditions:

- physical impairment including Cerebral Palsy
- learning difficulties
- head injury
- stroke
- tumour
- progressive illness including
 - i) Motor Neurone Disease
 - ii) Multiple Sclerosis
 - iii) Parkinson's Disease

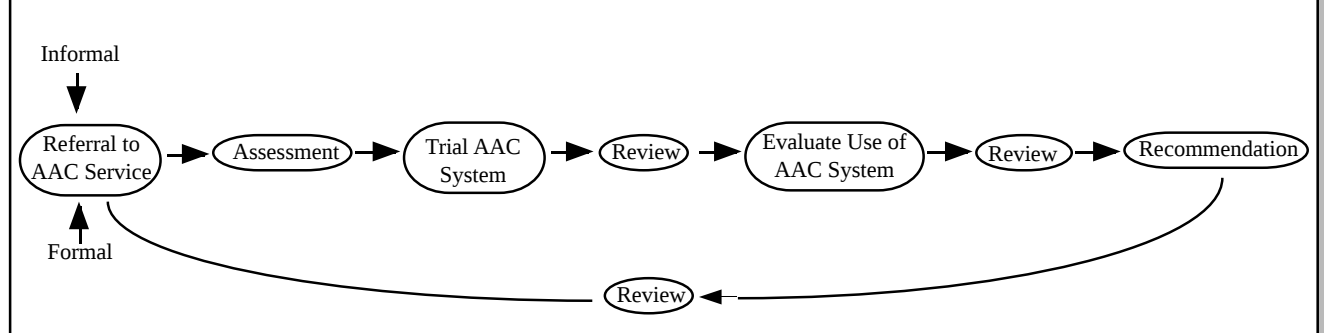
For those individuals with a communication difficulty so severe that their access to learning and quality of life is seriously impaired, the provision of alternative and augmentative communication (AAC) can be of enormous benefit.

As the field of AAC continues to develop rapidly, and the amount / variety of technology increases, the professional working with the communicatively-impaired client can be faced with the difficult dilemma of selecting the most appropriate AAC system to complement their client's individual needs.

Many factors (e.g. financial constraint, experience of the professional involved, awareness / availability of new technological developments) can have an influence on the type of system selected. This paper hopes to address some of the client-centred issues which should be considered before an AAC system is recommended. The assessment process within the suggested model of care outlined below will be the main area of focus.

For those individuals with a communication difficulty so severe that their access to learning and quality of life is seriously impaired, the provision of alternative and augmentative communication (AAC) can be of enormous benefit.

Model of Care - client using AAC



The Assessment

The assessment process is a vital component in enabling the professional to provide suitable technology for the client.

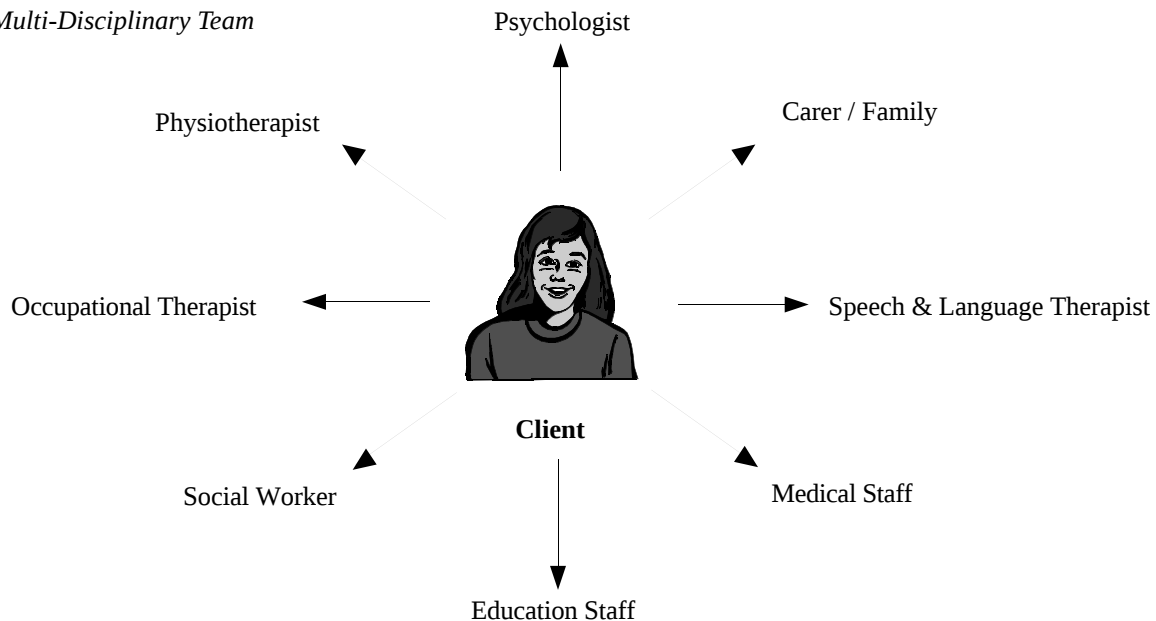
Assessment of the person's communication abilities is carried out over a period of weeks or months. The duration of the assessment period is dependent upon several factors, including the complexity of the person's physical impairment, communication difficulties and capacity for learning.

Multi-disciplinary assessment is essential in collecting all relevant information pertaining to the client from involved professionals.

This paper first appeared in Communication without Speech (1996)

The Multi-Disciplinary Team

Although many individuals can be involved at this stage, it is important that one person coordinates the collation of information. This is often, but not always, the Speech and Language Therapist, who is in most cases involved from referral through to eventual discharge.

The Multi-Disciplinary Team

Information which is gathered early in the assessment process includes:

- ability to understand language and non-verbal communication
- expressive ability including non-verbal communication
- communication environment including the level of support available from carers and professionals
- motivation to communicate
- ability to learn
- seating and positioning
- gross and fine motor control
- hearing and vision
- emotional state and behaviour

The assessment may be carried out by observing the client's communication in a variety of situations and with different people, and a more formal approach may also be adopted with standardised tests and/or check-lists.

Areas which may be directly assessed include:

- auditory and visual perceptual skills
- memory and recall
- choice-making
- initiation of communication
- turn-taking
- physical ability to access a communication device
- visual tracking
- positioning of equipment
- symbolic understanding / cognitive ability – (sequencing / classifying abilities)
- literacy skills
- use of any existing low-tech systems

Trials and Adaptations

Once the initial part of the assessment has been conducted and information collated, devices or systems which may prove to be beneficial are identified and trialled by the client. Interim modifications to the hardware may have to be made at this stage and software may have to be created or adapted to make the use of the equipment feasible.

In the preliminary choice of system the following factors will have to be considered:

- communication medium – text, pictures or symbols
- selection of vocabulary / size of overlay
- type of equipment whether portable or workstation
- input system – direct selection or switch control
- output system – visual display, voice synthesiser or printer
- appropriate software package
- assessment of appropriate mounting kits, if necessary

What Type of Communication Device / System may be Selected?

Following assessment the professional may select either ***Low tech, e.g.***

- a gestural communication system, e.g. *Makaton*
- a communication board, folder or frame containing pictures, symbols, photographs and / or written words phrases
- an alphabet chart
- switches which allow a degree of environmental control / independence
- simple recorded voice-output devices containing a limited number of messages, e.g. *BIGmack*, *Spokesman*, *SpeakEasy*.

or ***High tech e.g.***

- electronic communication devices:
 - input being either a “qwerty” or alphabetically arranged keyboard and/or display of pictures, photographs, symbols and/or written words; e.g. *DeltaTalker*, *Lightwriter SL35*, *ORAC*, *AlphaTalker*, laptops with word processing packages.
 - Output may be printed, visual and/or speech. The speech may be a digitally recorded human voice or a synthesised voice depending on individual device.

In some cases it may be necessary to introduce a low-tech device or system which will allow a client to progress onto one that is more sophisticated. Low-tech systems should also be provided whenever possible, to allow users to have a back-up method of communication in case of electronic equipment failure.

Introduction of the AAC System

“*Throwing technology at a problem is not synonymous with its solution*” (T. Jones, 1994)

Once an AAC system has been selected for the client, adequate support and training is vital in ensuring the correct development / functional use of the equipment in the long-term. Goals should be set and strategies to be used discussed and agreed with carers and professionals involved with the client.

Before the selected communication device or system can be introduced, preparatory work may be necessary to overcome difficulties which may exist and to help develop necessary skills in certain areas, e.g. concentration; understanding of cause and effect relationships; hand-eye coordination; speed of reaction; making eye-contact; visual scanning.

Training in the use of the device or system is essential for long-term success. This may take the form of direct intervention with the client, demonstration for the client, carers and professionals and/or workshops. Training in use of switches to access devices or systems may be needed if clients have significant physical impairments. Switches may be positioned for use by different parts of the body e.g. hand, foot or head.

A computer system with suitable software may be chosen either to develop the above skills or as the adopted communication system.

As the client becomes skilled in the use of the device or system, and relevant carers / professionals involved gain understanding to support the user, the involvement of the multi-disciplinary team can gradually be decreased.

Review

Once direct intervention has been completed clients should be seen on a review basis. A review of the client and their circumstances should be carried out at appropriate intervals to make sure that any changing needs over time are identified and met. Carers and professionals involved may change; the client's environment may change; the client may change (through maturation or the effects of progressive illness). Effectively matching technology to meet the individual needs of a client can be a long-term and ongoing process. Comprehensive multi-disciplinary assessment coupled with a knowledge of the current technology available is therefore very important in ensuring that an appropriate recommendation of an AAC system can be made.

Case Study 1

M is a 5 year old boy with cerebral palsy. He currently attends nursery but is soon to enter Primary 1 in a mainstream school. M's speech is dysarthric and more or less unintelligible to all but familiar listeners / family. M is a bright, sociable child who is very motivated to communicate with those around him. Throughout assessment, he displayed well-developed comprehension skills / cognitive ability and an aptitude to learn.

Initially a 32-overlay, picture-based *ORAC* was selected for M to trial. He was extremely motivated by the voice output and quickly mastered the vocabulary selected. It became apparent that M had many ideas he wanted to communicate and that selection of an appropriate vocabulary for him by his Speech & Language Therapist was difficult and often too limiting. He required greater communicative flexibility. Following further assessment of his sequencing / classification / picture association skills he was given a 128 -overlay + *Language, Learning and Living*, a Minspeak application from Liberator Ltd.. This has proved very successful and M is currently developing / expanding his knowledge of the system. Intensive input with both M and staff has been and continues to be essential in ensuring his continued success.

Case Study 2

G is a 70 year old lady who suffered a R-sided CVA approximately 18 months ago. She presents with non-fluent dysphasia. G has received weekly therapy which has focused on developing her language-skills, single word intelligibility and gesture to supplement her expressive output. However she had become increasingly frustrated by her inability to express a familiar word / phrase to family / friends. During assessment she was unable to accurately use a *Lightwriter* due to spelling difficulties resulting from the stroke. A *MessageMate* was programmed with 15 phrases / sentences selected by J her husband which were felt to be useful conversation starters / acknowledgements. G was also supplied with a conversation wallet containing symbols organised by category representing items relevant to her to overcome word recall difficulties and to augment her gestural skills. Combining these two low tech and high tech systems has proven to be most effective for G.

Case Study 3

A is a 37 year old man with cerebral palsy. He uses a wheelchair.

During assessment, it became apparent that A had excellent comprehension, cognitive ability and potential to learn. His current expressive low-tech system was limiting for him consisting only of 20 symbols. Due to a lack of formal education his literacy skills were poor and it was felt that a symbol based system would best meet his needs at this time. The *Liberator* (128-overlay + *LLL*) was given to him to trial. He showed a good aptitude to understand and recall the logic of the vocabulary. Accessing of the device is currently undergoing assessment. Direct manual accessing is impossible due to level of physical impairment so a switch and scan system is used. A, however, is keen to develop his skills to use the infra-red head-pointer to allow more rapid selection of vocabulary than scanning can allow.

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High Technology Aids to Communication

Deborah Jans and Sue Clark

Within our modern society, the general public is utilising high technology equipment more and more within daily life. For people with disabilities also there are many applications for the use of high technology equipment in communication, learning, employment, and leisure / recreation activities.

This chapter focuses on high technology equipment designed for people with communication impairments. In discussing electronic communication aids, we will consider the common features of the communication aids currently on the market and being implemented in this country. Additionally, we will review different input methods and issues surrounding implementation of a device for an individual user.

Most of the equipment discussed here was originally designed for individuals with a physical impairment, but there are many different client groups which can benefit from communication aids, as listed in Chapter 1. Assessment procedures, for the selection of a suitable AAC system for a particular user have been discussed in Chapter 5, however it is important to emphasise that any potential user of a communication aid will require a detailed assessment. This is best performed by a multi-disciplinary team with the appropriate expertise.

High Technology aids to communication are here defined as equipment which is electronic in nature and requires a power supply – either battery or mains powered. High technology communication equipment can be divided into two main categories:

- dedicated communication aids
- computer based communication equipment.

Dedicated Communication Aids

Dedicated communication aids were designed solely for the means of providing an alternative to oral speech or to augment an individual's oral speech. Although some aids do provide access to additional activities such as writing and environmental control, their main purpose is to provide a means to communicate in conversation. Appendix 1 provides a summary of the most widely used dedicated communication aids available in the United Kingdom.

As shown in Appendix 1, there are many communication aids available on the market today. To better discuss and evaluate each communication aid, four factors in particular need to be considered: access; the selection set; the output mode and portability.

Accessing the Communication Aid

There are two main avenues that an individual can use to access a communication aid: *direct selection* or *indirect selection via scanning*. The physical positioning of the individual user and his/her physical abilities will form the basis for deciding which access method is to be preferred.

Direct selection

Direct selection is defined as the ability of the user to select by physically touching the equipment. This may be a keyboard, touch window, or a membrane keypad. This definition can also be extended to include the use of a head pointer (either a head or chin stick, head mounted optical pointer or infrared head control unit) or a mouth stick. Direct selection can be done with any part of the body e.g. foot, hand, nose etc. The most common is accessing directly with the hand, either by fist pointing or finger pointing or in combination.

Communication aids can have varying types of keyboards with variable sensitivity and feedback to the user, usually in the form of a click or a beep. In addition, as indicated in Appendix 1, some aids allow the user and facilitator to choose different sizes for the individual keys on the keyboard. This allows for more flexibility for an individual user, or across a range of users.

Indirect selection

The second type of access method is indirect selection via scanning. This requires the user to activate a switch or number of switches connected to the communication aid. The communication aid must be able to accept a switch and have some type of scanning array available to the user.

When discussing indirect selection, it is important to have an idea of the different types of switches available to an individual user. Switches come in an almost infinite variety and can be customised to suit each individual. For example, they can be activated by movement or pressure with different parts of the body, by heat, breaking a light beam, or sound, or by pneumatic control (suck/puff). Switches may come in single, double, four-way or multiple configurations. Commonly used switches include:

- Simple lever switches, operated by pressing on the hinged 'lid' of a lightweight box.
- Platform switches, requiring the user to press a large 'lid' or button resting on a few switches; light pressure on any part of the 'lid' activates one or other of the switches.
- Bead switches mounted on a necklace and activated by the chin or cheek.
- Head switches, mounted into a wheelchair / headrest.
- Push switches and joysticks – operated by pushing a handle or plate.
- Wobble switches and spring sticks -the user can hit the switch in any direction.
- Suck and puff switches (which require a user with good breath control).
- Tongue switches.
- Sound operated switches (difficult to set correct sensitivity in noisy environments).

Switch access is discussed in greater detail in the next chapter.

Some communication aids are designed specifically *either* for direct selection *or* indirect selection via scanning. Over recent years, manufacturers have often combined these two different types of access methods into one single aid. This can be seen in communication aids such as the *ORAC*, *MessageMate*, *Liberator*, *AlphaTalker*, *DeltaTalker* and *Macaw*, to name a few. This allows for more flexibility for an individual user as it allows the user to choose different access methods during the time they are using the communication aid. This may be important as the user either develops more consistent physical abilities over time, or, in the case of users with progressive conditions, as their physical capabilities become more limited over time.

Selection Set

Dedicated communication aids may be used with different types of representational system. The system chosen for use may be known as the *selection set*. The most commonly used selection sets are either symbol / icon based or text-based.

Text-based Systems

Text-based systems usually use a standard form of alphabetic letters and numbers. The display of these letters may be the QWERTY layout as seen on computer keyboards, or an alphabetical layout, or a special display based on the statistical frequency of occurrence of letters in the language. In the case of some special codes, e.g. with Morse Code, the user does not really have a display of letters as such at all; the system provides an access technique whereby the dots and dashes are transmitted as switch presses through an emulator that translates these codes into letters and numbers.

Symbol / Icon-Based Systems

The different symbol / icon systems available have been described in Chapter 3. It is important to note when considering a particular communication aid, whether that aid utilises symbols or icons as an interface, or alphabetic letters and/or numbers. Communication aid designers often combine both types of interfaces into one aid to extend the choice available to the user. This can be seen in the *Canon Communicator*, for example, which can be transformed from a text-based communication aid to a symbol based aid by utilising the Canon Memory Mates provided with the communicator. Dynamic screen devices, such as the *DynaVox 2*, the *Cameleon* and the *Vanguard* can be set up for use with symbols / icons, text, or a mixture of both.

Output

Another major factor to consider when looking at individual communication aids is the output that is available.

Visual Output

Visual output refers both to a visual display unit such as a small screen, and to printed copy of the messages through a printer. Screens and printers may be internally built ('on-board'), or connected externally to the communication aid.

It is important to evaluate the clarity of the visual display (especially in differing light conditions); the size of the display; how many lines / characters the display will show at any one time. If the display is small and only shows a limited number of characters there is usually a buffer built in to save the data as it scrolls off the screen. A cursor can then move to retrieve it later as needed.

Auditory Output

An important form of auditory output is the type of speech output the communication aid supports. There are two different types of speech output: *digitised* and *synthetic*.

Digitised speech is a real voice recorded into a communication aid. The advantages of digitised

speech are that different languages, regional accents, or dialects, and age / gender of voice can be used. Digitised speech may sound more 'natural' and acceptable, for some listeners. Digitised recording also allows the user or his facilitator to use environmental sounds such as a doorbell ringing. The main disadvantage of digitised speech is that the user has to work with a fixed vocabulary at any given time, as he or she cannot create and store new messages by him/herself but is dependent on others for this. Digitised speech also takes up a lot of memory, in a device.

Synthetic speech is speech generated by a computer. There are many different types of synthetic speech available commercially. Some are used in a whole variety of different communication aids (such as *DECtalk / Multivoice*) while others are specific to a particular aid (such as *EuroTalk* in *Lightwriters*, or *Oratalk* in the *ORAC*). One of the advantages of synthetic speech is that it uses less memory than digitised. Also, synthetic speech is open-ended and allows spelling in of an unlimited range of new messages. This can be done by users themselves, if they are able and wish to do so. The disadvantages are that it may be more complicated and time-consuming to program a device with synthetic speech, than one with digitised, and that sometimes the pronunciation is not 100% accurate (although most systems now have a 'pronunciation adjustment' facility).

It is becoming more popular to have a combination of different types of speech outputs available in the same communication aid. (This facility is available on the *ORAC*, *DeltaTalker* and *Vanguard*, for example.) This offers the user more choice, for example in placing emphasis on different messages or types of message, and in taking decisions about the most efficient use of the device.

When evaluating different communication aids, it is important to note the clarity of the speech output, ability to represent different voices, gender, pitch variations etc. Choice of voice is a very personal decision made by individual users as to which voice they feel most comfortable with, and can best understand or be understood.

Feedback

Communication aids may also supply a special type of output, whose function is to support and give information to the user, rather than to the listener. This is known as *feedback*.

Auditory feedback options mainly consist of a choice of click or beep when a key is pressed on the keyboard (or selected some other way). Some communication aids give users an auditory prompt as they scan along each message, before they make their selection; such auditory scanning methods may be particularly useful for people with visual impairments.

Tactile feedback (where users feel the length of a keypress, or a definite click as a key is activated) may also be helpful to tell users when they have been successful in their selection and may move on to the next (Some keyboards, e.g. membrane, lack this).

Visual feedback would include the lights on a scanning system. A useful form of visual feedback is the 'icon-prediction' feature seen in devices such as the *DeltaTalker* and the *Vanguard*. As the user builds up a message, the keys that are 'possible' as the next keypress (i.e. those keys that have messages attached to them), light up to guide the user to them. This places less strain on the user's memory, and speeds up selection for scan-switch users.

Portability

The issue of portability has important practical implications for the user. As technology advances, it is becoming much easier to find equipment in a range of different shapes, sizes and weights. It is important to keep in mind whether a communication aid is indeed truly portable or just transportable. If our goal is to provide equipment to help an individual become independent in their daily life, then we need to make sure that the user can carry or transport the aid to different locations if necessary. This has different implications for people who are ambulant as opposed to people who use a wheelchair.

A number of communication aid manufacturers / suppliers also sell specialised mounting systems, for use with wheelchair users to allow the communication aid to be portable.

Designers have taken up this challenge of portability with respect to ambulant users. Some suppliers now have carry bags available in varying shapes and sizes, including bags you can wear around your waist. It is sometimes a major deterrent to successful use of a communication aid if the user cannot carry the aid around while shopping or perhaps switching classes in school or college. Other communication aids have been designed specifically for the ambulant user, for example, the *Cameleon CV* and the *DynaMyte* have been designed as "small" versions of the *Cameleon* and *DynaVox 2*, respectively.

Appendix 2 provides an overview of the different dedicated communication aids and the features that they support.

Computer based Communication Equipment

Computer based communication aids mainly consist of software programs which can transform a computer into a communication aid. For the most part such systems still maintain use of the equipment as a computer as well. There may be many reasons why a user might opt to use a computer based communication system rather than a dedicated aid.

For example, many households have a computer readily available and people may already be familiar with it. In addition, for those users who may need the full range of capabilities of a computer for certain situations (such as writing with a word processor) *and* a communication system, this can now be provided in one piece of equipment rather than two different systems. This minimises the amount of equipment the user has to deal with. Furthermore, as the computer based systems are mainly software controlled, it is much easier to upgrade or change the system as a user's needs change.

Disadvantages of computer-based communication systems may be that they are often not neatly portable packages; it can be difficult to know which extra 'bits' to buy; their battery life is often poor, again restricting portability; there are few ready programmed vocabulary packages available.

There are now many communication systems available for both the PC based computer and the Apple Macintosh computers. These are listed in Appendix 3.

Use and Integration of Communication Technology

A discussion of different communication aids would not be complete without a look at the issues surrounding the use and integration of the technology into the users' daily environment. Two main areas need to be considered: *support* and *training*.

Support

The level of support required for each individual and their significant partners will vary from individual to individual. However, it is imperative that some type of support is arranged from the very beginning. All too often technology fails, not because the wrong communication aid was supplied, but because there was little or no support given to the individual and his/her facilitators.

Support may be provided in various forms. Some users will require regular support and advice with regard to use of the communication aid and any mechanical or instructional problems that may arise, over a long period of time. In other cases, infrequent phone support may be all that is required.

All too often technology fails, not because the wrong communication aid was supplied, but because there was little or no support ...

Support can also come from within the user's own family. It is important to identify the level of support each individual user has within their own environment. Significant family members can be of great help in supporting the user especially in the initial stages of using the communication aid.

Training

In order to ensure that the user obtains the maximum benefit from the new technology, training must be provided. Training may be required both by the user and by the significant partners or facilitators in the user's environment.

One of the most immediate training needs for the user and his/her facilitator(s) is that which leads to the acquisition of basic operational competence in the use of the communication aid. This should consist of instruction in the operation of the particular communication equipment as well as maintenance and charging of the equipment. It may be important to identify a key person who will be responsible for the maintenance of the equipment. This may be the user him/herself, or may be his/her facilitator.

Facilitators may be parents, spouses, other family members or key workers who are involved in the implementation of the communication aid. Some facilitators will be working with many users and would benefit from a general and broad type of training. Training may need to be kept up over a period of time for some facilitators as aids may be upgraded from time to time as the user's needs change and as advances in technology occur. In some cases, new facilitators may need to be trained at regular intervals due to staff changes in schools and residential homes. Many users may have a large number of carers or facilitators in order to maintain an independent life style. It may be important to provide training to *all* the carers, or it may be appropriate to select a few to be trained to deal with different aspects of the communication aid and its use in the environment.

Integration

The user and his/her facilitator will need training in integrating the communication aid into their daily life. The introduction of any new technology into an individual's environment inevitably requires adjustments to be made. Individuals with progressive conditions who have lost the ability to speak and who must now rely on technology to communicate will require time for psychological adjustment.

For individuals with congenital speech difficulties, using an augmentative communication aid may be a tangible recognition that their speech is not likely to improve very significantly, which again may require emotional adjustments. Family and friends will also need time to get used to the use of the communication aid.

As well as training in the use of the device, facilitators and users will require training in the introduction of the communication aid into their natural environment. It is often beneficial to introduce the communication aid in planned steps so as not to overburden the user and/or their facilitator(s).

Communication aids have their limitations. The use of a communication aid makes for a slow communication process. The vocabulary available with which to express their ideas may be more limited than previously, in the case of an adult user who has lost their ability to speak. Training and counselling in coping with these changes will be necessary if the communication aid is to be successfully utilised.

In conclusion, technology can have a significant impact on the lives of people with communication impairments. However, it is not an exact science. The use of high technology can benefit a great number of people, but provision of a high technology communication system might not always be the answer for everybody. Low-tech systems may also be necessary as a back up system and/or in combination with a high tech communication aid to maximise an individual's communicative competence.

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APPENDIX 1 – Portable Communication Aids commonly used in the U.K.

The prices shown here are a guide only, as prices may vary with different 'models' of aid, or may change over time. All price guides are excluding VAT (which may not be payable, if the aid is purchased by or for use by a disabled person). Although only one supplier is indicated for each device, many suppliers now have a wide range of devices so it is worth getting catalogues from different suppliers and consulting them with regard to support and exact prices before reaching final decisions on purchasing equipment.

Aids are listed in alphabetical order, within each category.

Text Aids (no speech)

MemoWriter – Small, portable communicator with a QWERTY keyboard, a 24 character display and a printer. Up to 24 personal / emergency messages of up to 55 characters can be stored and printed at the touch of only 2 keys. No speech output. **Price Guide: £625.** Available from QED, Ability House, 242 Gosport Road, Fareham, Hants PO16 0SS. Tel: 01329 828444.

Digitised Speech Aids

AlphaTalker – Digitised speech aid with 4, 8, or 32 message locations (up to 30 minutes of speech). Can be used with pictures or symbols, Allows direct selection, multiple switch access (8 locations only), optical head pointer access, and scan-switch access. No screen. Icon prediction. Memory expansion available. **Price Guide: £1,275.** Available from *Liberator Ltd., Whitegates, Swinstead, Lincolnshire NG33 4PA. Tel: 0800 622457.*

Ablenet BIGmack – This is a big, colourful communicator into which a single message of up to 20 seconds can be recorded. Can be connected to an external switch and to a toy or appliance. **Price Guide: £99.** Available from *Inclusive Technology, Saddleworth Business Centre, Delph, Oldham OL3 5DF. Tel: 01457 819790.*

AbleLink One-Step Communicator – This is similar to the BIGmack, but smaller. Messages can be up to 20 seconds long. Can be connected to an external switch and to a toy or appliance. Communicators can be connected together to provide the user with a choice of messages. **Price Guide: £115.** Available from *Inclusive Technology, (as above).*

Canon Communicator – Small, highly portable text-based communication aid using digitised speech (4 minutes of recording time), with a mini QWERTY or ABC keyboard. Offers both direct selection and switch-scan access. Tiny ‘ticker- tape’ printer built-in; small detachable screen available (at extra cost). **Price guide: £800.** Available from: *Easiaids Ltd., 5 Woodcote Park Avenue, Purley, Surrey CR8 3NH. Tel: 0181 763 0203.*

ChatBox – Light portable aid with 16 locations accessed directly, or by switch / scan. Symbol sequencing, with icon prediction, allows access to up to 450 vocabulary items using digitised speech (3 minutes). Can be used with Minspeak MiniMap which allows progression to larger devices. **Price Guide: £465.** Available from *Liberator Ltd., (as above).*

Digivox 2 – Digitised speech aid (between 16 and 142 minutes of recorded speech) with up to 48 message levels divided into 6 user groups. Direct selection and switch-scan access options, including auditory scanning; no screen. Disk drive available (at extra cost). **Price Guide: £2,150 to £3,995** depending on model. Available from: *Sunrise Medical, Dynavox Systems Department, Sunrise Business Park, High Street, Wollaston, West Midlands DY8 4PS. Tel: 0138 444 6789.*

Eclipse – Robust slimline aid offering up to 40 minutes of recorded speech in direct-selection and scanning models. The keyboard can be divided into between 2 and 128 squares, while a “talking menu” provides help in setting up the device for an individual user. **Price Guide: £1600** Available from *MARDIS, Fylde Avenue, Lancaster University, Lancaster LA1 4YR. Tel: 01524 593692.*

FourTalk – A family of very small portable aids capable of storing up to 4 messages with a total recording time of between 16 and 32 seconds. Different models allow direct selection, or access by switch and scan through 1 or 2 switches. **Price Guide: £305 to 375.** Available from *QED, Ability House, 242 Gosport Road, Fareham, Hants PO16 0SS. Tel: 01329 828444.*

MessageMate – Range of small portable digitised speech aids, offering both scan-switch (single or double switches) and direct access (membrane keyboard) in 1 machine. Various models, depending on the number of locations (8 to 40) and the number of seconds of recording time available (the second number on the Model name). No screen. **Price guide: £260 to £715.** Available from: *Cambridge Adaptive Communication, The Mount, Toft, Cambridge CB3 7RL. Tel: 01223 264244.*

Portacom 40 – Small, robust aid providing multiple scanning options for single and double switch users and direct access. Up to 40 locations can be used in 4 levels to provide up to 160 messages with a total recording time of between 4 and 7 minutes. **Price Guide: £1,175 to £1,425.** Available from: *QED, (as above).*

SpeakEasy – Digitised speech aid (total of 2 minutes recording time) to record and play back up to 12 short messages. Direct access (membrane keyboard) or switch access. No scanning – each message location has its own switch socket, so useful for beginning switch users, or up to twelve different users can activate the device, as a group. Can be used with pictures or symbols; no screen. **Price guide: £399.** Available from: *Liberator Ltd., (as above)*

Spokesman – Small, lightweight aid with direct access through 1 to 17 keys, depending on model. Scanning not available, but uses up to 2 switches on a “one switch per message” basis. **Price Guide: £475.** Available from: *Easiaids Ltd., (as above).*

Talking Buddy – Single-message communicator, similar to the BIGmack, but based on the TASH Big Buddy. Can be connected to an external switch. Can record message up to 20 seconds of digitised speech. **Price guide: £69.** Available from: *Cambridge Adaptive Communication*, (as above).

Ultimate 8 – Lightweight communicator with 8 messages of 4 seconds each accessed by keypad. Can be used with a switch, but only 4 messages can then be accessed. **Price guide: £180.** Available from: *QED*, (as above).

Zygo Macaw 3 – Digitised speech aid (9 minutes recording time). 2 Models:- one for direct access only, and one for direct access and/or switch-scan switch access. Allows 2,4,8,16 or 32 message locations; can be used with pictures or symbols. Some pre-programmed vocabularies available. No screen. Extra memory modules available. **Price guide: £1,630.** Available from: *Toby Churchill Ltd., 20 Panton Street, Cambridge CB2 1HP, Tel: 01223 576117.*

Zygo Parrot – Small digitised speech aid (32 to 64 seconds recording time), offering 16 message locations only. Can be used with pictures or symbols, no screen. 2 models: – Direct or Switch-scan access. **Price guide: £650.** Available from: *QED*, (as above).

Zygo Secretary – This is a text-based communicator, identical to the Memowriter, but with the facility for recording up to 20 messages using digitised speech. There is a total recording time of 64 seconds. **Price Guide: £1,421.** Available from *QED*, (as above).

Synthetic Speech Aids

Lightwriter(s) – A range of text-based communication aids with synthetic speech (choice of three speech qualities/ prices – *DECTalk* available) and memory for storage of large numbers of messages. Single line screen, one facing the user, and one facing the ‘listener’, with options for extra-bright screens; QWERTY or ABC keyboard layout; two keyboard versions, for deaf-blind users. Switch-Scanning versions available (different versions) Small (portable), ‘medium’ (wheelchair tray size) and ‘giant’ size devices available. Large memory, supportive typing features (e.g. prediction, smart punctuation), highly adjustable settings. **Price guide: £750 to £1725**, depending on model. Available from: *Toby Churchill Ltd.* (as above)

Digitised and Synthetic Speech Aids

DeltaTalker – Successor to the *TouchTalker* and *LightTalker*, allowing direct selection through keypresses and headpointer, and switch access to 8, 32 and 128 locations. Most output is by synthetic speech (*DECTalk*), but can record up to 150 seconds of digitised speech for “special messages”, e.g. greetings and introductions. Includes auditory prompting and icon prediction, and supports Minspeak applications. **Price Guide: £4,985.** Available from *Liberator Ltd.* (as above).

DynaVox 2 – Portable but heavy digitised and synthetic (*DECTalk*) speech aid based on design of a laptop computer, using a built-in symbol library of ‘Dynasyms’. Dynamic display system allows message screens to be configured to different numbers of locations of different sizes on each display, with the user ‘stepping through’ to new screens of symbols, as s/he talks. Can be used as a touch-screen, by joystic, or by switch-scan access. The *DynaVox3100*, an even more powerful device, will be available from late 1998. **Price Guide: £4,995** (b & w, 8MB) to **£6,995** (colour, 20 MB). Available from: *Sunrise Medical*, (as above).

DynaMyte – A “miniaturised” version of the *DynaVox 2*, designed for people who are ambulant. **Price Guide: £5,995** (8MB) to **£6,495** (20 MB). Available from: *Sunrise Medical*, (as above).

ORAC – Allows 4, 8, 16, 32 or 128 locations and direct access and switch-scan access in 1 machine (and can also take the concept keyboard as external input device). Offers both digitised speech, and synthesised speech within the one machine. Two line screen. Some preprogrammed speech sets are available. Extra memory version, and disk-drive, available. **Price guide: £1,100** Available from *MARDIS*, (as above).

Vanguard – Very heavy, but powerful, dynamic display device with customised pages containing 4, 8 or 45 locations. Direct access through touch-sensitive screen and can also be used with infrared headpointer or switches. Over 15 minutes of digitised speech available, in addition to *DECTalk* synthetic speech. Can be used with *Unity* or *LLL Minspeak* applications. **Price Guide: £6950.** Available from *Liberator Ltd.* (as above),

APPENDIX 2 Communication Aids – Features

NAME OF DEVICE	ACCESSING METHOD	SELECTION SET	OUTPUT MODE	PORTABILITY
AlphaTalker	Direct Selection: Scanning	picture:symbol	digitised speech	portable
BIGmack	Direct selection	picture:symbol:text	digitised speech	highly portable
Canon Communicator	Direct Selection: Scanning	picture:symbol:text	digitised speech	highly portable
ChatBox	Direct Selection: Scanning	picture:symbol	digitised speech	highly portable
DeltaTalker	Direct Selection: Scanning, Head Pointing	picture:symbol	digitised,synthetic speech	portable
DigiVox 2	Direct Selection: Scanning	picture:symbol	digitised speech	portable
DynaVox 2	Direct Selection: Scanning	picture:symbol	digitised, synthetic speech	transportable
DynaMyte	Direct Selection: Scanning	picture:symbol	digitised, synthetic speech	portable
Eclipse	Direct Selection: Scanning	picture:symbol	digitised, synthetic speech	portable
FourTalk	Direct selection Scanning	picture:symbol:text	digitised speech	highly portable
Lightwriter	Direct Selection: Scanning	text	synthetic speech	portable
Memowriter	Direct Selection	text	none	highly portable
MessageMate	Direct Selection: Scanning	picture:symbol	digitised speech	highly portable
One-step Communicator	Direct selection	picture:symbol:text	digitised speech	portable
ORAC	Direct Selection: Scanning	picture:symbol	digitised, synthetic speech	portable
Portacom	Direct Selection: Scanning	picture:symbol	digitised speech	highly portable
SpeakEasy	Direct Selection: Modified Direct Selection	picture:symbol	digitised speech	portable
Spokesman	Direct Selection: Scanning	picture:symbol	digitised speech	highly portable
Talking Buddy	Direct selection	picture:symbol:text	digitised speech	highly portable
Ultimate 8	Direct Selection: Scanning	picture:symbol	digitised speech	highly portable
Vanguard	Direct Selection: Scanning, Head Pointing	picture:symbol	digitised,synthetic speech	transportable
Zygo Macaw	Direct Selection: Scanning	picture:symbol	digitised speech	portable
Zygo Parrot	Direct Selection	picture:symbol	digitised speech	highly portable
Zygo Secretary	Direct Selection	text	digitised speech	highly portable

APPENDIX 3 – Computer-Based Communication Systems used in the U.K.

The prices shown here are a guide only, as prices may vary with different versions or may change over time. All price guides are excluding VAT (which may sometimes not be payable, if the system is purchased by, or for use by a disabled person). It is advisable to consult individual suppliers for exact prices and details of the computer requirements for each package.

Systems are listed in alphabetical order, within each category.

For Apple Macintosh Computers

Speaking Dynamically Pro – Symbol based communication program using Mayer Johnson Picture Communication Symbols (PCS) and can import other symbols / graphics. Offers auditory scanning options. Supports different input devices (mouse, keyboard, switch-scan, touch screen), and digitised speech and different types of synthetic speech output (*Macintalk*, *DECTalk*, etc.). Will be available for Windows in 1999. **Price guide: £241.** Available from: *Don Johnston Special Needs, 18 Clarendon Court, Calver Road, Winwick Quay, Warrington WA2 8QP. Tel. 01925 241642.*

Talk:About – Text-based system, based on research from University of Dundee, MicroCentre, in which ‘stories’, and decisions about who you might want to say what to, and in which style – informal, formal, humorous, etc. – structures how messages are stored and recalled. **Price guide: £335.** Available from: *Don Johnston Special Needs* (as above).

For IBM PC Compatible Computers

Clicker 3 – Latest in a family of programs, providing an on-screen keyboard, speech output, and the ability to use text, or graphical displays. Although not designed as a communication aid, it could be used for communication. **Price guide: £79.** Available from: *Crick Software Ltd., 1 The Avenue, Spinney Hill, Northampton NN3 6BA. Tel: 01604 671691.*

Talking Screen – A pictographic communication program with pages of symbols. Actions are assigned to symbols, e.g. to speak a message, go to another page. Auditory cues are available and programme can be accessed by mouse, touch screen and switches. **Price guide: £1,030** including PCS symbols. Available from: *Cambridge Adaptive Communication*, (as above).

WINSPEAK – A symbol based communication program using IBM compatible computer under Windows. Utilises any symbol libraries or pictures in electronic form. Speech output, supports digitised and synthetic speech and a wide range of special access methods. **Price guide: £150.00.** Available from: *The Foundation for Communication for the Disabled, Hassell House, Link Industrial Estate, Howsell Road, Malvern WR14 1TF. Tel: 01684 576188.*

Writing with Symbols – A Windows program designed mainly for writing, rather than communication, with speech output providing a simple supported symbol-processor, where words and symbols (Rebus, or other symbol libraries if installed) are automatically matched, with full control of fonts, colours, symbol size and thicknesses, personalised word lists etc. **Price Guide: £85** with basic Rebus symbols to **£145** with full set. Available from: *Widgit Software, 102 Radford Road, Leamington Spa, Warwicks.CV31 1LF. Tel: 01926 885303*

Integrated Systems

These generally come as a package comprising a computer, software and possibly an access system. The advantage of an integrated system is that compatibility can be assured, the ‘trailing wire syndrome’ kept to a minimum, and ‘friendliness’ and ease of use are facilitated. Integrated systems may more easily be wheelchair mounted.

Cameleon II – Wheelchair mountable, rugged PC compatible lap top with Words+ communication software (*EZ Keys / Scan WSKE / Talking Screen*), switch-scan input and speech output. **Price guide: £5,650.** Available from: *Cambridge Adaptive Communication*, (as above).

Cameleon CV – Smaller, lighter version of the Cameleon designed for an ambulant user. **Price guide: £6,000** (excluding software). Available from: *Cambridge Adaptive Communication*, (as above).

Alternative Access to Communication Aids

Deborah Jans and Sue Clark

This paper will endeavour to bring together the issues and facts about alternative access for use with communication aids. Although it is not the intent of this paper to discuss other forms of technology such as computers and environmental controls, some of the same principles will apply. For more information on alternative access to computers, see the end of this chapter.

Switch Access Issues

For many individuals with a severe communication impairment and severe physical limitations, indirect access methods, such as scanning may be the only way to access technology. Indirect selection via scanning requires the user to activate a switch or number of switches connected to the communication aid. The device must be able to accept a switch and have some type of scanning array available to the user, see *Appendix 1*. There are many issues that need to be considered for the use of a scanning system:

- **user's motor skills and positioning**
- **switch activation site**
- **positioning and mounting of switch**
- **size of switch**
- **switch feedback**
- **user's control.**

It is important to note again the importance of a full assessment by a multidisciplinary team before embarking on a switch access programme. Input from physiotherapists and bioengineers, as well as from speech and language therapists and occupational therapists, may be important as the switch user must be positioned correctly in order to exert maximum control over their switch.

Motor Skills and User Positioning

Most potential users will change their position daily and for different activities. In order to utilise an indirect access method, the user must be in a comfortable position in which they also feel secure. In addition, usually the user will need to be in a position which allows for an adequate view of the equipment, eye contact with other people and awareness of the surrounding environment. The multidisciplinary team will need to evaluate the appropriate position and seating system for the user to maximise their full motor capabilities. This may include specific positioning aids such as splints, arm rests, head and/or foot rests etc.

Switch Activation Site

When identifying a switch activation site, it is important to choose a site which the user can access efficiently using a reliable motor movement. Different areas of the body should be assessed looking first at accessing with the hand or finger as this seems to be the most 'socially acceptable' site for switches. If this site is not accessible then other switch sites such as the head, shoulder, elbow, feet, legs and knees should be investigated. In addition, the tongue, cheek and chin can be used as switch sites and there are now specific switches manufactured just for this purpose. Once a reliable switch site is identified, the switch will need to be positioned and mounted.

Positioning and Mounting of Switch

Once a suitable switch and activation site have been identified the best method of mounting the switch requires to be established. Avoid complicated mounting systems, if at all possible, so that it is easy for a variety of people to be able to mount the switch. First look for mounting sites on the user's existing equipment. Often a piece of *Velcro* can be stuck down to this equipment with the opposite side stuck to the switch. Wheelchair trays, either on top for use with a hand or underneath for use with a knee are suitable sites. Headrests can be used for head switches and the inside of armrests can be used with a switch strapped to the thigh. If there is no suitable site on the user's existing equipment then a specialised mounting system needs to be used. These systems often take the form of multi-jointed arms which can be screwed onto a chair or table and then bent into the correct position for the user.

Size of Switch

It is best to try and find the smallest size of switch that the user can access so as not to interfere with other pieces of equipment the user may depend on at different times of the day. However, a large switch may be

This is a revised version of a paper which first appeared in Communication without Speech (1996)

required to allow for a big enough surface area for the user to access the switch.

Switch Feedback

It is important to identify what type of feedback from the switch the user may require. Is touching the switch surface and/or seeing its effect enough, or does the user require audible feedback, such as a click or a beep? It should be noted here that auditory and visual feedback may also be available through the communication aid to which the switch will be connected. Tactile feedback may also be helpful for the user as s/he may be able to feel some resistance when the switch is pressed. There are other switch features which are important to take into account. They are summarised in Table 1.

User's Control of Switch

Once the placement of the switch has been identified, the user's control of the switch for scanning purposes will need to be addressed. Initially the user may use the switch for 'cause and effect' training and practice. Activities which encourage activating a switch to make something happen should be introduced. Once this has been mastered, the user may be able to cope with activities that involve timing. The following three components have been identified as essential to consider when introducing switch timing activities:

- the user must be able to wait for the right moment
- the user must be able to activate the switch, noting the type of switch and the length of time it takes to activate the switch
- the user must be able to release the switch accurately and efficiently

The speed with which an individual can activate the switch using a scanning array will need to be adjusted as the user becomes more familiar and adept at using the switch.

Each of these factors can be addressed using switch operated appliances or battery operated devices connected to a switch. It is important to identify what the user will be most motivated by, for example, music playing on a tape recorder, a toy moving or barking, or a light going on and off.

When discussing indirect selection, it is important to have an idea of the different types of switches available to an individual user. Switches come in many varieties and can be customised to suit each individual. Switches may come in single, double, four way or multiple configurations.

For a list of switches and a description of those now available commercially please see *Appendix 2*.



Table 1. Switch Features

Contact type	Switches may be activated by different types of contact such as up / down touch, side to side touch, push or pull, tilting, pressure, squeezing, swiping, suck / blow etc.
Contact / non contact	Some switches operate on non-contact methods such as infra-red detection, heat, eye movements, breaking a light beam. These tend to be more complex and delicate to use and may be expensive.
Sensitivity	Some switches are designed for light pressure while others for heavy duty use such as a foot switch. Some switches offer an adjustment for varying sensitivity adjustment.
Robustness	Switches should be robust in their outward construction and internal wiring. Most users will be transporting their switches daily and any switch should be hard wearing.
Length of travel	Some switches require a tiny press while others have to be pressed down a long way to operate.
Activation type	Switches can be set up in different ways and each user will need the right type of setting for them. Some switches are normally OFF and only activate when pressed. Some are normally ON and only activate when pressure is removed. There are also switches that operate momentarily, or stay on as long as the switch is activated, while others can be 'timed' to stay on for a set period however long the switch activation. In addition, some switches may stay on until a second switch activation switches them off again (latched).

Customising Switches: If it is not possible to find a commercially available switch and/or mounting system for an individual user then it is possible to have something specially made by a Bioengineering Department or Rehabilitation Engineer. This may be costly and time consuming so commercially available products should always be considered first. These commercial products may then be adapted to suit an individual user rather than starting to design a completely new input device. Due regard should always be given to health and safety regulations.

Alternative Access to Computers

Computers and other technological devices can be adapted to suit an individual user's needs by altering keyboards and/or input devices.

Different types of keyboards are available that either allow for keys that are larger and/or more widely spaced, or mini keyboards for individuals with good fine motor control, but limited range of movement. Ergonomic keyboards may be useful for head / mouthstick, single or two handed operation where a standard QWERTY keyboard layout may be difficult to access. Standard keyboards can also be adapted by the use of keyguards and/or wrist rests. In addition, some software utilities allow you to change the configuration and/or response of the keyboard to suit an individual's needs.

Other alternative input devices that are available include touch screens, mice, trackerballs, joysticks, head pointers and mouse pens. Voice input as an alternative to a keyboard is also now available.

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APPENDIX 1

A Selection of Dedicated Communication Aids and their Indirect Access Methods

Dedicated Communication Aids and their Indirect Access Methods

	Single switch	2 switch	Joystick	Head pointer	Icon prediction
AlphaTalker	✓	✓	X	✓	✓
BIGmack	✓	X	X	X	X
Canon Communicator	✓	X	X	X	X
ChatBox	✓	✓	X	X	✓
DeltaTalker	✓	✓	✓	✓	✓
DigiVox	✓	✓	X	X	✓
DynaVox 2	✓	✓	✓	X	X
Lightwriter	✓	✓	X	X	X
Macaw	✓	✓ ¹	✓	✓	✓
MessageMate 20 / 40	✓	✓	X	X	X
MessageMate 8	✓ ²	✓	X	X	X
Orac	✓	✓	✓	✓	✓
Portacom	✓	✓	X	X	X
SpeakEasy	✓ ²	✓	X	X	X
Spokesman	✓ ²	✓	X	X	X
Talking Buddy	✓	X	X	X	X
Ultimate 8	✓	X	X	X	X
Vanguard	✓	✓	✓	✓	✓

¹Up to 5 switches can be used.

²One switch per message

APPENDIX 2

Switch Selection

Provided a person can make a consistent voluntary movement with any part of their body it should be possible to find a suitable switch for them to use: – movement of hand, foot, head, eyeblink, suck, puff etc. or even sound can be used.

It is important that the person is positioned correctly so that they can exert maximum control over the switch. The switch may need to be mounted. Some people find an auditory or a tactile feedback helpful. Some users will only be able to access a single switch, some two or more.

Different pieces of equipment require different connectors from the switches. If the right switch has the wrong connector it is often possible to use a switch adaptor – i.e. 1/4" to 1/8" or 1/8" to 1/4". To connect a switch or switches into a computer – PC, BBC, MAC etc. – a special interface box is required (different for each type of computer). Some manufacturers like Possum make switches with connectors specifically for their own equipment.

A Selection of Switches Currently Available

Lever Switch – a light action microswitch mounted in a small box which is pivoted at one end and can be operated by hand, chin, head, headpointer etc. Tactile and auditory feedback. Come in different sizes. £37 – £66. Available from QED, TFH, Liberator.

Latching Switch – once pressed stays 'on' or 'off' until pressed again. Operated by hand, head etc requires a little pressure. Tactile and auditory feedback. £37. Available from QED.

See-saw Switch – box pivots at mid-point to give a different switch output at each end. Operated by hand, chin, headpointer etc. Tactile and auditory feedback. £34 – £80. Available from QED, Liberator, Don Johnston.

Click Switch – a small, low cost mechanical switch with 5 different pressure settings and two screw holes for optional mounting. Operated by finger, chin, headpointer etc. Tactile and auditory feedback. £15 approx. Available from Toby Churchill.

Specs Switch – brightly coloured (red, blue, green, yellow, pink, purple or black) switch 1 3/8" diameter, 1/2" high. Sensitive to 1oz pressure. Comes with standard flange mount, space-saving flush mount and strap mounting plate (strap included). Tactile and auditory feedback £40. Available from Ablenet.

Jellybean Switch – brightly coloured (red, blue, green, yellow, pink, purple or black) switch 2 1/2" diameter, 1" high. Sensitive to less than 2oz of pressure but robust. Tactile and auditory feedback. Holders for 2 or 4 'beans' available. Switch £39; holder for 2 beans, £30; holder for 4 beans £40. Available from Ablenet.

Big Red Switch – also comes in yellow, green and blue, 5" diameter, less than 1 1/2" high; sensitive to less than 3oz of pressure, made of shatterproof plastic. Tactile and auditory feedback. £39. Available from Ablenet.

Buddy Button – brightly coloured (red, green, purple, pink, yellow or blue) switch, 2 3/8" diameter, 1/2" high. Sensitive yet robust. Tactile and auditory feedback. This is a Tash switch. £39. Available from CAC.

Large Button Switch – single, double or 4-way. Requires light pressure but very robust. Tactile and auditory feedback. Operated by finger, fist, foot etc. £34 – £61. Available from QED, TFH.

String Switch – loop of string attached to a switch box. Requires very little movement and minimal strength. Tactile and auditory feedback. £30. Available from Ablenet.

Wolfson Touch Switch – a metal plate, which can be of any size, is connected to a small box of electronics. The switch will remain on as long as it is being touched by any part of the body. On the box there is a LED indicator to show the status of the switch and a sensitivity adjustment screw. £82. Available from QED.

Pal Pad – robust, low-profile switch available in various colours. £32. Available from QED, CAC.

Touch Pad – different sizes, can easily be activated by slight touch from any part of the body. From £20. Available from CAC, TFH.

Foot Switch – robust to take activation with a foot, wood or metal covered with non slip rubber. Tactile and auditory feedback. £15 – £19. Available from Toby Churchill, QED, TFH.

Contact Switch – just contact the switch with any part of the body, including the tongue, and it will operate, needs power (mains or battery). From £49. Available from *Toby Churchill, CAC*.

Wedge Plate Switch. Very sensitive touch plate requiring no physical pressure. Can be touched by any part of the body but most often hand £77.50. Available from *TFH*.

Wooden Block Switch – large, durable wooden switch which has a light positive action. Tactile and auditory feedback. £25 approx. Available from *QED*.

Wobble Switch – a robust switch which has a flexible spring extending from one end. Spring moved or bent in any direction will operate the switch. Used with hand, chin etc. Tactile and auditory feedback. £80 approx. Available from *QED, CAC, Liberator*.

Grasp Switch – hand held switch which is activated by squeezing. Some have a 1” diameter rubber hand grip, others are made of metal which flexes when squeezed. Tactile feedback. £23 – £85. Available from *QED, CAC, Toby Churchill*.

Thumb Switch – a hand held switch which is activated by depressing the raised button on the end with the thumb. Tactile and auditory feedback. £22 – £55. Available from *QED, TFH*.

Joysticks – various models can be operated by hand, chin etc. Can have self centring action and gates to limit movement. Can operate up to 5 switches, used with hand, chin etc. £58 – £230. Available from *QED, Liberator*.

Pillow Switch – smooth foam surface for cheek or chin contact. Can pin or velcro to pillow or clothing. Tactile and auditory feedback. £70. Available from *CAC*.

Pressure Switch – a pressure pad/ball is connected to an air pressure switch which can be adjusted for sensitivity. Used with hand, elbow, chin etc. Tactile feedback, £82 – £153. Available from *QED, Liberator*.

Pressure Mat – activated by air pressure. User can stand on it or roll onto it, different sizes. Tactile feedback £20. Available from *QED, TFH*.

Suck-Blow Switch – operates either one or two switches using suck and/or puff. £82 – £150. Available from *Toby Churchill, QED, TFH*.

Eye-Blink Switch – safe infra-red system which detects eyelid closure. Mounted on spectacle frames which will fit over normal glasses. Auditory and visual feedback. £276. Available from *Toby Churchill*.

Mercury Switch – a small movement triggers the switch, often mounted on a wrist or head band. £22 – £30. Available from *QED, TFH*.

Sound Operated Switch – speech or sound operates the switch £92+. Available from *QED, TFH*.

Necklace & Bead Switch(es) – Necklace (different lengths available) fits round neck. Bead(s) fit onto necklaces, beads come in varying sizes between 3” and 1 1/4” and different colours for coding. Originally designed for use with electric wheelchairs. Suitable for people with good head control but poor coordination in the rest of their body. Need to specify type of jack plug plus length of cable. Tactile and auditory feedback. Necklace £16, each bead £20. Available from *Dudley Controls*.

Suppliers

Cambridge Adaptive Communication (CAC), The Mount, Toft, Cambridge CB3 7RL. (Tel. 01223 264244, Fax 01223 264254).

Don Johnston Special Needs, 18 Clarendon Court, Calver Road, Winwick Quay, Warrington WA2 8QP. (Tel. 01925 241642, Fax 01925 241745).

Dudley Controls Ltd., 10 Peverel Drive, Granby, Milton Keynes MK1 1NL. (Tel. 01908 640777, Fax 01908 374218).

Liberator / Ablenet, Whitegates, Swinstead, Lincolnshire, NG33 4PA. (Tel. 01475 550391, Fax 01475 550357).

Quest Enabling Designs (QED), Ability House, 242 Gosport Road, Fareham, Hants. PO16 0SS. (Tel. 01329 828444, Fax 01329 828800).

TFH Ltd., 76 Barracks Road, Sandy Lane Industrial Estate, Stourport-on-Severn, Worcs. DY13 9QB. (Tel. 01299 827820, Fax 01299 827035).

Toby Churchill Ltd., 20 Panton Street, Cambridge CB2 1HP. (Tel. 01223 576117, Fax 01223 576118).

Laying the Foundations of Communicative Competence for very Young Children

Alison MacDonald and Caroline Rendle

How do we ensure that young children with severe physical disability, particularly those who require some form of augmentative communication, eventually become competent as communicators?

The framework for approaching augmentative and alternative communication work with very young children presented in this workshop was one that we put together for a project with some two-year-old cerebral palsied children carried out at Queen Margaret College in 1991. The principal aim of the project was to investigate the requirements of the speech therapy complement to early education groups for cerebral palsied children, particularly for those children with severe speech production difficulties.

There are some important considerations which cause an obvious dilemma both for professionals and families working with these young children.

Firstly, there is the reluctance of any therapist to dismiss, at too early an age, the possibility that the child might eventually be an oral communicator and also an even greater reluctance on the part of parents to believe that their son or daughter will not use the same means as everyone else to communicate.

Against this, however, there is increasing evidence that points to the importance of starting augmentative communication programmes early:

- before the child misses out on rich linguistic and interactional experiences
- before they become frustrated at their inability to make themselves understood at a satisfying level
- before they have settled into the role of a passive spectator

At the start of the Edinburgh project, we therefore wanted to create a framework that would help us to work on a balanced programme of skill areas that *could* lead towards eventual competence in augmentative communication but into which the development of spoken output could *also* fit. First we need to ask:

What makes an AAC User a Competent Communicator?

Janice Light who has written extensively from her research and practical experience in North America, suggests that eventual Communication Competence has four major components:

Linguistic Competence: adequate mastery of the native language (vocabulary and grammar) plus mastery of the code (e.g. signs or symbols) required to operate the AAC system.

Operational Competence: mastery of technical skills required to operate the system - i.e. the motor and cognitive skills required to signal a message or to operate specific device features (pointing, signing, visual scanning, operating switches, controlling cursors, editing, etc.).

Social Competence: knowledge and skill in the social rules of communication, for example making appropriate eye contact, sharing the balance of talking and listening, and using communication for a range of different purposes - social chat, requesting items, responding to others, contradicting people, etc..

Strategic Competence: flexibility in order to adapt communicative style to suit the receiver (e.g. signing more slowly to strangers, turning up the volume on your communication aid for grandad), or learning how to repair and extend the conversation (e.g. if you can't explain something clearly on your *TouchTalker*, you might have a message that says, "Please hold up my Bliss chart, I'd like to explain something").

We felt that if we could highlight some of the essential early skills which need to be developed to support these facets of competence and also widen Light's concept of Operational Competence to include the speech apparatus (as tools with which we communicate), then it should be possible to create a framework for the introduction of a broad spread of early communication skills within which a range of signalling tools (including vocal as well as manual, visual and others) can be facilitated as appropriate.

The eventual model is shown in Figure 1, a pyramid of skills towards eventual communicative competence.

Under Linguistic Competence we feel that it is important to look specifically at the development of Symbolic Understanding as this is going to influence the choice of augmentative system. The stages suggested here

This is a revised version of a paper which first appeared in Augmentative Communication in Practice: Scotland – Collected Papers, 1992

Figure 1.

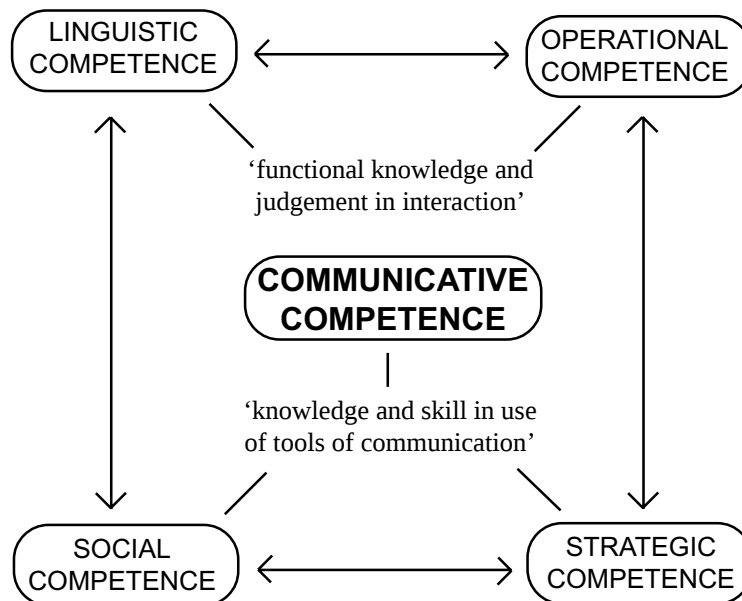
Language Development
Symbolic Understanding
System Introduction

Cause and Effect

Vocal: neuromotor
speech processing

Visual: eye pointing
tracking
scanning
E-tran

Manual: chart indication
switch operation
aid operation



Power of communication
Eye-contact
Turn-taking
Greeting
Yes/no signalling
Responding
Requesting object / action

Modality flexibility
Initiating strategies
Signalling
breakdown
Contradiction
Providing
clarification

Alison MacDonald (1991) developed from the original work of Janice Light (1989)

are influenced by the work of Cooper, Moodley and Reynell (1978) and DeLoache (1987). For extension of this model and additional notes see page 26.

Early skills towards Strategic Competence will include fostering the ability to move easily from one mode of communication to another as necessary (e.g. from chart to communication aid), the ability to initiate an interaction and the understanding that it is sometimes necessary to clarify ones meaning in a way that it is clear to the receiver. In conjunction with this model the video clips shown in the original workshop emphasised:

- how a range of skills can be targeted without focusing too narrowly on one particular aim
- how this can help us to ensure that we are constantly keeping a balance across the different competence areas and that all activities we offer are designed to provide a truly integrated programme

Examples of some early skills that were facilitated in video clip 1:

S R is seen on the video with his mother supporting him and the therapist playing through a sequence of an imaginary meal time, using large doll material. S R is actively involved and at the end 'talks through' this play sequence using photos as a prompt to his recall.

Skill / Aim	Example
Attention	Throughout
Symbolic	Large doll material representing real objects. Matching large doll material to photos
Linguistic	Therapist using variety of words, e.g. nouns, negatives, object functions at 2-word level
Vocal	Vocalises to acknowledge therapist's remarks. Vocalises to make a request to therapist, e.g. 'Ask A for a chair'. Symbolic noises during play, e.g. [m:] blowing on hot dinner. Vocalises to complete therapist's utterance when retelling play sequence
Visual	Eye-pointing to photos in choice making

Skill / Aim	Example
<i>Manual</i>	Fist pointing to reinforce vocalisation and eye-pointing, compensating naturally for lack of intelligibility
<i>Yes/No</i>	Says 'Aye', but no evidence of 'No'
<i>Responding</i>	Looks for lost spoon in response to therapist's comment Smiles at therapist's suggestion to cuddle dolly
<i>Power of Communication</i>	Uses photos to relay information to another person
<i>Object Request</i>	Selects from forced alternatives, from two or three photos
<i>Social</i>	Passes information to a third person using appropriate eye contact, acknowledges therapists comments throughout
<i>Past / future</i>	Reflects on past using photos as a prompt

Examples of some early skills that were facilitated in video clip 2:

On the video, I B is sitting in a corner seat operating a BBC computer using a Wolfson touch switch. The program in use was Brilliant Computing's *Switch On*.

Skill / Aim	Example
<i>Visual</i>	IB has to scan 7 photos on E-Tran frame and eye-point to the correct one
<i>Vocal</i>	Used to confirm adult interpretation of eye-pointing
<i>Manual</i>	Uses Wolfson switch to operate computer
<i>Social</i>	Looks at M to receive her choice
<i>Responding</i>	Passes on information re M's choice to A
<i>Object Request</i>	Indicates own choice
<i>Yes/No</i>	Says 'Aye', but no evidence of 'No'
<i>Anticipation</i>	Looks at computer screen and waits patiently for next step
<i>Attention</i>	Sustained throughout
<i>Cause/ Effect</i>	Understands relationship between switch and computer
<i>Symbolic</i>	Use of photos to represent computer graphics
<i>Power of Communication</i>	Understands use of photos to convey his interests and to get what he wants

References

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- Light J (1989) *Toward a Definition of Communicative Competence for Individuals using Augmentative and Alternative Communication Systems* AAC Vol 5 (2).
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The Child, Education and Augmentative and Alternative Communication

Sally Millar

There are now many children in Scotland who use AAC systems, both low and high tech, as educational aids. Some are in special schools and units, either as individuals or in groups of AAC users. Increasingly, AAC users are educated in local nurseries and mainstream primary and secondary schools. A common pattern for mainstream education is for a single AAC user in a local school to be supported by a special auxiliary and/or a SEN or Learning Support teacher on a daily basis, and by a visiting speech and language therapist on a once or twice weekly basis.

This paper cannot cover all of the issues that arise for all children with very different types and complexities of special educational needs, but discusses some key stages in the school life of various types of AAC user, highlighting some priority areas for planning, and some suggestions about supportive approaches and resources.

Setting the Scene

For children in school, using an augmentative communication system effectively is not an end in itself, but a means to many ends, such as participation in the classroom, access to the curriculum, play, friendship, learning, thinking, pursuing interests. For AAC to be effective, attention needs to be paid to the continual change in the life of a child and to the way people and systems work around the child as much as to the actual AAC system chosen. Careful assessment is important, but there is probably no 'best' or 'right' AAC system for an individual, but only 'workable' systems. In some cases, there may be an argument for starting early with a powerful communication aid that can 'grow with' the child, although in other cases the argument may be for a range of very simple pieces of communication technology that staff find easy to use in a variety of different situations and that are cheap enough to be 'replaceable' later as the child's needs change. What really counts is the way technology is *used*, not the technology itself.

Sometimes there seems to be so much to learn, and so little time in the classroom – after all the competing demands of physical care, eating and drinking, special therapies, medical care, travel, etc. – that there appears to be little hope of fitting in all the necessary teaching and learning experiences!

Overcoming barriers, setting educational and communication priorities and implementing appropriate strategies and methods for AAC use in education involves making choices and compromises. This requires all of the professionals involved to work very closely together, not forgetting partnership with parents and families.

Working Together

Firstly, all children who need or use AAC should have Records of Needs / Statements. Educational psychologists can help by presenting children's special educational needs in the Record not as a disjointed collection of separate reports from therapists and teachers but as an integrated set of educational aims which incorporate speech, language and communication (including AAC) aims.

Much lip service is paid to 'teamwork', but a recent Scottish Office Report¹ suggested that collaboration between speech & language therapists and education staff is all too often "more apparent than real" (p30); if so, the child suffers. Communication and language cannot be separated from learning generally; all educational attainments will be enhanced as communicative competence increases, and vice versa. Communication is a key element in each area of the curriculum. The child in school needs an integrated 'AAC in education' programme, not a separate 'AAC programme' and an 'education programme' which proceed independently and which are somehow supposed to come together 'later'. Can the 'traditional' ways of working cope with the creation of integrated programmes and integrating long term and short term AAC goals into the child's IEP (individualised educational programme)?

Professionals often engage in multidisciplinary team working. Although they are aware of each other's work and share information about goals and outcomes, they work with the child separately, on their own programmes, in parallel. The danger is that they may be duplicating some processes (e.g. assessment and reporting) while leaving gaps or mismatches elsewhere. It may be difficult to integrate their various activities, and the child may become overloaded or confused.

In *interdisciplinary* working, which is a much more appropriate approach for AAC users, professionals aim to provide a highly integrated approach by incorporating each other's viewpoints and goals within their own

This is a revised and updated version of a paper which first appeared in Communication without Speech (1996)

activities. Joint assessment, identification of priorities, planning and reporting prevent duplication of work and confusing overlap for the child.

Underpinning Warnock² was the implication that liaison between different professionals in education was straightforward. But professionals are not trained in collaboration – it is difficult and it takes time (although early investment of time in joint work may save time and work later, in the long term). Furthermore, unless collaboration also takes place at the level of pre- and post-qualification training, policy making and funding, management, contracts between purchaser / provider, and school level contracts between schools and their therapists, the collaborative efforts of professionals ‘on the ground’ are made harder³.

A recent Scottish publication⁴ provides guidelines and ideas for good practice in the education of children using AAC and stresses the need to establish AAC use firmly as an educational issue rather than something that is viewed solely as a speech and language therapy responsibility. Similarly, a group in England is working on developing guidelines for *AAC Policies in Special Schools*⁵ Some schools already have such AAC policies, but there is a further step to be taken before policies are translated into curricula.

AAC and the 5-14 Curriculum

The Scottish 5-14 curriculum provides the foundation for a shared common framework for joint working, but is insufficiently detailed on early language and communication skills and needs to be differentiated, individualised, adapted and elaborated for children needing or using AAC, particularly those working within Level A. McIlhenney⁶ showed an example of how to expand 5-14 by adding curricular areas to better match the priorities and needs of pupils with complex learning difficulties.

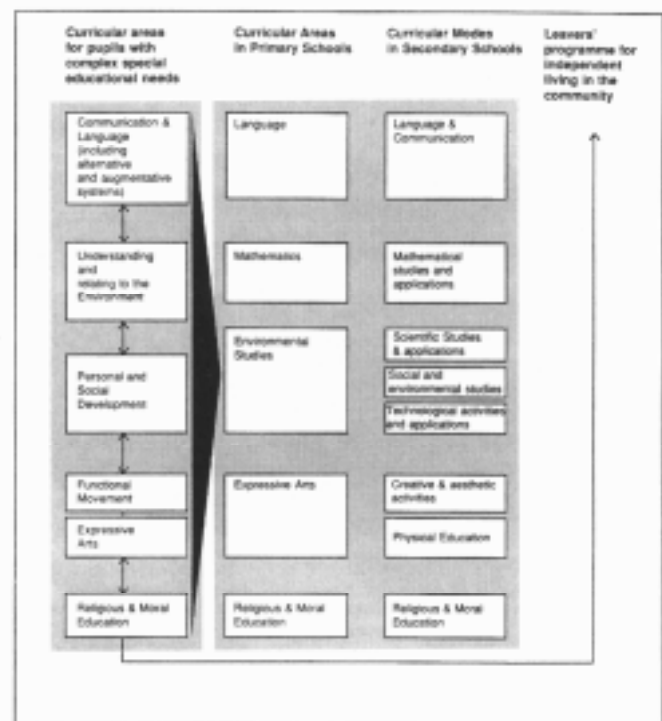
A team from 3 education authorities in Ayrshire⁷ have further elaborated upon this for pupils with complex learning difficulties. Within ‘Communication and Language’, an attainment outcome of ‘interaction’ has been added, and ‘reading’ and ‘writing’ have been replaced by ‘pre-reading’ and ‘pre-writing’. Interaction includes strands and targets such as: ‘Accepting and Sharing Feelings’, ‘Attending and Responding’, ‘Vocal and Gestural Production’, ‘Turn Taking’, ‘Concept Development’, ‘Interactive Play’. The pre-reading attainment outcome (reading for enjoyment) starts at the level of “looks at a single picture for a few seconds” and works up to “takes part in reading by filling in words in favourite stories”.

Other schools with pupils using AAC at different levels have started to develop the curriculum for their own pupils in a similar way, but there is an urgent need for more training and support for teachers in the area of curriculum elaboration and differentiation for pupils with special communication needs.

Different Perspectives of AAC

We cannot assume that everybody around the child shares the same perception of what AAC is for, and what it can do. One young child with severe communication difficulties was shown to interact regularly with 24 adults each day, plus classmates and other children. (For children in ‘split placements’ that number may be almost doubled.) Over a period of a few years, with natural annual progression from class to class and with high levels of staff turnover, several more different therapists and teachers may be added to the list. It’s easy to see how continuity over time is difficult to achieve and how at any given time a number of different (conflicting?) aims and strategies regarding communication may be in operation. The AAC approach must attempt to identify, accommodate and coordinate these diverse perspectives. Otherwise there is a danger that the child will learn not overall communicative competence but only skill ‘fragments’ from different people – for example, he/she may learn to use an AAC system simply to ‘perform’ in class or therapy – for example, for answering questions, or completing structured language exercises, but be unable to use it for any of the other functions of language such as initiating conversation, requesting, commenting, asking questions, changing topic, creative writing, interacting socially and playing with family and peers, terminating conversations – i.e. expressing him or herself fully.

Expanded 5-14 Curriculum (after McIlhenney)



Planning Implications

The points raised above highlight some important issues:

- AAC goals need to be identified and agreed amongst many people, not just by class teachers and/or speech and language therapists.
- AAC goals need to be specific, clear and explicit – they cannot be assumed to be ‘obvious’.
- AAC teaching and learning will be carried out by many different communication partners, so programmes need to be manageable and practical.
- AAC goals / outcomes need to align with attainments specified in the curriculum and the child’s IEP, and should be divided into short, medium and long term. To take a concept development goal:

Short Term

Understanding and Relating to the Environment: *Week 1 – 3 of each term – learns and practises 8 new symbols related to the term’s specific theme (first one is ‘water’), using a special 8 location topic symbol / word chart.*

Medium Term

Communication and Language – Talking & Interacting: *By the end of term, can use topic chart/VOCA with theme symbols on overlay in discussion.*

Personal and Social Development: *Participates spontaneously in class group at discussion sessions, using these. Can transfer use of this vocabulary to water-related play and story sessions appropriately.*

Long Term

Communication and Language – vocabulary development: *By end of Year – has integrated selected key symbols / words from the 3 terms’ themes into personal vocabulary on ORAC and can use these reliably in a range of play, social and story-reading settings.*

- AAC learning and use needs to be part of everyday life, not set as ‘work’ to be done occasionally.
- There needs to be an agreed ‘co-ordinator’ (or small team) of the AAC in education programme, planning, monitoring progress, ensuring continuity and with the time and authority to contact everybody and to follow things up, ensuring that recommendations are carried out.
- There needs to be an agreed ‘key person’ who is in daily contact with the child and all of the other regular communication partners around the child, who is able to monitor daily events and deal with practical issues that arise, immediately.
- School management teams need to recognise that time needs to be scheduled for management and implementation of an AAC in education programme – this is not a trivial task that can be squeezed into marginal ‘free’ time like coffee breaks.
- Since she may spend most time in 1:1 with the pupil, there needs to be recognition of the importance of the special auxiliary for an AAC child participating in programme planning meetings, Record of Needs reviews, staff development sessions and specialised consultations and training courses etc. (i.e. not to be paid only for ‘contact hours’ with the child).
- The speech and language therapist should be included as a member of any ‘school development plan’ working group engaged in elaboration of the curriculum, so that AAC is ‘built in’ not ‘tacked on’ later as an afterthought.

Early Primary Priorities

The ‘passive spectator’ syndrome is one of the greatest dangers threatening pupils with communication difficulties.

○ Active participation

The ‘passive spectator’ syndrome is one of the greatest dangers threatening pupils with communication difficulties. Even if they do not yet have a fully functioning AAC system, children must from the start be encouraged to participate and contribute, using whatever means of communication they have at their disposal, e.g. eye-pointing, gesture, indication of pictures or symbols. They will need communication opportunities to be specially structured for them by adults, to develop their confidence and spontaneous expression.

○ Use of pictures and symbols

Sometimes parents or teachers think that using symbols will distract the child from learning to speak or to read letters and words. It is important to remember that all children need language to communicate expressively from about 1 year on. Even if a child is expected to read eventually, he/she could not realistically be expected

to communicate entirely through the written word until at least about 9 years old (and much later, if ever, for some), so a huge gap develops in a non-speaking child, between their understanding of language and their ability to express themselves – a gap occurring precisely at the ‘critical period’ for language development. Symbols can help to fill that gap and ensure that the processes of acquiring language, learning to interact, and laying the foundations of later literacy are carried on while waiting to see how speech and reading develop.

Symbols can play a valuable role in developing emergent literacy, for example helping the child to learn to attend to marks on a page and to know they carry meaning; training visual discrimination and visual memory; learning to ‘read’ from top to bottom, left to right; and giving children the pleasure of ‘reading for meaning’. Text should always accompany the symbol on the chart, so some children may start to acquire a basic sight vocabulary, and the symbol can be gradually ‘faded’ and disappear from a vocabulary chart leaving only the word. For others, symbol support for reading will be an ongoing strategy which builds confidence and motivation.

In some other children, symbols can improve poor comprehension of language, and can be used to help them make sense of the environment and to structure the day (e.g. through labelling items in the room and activities, creating timetables, menus and so on). Use of picture and symbol based vocabulary can support the child’s personal development and interactive communication skills, enabling them to make active and independent choices about their preferred activity, food & drink, story book, game.

○ *Access to Language*

Sometimes in amongst sorting out seating and positioning; determining the preferred selection method, access to the curriculum, choice of AAC system; learning to program and use electronic voice output aids; launching early literacy programmes etc. we can temporarily lose sight of the most important thing of all, at the heart of communication and learning – that is *language*. Children may be able to signal their needs and wants and to answer in class with preprogrammed messages, but the ultimate long term aim of education must be to provide them with true language as a tool for creative communication, for thinking, problem solving, writing.

Very young children usually do well with pictographic symbols such as PCS to ‘get their meaning across’, but for more able and older children mixing in some Bliss symbols and/or written words can help to support concept development, the use of more abstract vocabulary, and the use of basic syntax. Only a tiny percentage of the most commonly used words in spoken English are natural ‘picture producers’ so that to communicate linguistically in pictures is difficult. At this stage, use of a voice output device (with a symbol or multi-meaning icon overlay or display) can help to reinforce language use. To be linguistic as well as communicative, a system must offer the facility of sequencing and ordering words and phrases into longer and novel utterances. Mastering this is probably the single most important process of the child’s education, underpinning many other educational processes, so time spent in language development through AAC – even if it has to be at the expense of other timetabled subjects – is a good educational investment. Balanced against this is the recognition that some children will perhaps not achieve communication at a fully linguistic level but need to have a working vocabulary for functional day to day communication and social interaction. We don’t know much yet about how non-speaking children learn language, or how to predict which children are which. How and when to teach which aspects of language and communication are the core dilemmas of teachers and therapists working with AAC in education. Riding several horses at once and being constantly poised to switch horses in mid-stream just about sums up the best approach in our current state of knowledge.

○ *Access to appropriate vocabulary*

Choosing the set(s) of words and messages a child will be able to ‘say’ with their AAC system is a bit like ‘playing God’. This job should be shared between families, teacher, speech & language therapist and others, as each has their own bias. (Teachers tend to favour ‘work’ and ‘answering questions’ (colours, shapes, basic concepts, numbers); speech & language therapists favour functional interactive language (“it’s my turn now”); parents and families may want names of people, toys and activities, while auxiliaries are often thinking of vocabulary for personal and physical care (“I need to go to the toilet”). A mixture is required. A balance is required too between the vocabulary suggested by the patterns of normal language development, and those items which are meaningful for that particular child.

○ *Use of multiple charts, overlays, devices*

It is unlikely that any one display could possibly contain all of the words and messages a child might need for the whole range of different situations faced throughout the day. Rather than having a sort of ‘lowest common denominator’ sort of display with vocabulary that doesn’t quite match any particular situation, it is preferable to offer a ‘core vocabulary’ chart for basics, plus a whole set of additional different vocabulary

displays (or pages, or overlays and 'themes', on an electronic device) – each one matched precisely to the specific vocabulary requirements of a whole set of different situations and topics, e.g. snack display, news circle display, lunch display, water theme display etc.

○ *Use of simple technology*

At the Nursery and very early Primary stage, trying to use a complex electronic system all the time might 'get in the way' of direct and active communication. Low tech solutions might be more practical. If technology is used at all it is the simple devices, such as the *BIGmack*, that are quick and easy to use and to reprogram that may be most flexible and most effective.

○ *Control of the 'means of production' must be in the classroom*

If symbols of any sort are to be used, it is important that the hardware and software needed to print out symbol labels, charts, overlays for AAC devices, books etc. are in the hands of day to day school staff, so that vocabulary that is needed for specific activities can be produced *immediately* and without fuss as part of normal classroom material preparations. In some schools, this job has been allocated to a particular auxiliary or a speech & language therapy assistant. The more teachers have lessons, materials and required vocabulary thought through well in advance, the easier it is for other staff to prepare symbol materials. If symbol materials are not generated routinely in the classroom, but seen as the responsibility of a 'specialist' who is around less often, the danger is that they simply won't get done in time. Without access to the vocabulary he/she needs, the child will be communicatively passive in the educational activity.

○ *Learning to read and write*

Many children with severe communication difficulties have difficulty with acquiring literacy. Many barriers however can be overcome by early alertness to the need to ensure access to print and literacy activities (using adapted materials if necessary); keeping levels of expectation of success high; ensuring access to a means of communication to ensure active participation in print related activities; providing access to the appropriate vocabulary. The whole language interactive story book reading approach has been found particularly productive, along with integration of literacy related experiences into play and daily living activities.

○ *Classroom based topic specific AAC devices, as well as personal devices*

There is no real reason why a child should be expected to use only *one* communication aid; AAC devices should be 'tools for learning' and a child may use many different ones which happen to match his or her learning needs. If, for some new activity such as a story, it is too difficult or time consuming to programme in specific new vocabulary needed to the child's main personal communication system (and to teach him or her to remember the item, buried in amongst many other vocabulary items), then it makes more sense to simply use another way of accessing the necessary vocabulary, on that occasion. Some of the strategies used successfully include:

- collecting up 'obsolete' technology (no longer needed for a specific child) like *IntroTalkers* and programming these up with the vocabulary needed for particular stories or games, so they can simply be pulled over for use in class at the appropriate moment, rather than having to reprogram the child's own device (with vocabulary which will mostly probably not be needed again anyway).
- programming a repetitive line of a story or rhyme into a simple single message device such as '*BIGmack*' or a cassette tape with a 10 second telephone answering machine loop tape in it.
- using multiple message voice output devices such as *SpeakEasy* or *VoicePal* so that a class group can interact in the same activity, all accessing the same device.
- using voice output devices to 'play' with sounds to instil an awareness of rhymes and alliteration.

This approach is described more fully in Chapter 10 of this book and in a recent CALL Centre video⁸.

○ *School Reading Scheme or Special Materials?*

The advantages of using a standard reading scheme are obvious – the availability of materials (increasingly, including talking computer software), and inclusion with the class group. It will usually be necessary to supplement the reading scheme materials 'sideways' with many other books and materials, as some pupils using AAC may be expected to spend more time at each level than speaking children and may get demotivated by repeated use of the same few books.

Many children, especially those with more complex learning difficulties, will respond better to personalised reading materials made up with photos and pictures of people and places they know, or have themselves

chosen from their communication books. An advantage of this approach – apart from the motivational aspect – may be that the pupil will already have most of the vocabulary they need in their AAC system, and using it for reading has the dual purpose of practising and reinforcing it for communication use (and vice versa).

○ *Writing – Connect to Computer*

Writing is a powerful and potentially motivating part of the literacy experience, but can be a problem for children who cannot use ordinary pencils or keyboards^{9,10}. Assessment for an AAC system should ensure that the device chosen has a printer ‘on-board’ or can be easily connected to a separate printer and/or computer. Many personal communication systems nowadays can be interfaced with a computer so that, as well as being able to key in alphabet letters, every preprogrammed word or message the user selects to say on their system is also displayed in text on a computer screen (and can be printed out from an ordinary word-processor). For children with significant physical problems, this also means that they can use their own switch and scan system to operate the computer, instead of having to waste time and effort mastering another slightly different access system. An alternative will be for AAC device users to also have priority (if not exclusive) access to a computer in the classroom, running the same software as that used by other children, but perhaps with special access technology attached and supportive writing software such as speech output, word banks, predictive typing etc.

○ *Assessment and Recording*

Assessment is ongoing throughout primary school and will yield rich and important information about an AAC user which can be difficult to represent fully through standard reporting procedures, or which may end up locked in confidential medical records. In preparation for the transition to each year’s new teacher, and to secondary school, it can be useful to create a Personal Passport^{11, 12} for an AAC user. This is a means of drawing together all of the key (unique) information about a child and his or her communication system, and presenting it in a simple, attractive and easy to read format which will help new people to understand and get the best out of the child who finds it difficult to ‘speak for him or herself’. Sometimes the process of making a Passport actually helps the professional to observe and understand the child better.

Secondary School Priorities

Leaving primary and starting secondary school can be traumatic for all children, and especially so for some pupils with communication disabilities. They are leaving behind teachers who know them well and for whom all teaching and learning is essentially child-centred, and entering a world where teaching and learning mean the subject, the curriculum, and looming assessment at Standard and Higher grade. Priorities at this stage include:

○ *Early Planning*

In many cases, planning for use of technology for classroom work begins only after the child has been in S1 for a term or so (and may have already started being seen as ‘failing’). This is far too late. Planning should start at the end of P6 / beginning of P7, so that there can be an extended and careful ‘handover’ from Primary, including whatever arrangements are needed for physical access, furniture, and for transfer or purchase of technology.

○ *Reassessment of Technology Needs*

Early planning may include an update of the assessment of need for technology for communication and learning, possibly involving input from a local specialist service or centre such as TASSCC. A child using a ‘silent’ communication system of pictures / symbols or codes, where his/her meaning is co-constructed by familiar people in the classroom, may need to learn to use a voice output communication aid where the role of helpers is reduced and his/her independence increased. It is wise at this stage to borrow new technological equipment for an evaluation period, rather than purchasing anything, until a ‘settling in’ period at the new school establishes whether the equipment meets the new needs, or whether further assessment is required.

○ *Portable Communication / Writing Equipment*

Instead of spending most of the time in one room using a classroom work station computer, in Secondary the children are likely to move around more. A child with writing problems may no longer be able to use a single fixed classroom work station computer for writing tasks but will require a more personal and more portable system.

○ *Personal Support Schemes*

In addition to basic physical care needs, the child using AAC may need additional support from helpers to

manage his/her technology in the new environment. Auxiliaries may be needed to help the child transport and connect up a personal switch access system to a variety of different computers around the school, or to have work printed out on a fixed printer in a 'home base'. The child may need the support of a teacher with computer skills, who can 'trouble shoot' when necessary. This may have staffing cost implications which will need to be signalled early.

○ *Special Timetabling*

Little mention has been made so far of curricular areas and activities such as home economics, music, PE etc. It may not be practicable to expect the child to do absolutely everything that their classmates are doing, in the day, and a specially adapted timetable needs to be devised, allowing time for 1:1 sessions to learn and practice new vocabulary, and to compose writing, if using a slow special access system such as scan and switching.

○ *Creative Human Support*

There are times when the aims of facilitating active independent use of an AAC system – because this may be slow – comes into direct conflict with other educational aims such as 'conveying information', 'presenting sharing and reflecting on ideas, experiences and opinions'. Some teachers and auxiliaries have found that a 'multiple choice' approach, used with high speed eye-pointing codes (e.g. to words on little bits of paper quickly stuck on to the desk, or to imaginary 'compass points' on a wheelchair tray) are the most efficient way for the child to transmit information and to participate actively in class.

Extract from a Personal Passport

My Sight

What can I see?

Practically, I can recognise people that I know when they are a few feet away, but this is mainly from recognising their voice, or because I use 'clues' like the colour of their clothes or the sound of their footsteps. If I hold objects about 5 inches from my right eye I can see them.

My Left

If you come at me from my left side, I will not see you until you are right in front of me.

Even though my left eye has got some sight, I can't see off to my left side, and I might get a fright if you suddenly appear from there

My Right

My sight on the right is much better. So please approach me from my right. It gives me some warning that you are there!

Wearing Glasses

I wear glasses when I'm walking about, doing things, especially outside. I don't wear them inside for reading or for close work.

Most of all, I need **time** to really look at things. How well I use the vision I do have varies quite a lot, depending on how interested I am, or how activity is.

Give me lots of auditory/ verbal clues all the time, and I will 'see' much better!

Field of Vision

I have particular difficulties seeing **downwards**, because the bottom part of my visual field is damaged. I have to move my whole head so that I can always use the top of my vision to look at things. This may account for seemingly 'strange' postures I get into sometimes.

○ *Records of Achievement*

Part of the curriculum for Personal and Social Development includes development of pupils' ability to 'assess their own abilities and capabilities'. The Personal Passport method of collating and presenting information is a useful way of attaining this target, as, for many AAC users, 'standard' record of achievement pro forma are unlikely to be very appropriate.

Sitting Tests and Exams

Later in Secondary school, the issue may arise as to if – or how – a child may be presented for educational assessments and exams, if they use AAC or any form of specialised technology¹³. Basically, for a 5-14 National Test and for ScotVec modules, the child can generally use whatever type of special technique or technology they ordinarily use in class. They may apply for 'alternative methods of assessment' or for 'alternative interpretation of the outcomes', with ScotVec. For Standard and Higher Grades, and Sixth Form Studies an application needs to be made to the Scottish Exam Board (SEB) who will examine each application on a case by case basis and make 'special arrangements' for each pupil/each exam as it considers appropriate. Some awards may be 'endorsed' but research has shown that this is not an issue of concern to Further and Higher educational establishments, or to employers.

The key areas to consider are:

- start early in planning, and in choosing courses and subjects
- make application early for any alternative or special arrangements that might be required
- be aware that it takes time for a pupil to become comfortable and confident with any new technique or technology – they can't be switched at the last moment from their normal classroom method to a special exam method, 'on the day'.

School Leaving

Again, an AAC user is particularly vulnerable when leaving a familiar setting for new situations where nobody knows him or her. An up to date Personal Passport that can go with the young person is the most certain means of ensuring continuity.

There are a few specialist Further Education centres in the UK (only one in Scotland) where AAC users can attend courses specifically to develop their communication skills. A new City and Guilds accredited award bearing course* offering a standardised AAC curriculum, is due to become available to registered colleges in September 1998.

Students who are accepted for higher education establishments will find that in most universities there is now a Coordinator for Students with Disabilities who may be able to help them to acquire special support or equipment that they need in order to complete their course.

For further discussion on any of the topics raised in this overview, readers are advised to contact their local special educational needs and microelectronic service or centre if they have one, and are welcome to contact the CALL Centre.

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* *The Core AAC Curriculum*; contact City & Guilds of London, 1 Giltspur Street, London EC1 9DD for more information.

Augmentative Communication and Literacy – The SAIL Kit Approach

Sally Millar and Jean Kerr

Work at the CALL Centre includes a focus upon the acquisition of literacy (or lack of it) in young children who are non-speaking and who use – or may later use – augmentative communication. CALL's approach is underpinned by the research literature, but for much of the time is essentially practical, in reflection of our own action research findings which indicate the urgent need for practical solutions in classrooms *now*.

The Teaching and Learning of Reading

The teaching and learning of reading has been a highly polemicised epic in the history of education. Battle has raged between proponents of meaning-based whole-language approaches versus those of analytical approaches (and between 'look and say/ sight vocabulary' versus 'phonics' methods). Nowadays, however, there is consensus that literacy involves a complex integration of cultural, social and psychological processes, as well as linguistic and perceptual processes, developing from birth onwards (rather than being a sequence of discrete 'learned' cognitive subskills taught at school). Becoming a skilled reader involves *both* 'top-down' *and* 'bottom-up' processing – in other words, neither an exclusively whole language nor an exclusively phonics approach could be effective – each is necessary but not sufficient. But for AAC users, do we know when, and how, to best teach each method?

For English Language, both the Scottish 5-14 Curriculum Guidelines and the National Curriculum in England and Wales place 'listening' and 'talking' in equally important positions alongside 'reading' and 'writing', helping teachers to a new awareness of the educational value of communication in its widest sense, and to see ways of addressing language and literacy in a more integrated way. Augmentative communication is explicitly included (SOED 1993,14) as a part of the language curriculum for pupils with complex special educational needs. Attainment targets officially permit a variety of access routes such as "voice synthesiser, signing, concept keyboard, scribe" etc. (Part 3 No. 1, 24). Elaborating and adapting the curriculum for pupils who are still working towards Level A programmes of study in 'writing', it is suggested (p.25), may include graphic, interactive, and technology-aided approaches. In England and Wales, the National Literacy Strategy (DoEE 1997) includes the 'The Literacy Hour'. Every Primary class must teach literacy for one hour per day of continuous dedicated time (with scope for adjustment to meet the needs of pupils with special educational needs).

This is a useful background of policy and theory, including a welcome positive emphasis on literacy. In practice, however, the question is begged as to whether we actually know how best to elaborate and differentiate the curriculum to achieve effective literacy instruction for non speaking children who use AAC systems and devices. And where are the materials? (How) can AAC users benefit from The Literacy Hour?

AAC and Literacy

Literacy is a concern for all who work with people with severe speech, language and communication difficulties. The picture often seems rather gloomy. Children who are learning / using AAC often underachieve drastically in the area of literacy. Many adults, even those who are highly competent communicators using an AAC system, are essentially non-reading, lifelong. There is an urgent need for increased awareness, changes in instructional practice, appropriate materials, and more research.

Koppenhaver et al (1991, 1994); Light and colleagues (1993a, 1993b,1994); Smith (1992) and others, have identified numerous factors affecting the acquisition of literacy that are more to do with physical, social and psychological barriers in the environment than with an individual child's linguistic or cognitive factors. For example: the expectations of others – parents, teachers and others; the priorities of others; the quality of literacy-related experiences, pre-school; lack of exposure to print in the environment, due to restricted lifestyle; degree of physical disability (specifically hand function, as it relates to independent access to books and other print artifacts); the pressure of non-educational priorities upon time, such as physical care needs and therapies; poor school attendance due to illnesses; the 'time on task' actually spent on literacy at school; the amount and type of literacy instruction provided; a passive role in communication, and more.

In spite of these barriers, we know that some non-speaking children and adults 'beat the odds' and do become fully literate. How? Why? We need models of how people with severe communication impairments learn literacy. McNaughton (1998) suggests that there has been too much tacit acceptance that poor reading is a deficit within the individual with communication impairment, and too little exploration of effective

This is a revised and updated version of a paper which first appeared in Widening the Perspective (1995)

instructional strategies. We urgently need to know more about what are the best methods of teaching and learning literacy with AAC users. We need to know how best to design, and how to use technology effectively.

And in the Meanwhile –

Meanwhile, there are teachers of non-speaking children ‘out there’ *today*, who need ideas about good working practices and who need appropriate tools and materials in order to put their ideas into practice. Many children with special communication needs are now being educated in their local schools rather than in special educational settings. One of the good things about this is that expectations may be high that the young child with special communication needs will keep up with the work of his/her peers¹. However, many teachers in mainstream have little background in disability in general and no expertise or experience in severe communication impairment and AAC in particular. Speech & language therapists generally have little or no training or expertise in literacy and may see their role exclusively in terms of facilitating functional personal and interactive communication. All professionals suffer from a chronic lack of time to plan and prepare materials, and are in any case often unsure of the best approach to literacy for these children.

Special Access to Interactive Literacy.

CALL has looked at ways of overcoming some of these barriers to literacy and of providing resources of specialist advice, support and materials for the teaching of literacy to children with severe physical and speech impairments. (Barriers also need to be reduced before there can be anything like a ‘level playing field’ upon which to carry out research.) CALL’s approach is sometimes nicknamed **SAIL** – Special Access to Interactive Literacy. **SAIL** includes:

Leaflet for Parents

Communication and emergent literacy start together, at home, long before school age.

In order to encourage awareness of the importance of early attention to print and to reading and writing activities, CALL has produced a leaflet for parents, nursery nurses, and other carers and professionals. The leaflet stresses the importance of assuring:

- the expectation of success, and lots of support
- opportunities for the child to make choices
- access to a means of communication
- the child’s active participation in print related activities

As well as enjoying story reading, some of the most meaningful and motivating emergent literacy activities are everyday activities like watching / helping Mum follow a recipe, look up a phone number, write shopping lists, etc.. Very young children will learn to ‘read’ familiar text like favourite food labels, and shop logos if their attention is drawn to these.

The SAIL Kit

To stimulate teachers’ ideas, CALL put together a ‘kit’ of ‘ready-made’ examples of educational materials for children with special communication needs.

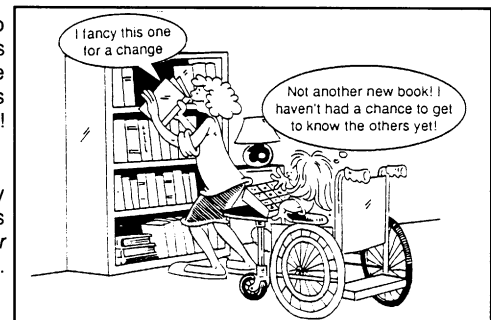
The kit includes:

- Simple materials and games to give print awareness and access to print.
- To supplement the official reader, a range of suitable story books, with interesting stories, clear illustrations, large, simple text, and lots of repetitive lines to stimulate ‘joining in’.
- Adapted books (with page turning aids, for handling by physically disabled children).
- Topic specific low tech communication charts (pictures, symbols, words) to go with the story books.

Who chooses the books you read together?

It’s good for children to make their own choices – and you might be surprised by the books they choose!

All young children enjoy reading the same books over and over and over again....



This helps them to get to know the story and the characters, and gives them confidence. They start to memorise the text, and learn that the words on the page match what the adult is saying.

So next time, let your **child** choose the book.

If the favourite books start to fall apart with constant reading, buy new copies if you can. Then cut the old ones up for games, or to help your child join in and re-tell the story, by pointing the pictures out on a communication chart.

¹Things may go well in primary school, but integration will become much harder at secondary school level. One of the key indicators of success or failure will be the child’s literacy level.

- Ready made overlays for a range of the most commonly used high tech systems, to go with the story books and common rhymes and games used in nursery and early primary classrooms.
- Computer software, with a single page of simple instructions, to allow easy creation of the symbols needed to make such charts and overlays.
- Simple voice output communication aids (VOCAs) to encourage active participation in literacy activities (in many cases already set up with overlays and stored speech sets, to go with the story books), with simple instructions for programming.
- Reading materials for teachers, with further ideas for classroom literacy activities with communication impaired children.
- A range of switches and adapted switches

In-service Training and Loans

CALL offers in-service training sessions to schools to demonstrate these materials and to discuss implementation techniques. We find that once teachers have grasped the principles of the *SAIL* kit, many are themselves rich in implementation ideas. Scottish schools may borrow items from the *SAIL* kit for one term. A short video² has been made, to support loans and in-service sessions. Teachers are more likely to want to borrow parts of the *SAIL* kit, step by step, than the whole thing at once. It often turns out that schools and speech & language therapy departments already have *SAIL* kit type devices sitting unused in a cupboard somewhere. Staff just need to do a bit of 'cupboard scouring' locally and *need to think about using old devices in different ways*.

Active Participation

Emphasis in AAC has been primarily upon the development of functional, interactive communication, in recent years. Although it represents a slight shift of emphasis, work on early literacy development is underpinned by many of the same principles. It is clear that children are unlikely to become skilled readers if they are merely passive spectators while literacy activities are going on around them. In order to participate fully and directly in literacy activities, children with disabilities need *access to print* in a print-rich environment, and they need *access to a means of communication* – low tech or high tech – in conjunction with *communication opportunities*, if necessary structured specially for them by teachers. They also need *motivation* – a belief that they can participate and can succeed.

Appropriate Vocabulary

The AAC system must be adapted to each specific activity, in terms of the vocabulary available. It's no good ensuring that the child has 'a system' in front of them during a story about taking a dog to the vet, if all they can do with it is choose between milk and orange juice! (Apart from being useless for stories and games, inappropriate vocabulary might ultimately cause a child to become altogether demotivated by their system since it becomes hard for them to perceive 'what's in it for them'.)

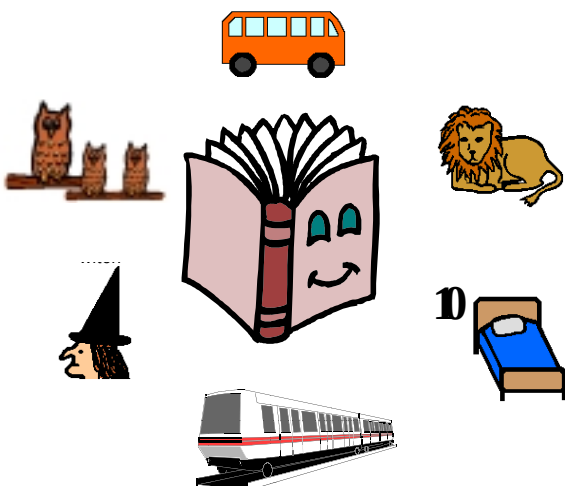
Low Tech

Specific topic linked vocabulary is often best provided through a low tech approach, as illustrated by the *CALL Story Symbol Pack*³. Each of seven specially selected early level story books (c. one line of text per page), has been augmented by an accompanying 8 location colour symbol chart (PCS) which can be photocopied to make additional materials like Snap cards, Lotto games etc. An Apple Mac disk with all the symbols is also available for those with *BoardMaker*.

² A short (c.20 mins.) video entitled "*Special Access to Interactive Literacy*", with short accompanying booklet. The video shows children with severely impaired speech using a range of different symbol based, voice output systems for participation in literacy activities. The commentary explains the principles behind this approach, in simple terms.

³ *CALL Story Symbol Pack* – Seven early level story books (c. one line of text per page), with an accompanying 8 location colour symbol chart/overlay (PCS) to go with each book, large size symbols to fit on top of a Big Mack, record sheets. An Apple Mac disk with all the symbols is also available for those with *BoardMaker*.

CALL Centre Story / Symbol Pack



Use of VOCAs

Voice output communication aids are considered to be motivating and allow children 'to be heard' in classroom groups. However, VOCAs are often under-used in classrooms. Why should this be? Maybe because:

- the device as it stands does not offer the child the vocabulary that is actually required for the curricular activities the group is working on.
- teachers don't have time to program in new vocabulary; set up themes for games or stories; reprogram devices for each new activity; make overlays etc.
- the child doesn't have the time or the spare cognitive energy, to learn, practise and memorise lots of new vocabulary all the time, and to integrate it permanently into his/her personal communication system – vocabulary priorities have to be set (frequency of use for general communication is usually a criterion).
- education staff feel frightened of the device, if they are unsure of how to program it, use it, fix it etc.
- education staff may feel reluctant to alter or add vocabulary to the system, without discussion with speech & language therapists (which may take ages to set up).
- education staff are unsure of how to integrate use of the AAC device into general classroom activities involving speaking pupils.
- they may not be convinced that the child can actually use it effectively.
- the child indeed cannot use it effectively – education staff may be unaware of the amount and type of teaching it takes to develop effective AAC use.

How can these very real difficulties be tackled?

The CALL *SAIL* kit philosophy is based on the principle that to be useful (and used!) in the classroom, VOCAs need to be:

- cheap
- quick and easy to learn, set up, program, and change
- accessible (direct access and switch access)
- versatile
- in some cases, permitting multiple access (for class groups)
- in the *teacher's* 'ownership'

Let's face it – many of the communication aids provided to individual children do not match these criteria...

The Need for Classroom Activity AAC Systems as well as Personal AAC Systems

Children don't always play with the same one toy; it doesn't make sense for them only ever to use the same one communication tool. Let's stop thinking about communication technology as 'going with the child' and start thinking about ways in which communication technology can 'go with the activity'.

We should use the tool best suited to the task, in every given situation. Portable / wheelchair mountable systems like *Cameleon*, *DynaVox*, *DeltaTalker*, to name but a few, are the best tools for personal communication for individual children. Computer work-stations with printers, are the best tools for practising specific discrete tasks and skills, for writing, and for recording work. We're not saying don't use these – of course we want them to be used! But they are not necessarily the best tools for an educational game or activity which is supposed to take about five minutes of classroom time, such as a quick group story telling and interaction session, or a listening and sound-matching game. If they *can't* easily be used, then rather than using nothing, why not use an *additional* VOCA? The best tool for these activities is a device which is quick and easy to set up, and which doesn't have to keep or be put back to their original set of messages. In other words, let's not take communication aids too seriously all the time – let's sometimes go for temporary, *task/topic specific* aids to communication.

With these principles in mind, the *SAIL* kit contains only lower priced items of voice output technology (all under £1,000) that are simple to use. The kit contains:

Single Message Items

- switch adapted loop tape cassette player
- *BIGmack* (5)

Double Message Items

- Two message *Talking Switch* (1)

Multiple Message / Group Access Items

- *SpeakEasy* (1)
- *VoicePal Plus* with taction pads (1)

Multiple Message/ Single user items

- old recycled *IntroTalkers* (2)
- *CheapTalk* (1)
- *MessageMate 20/20* & *Mini MessageMate*
- (*ORAC*, *AlphaTalker* and *TouchTalker* also available, through the main CALL Loan Bank)

The idea is that teachers can use these items in classrooms as 'starter' aids. Or they may use these items in classrooms *alongside* more sophisticated communication aid technology that has already been provided for individual children. We find that teachers are excited by the ideas behind the *SAIL* kit, rather than by the devices as such.

My Old Teddy

The *BIGmack* or similar devices fit this description perfectly. School classrooms often seem to have one each. We recommend that they need a *minimum of two BIGmacks* (to allow for interaction at its most basic level) and preferably several to allow for group use. The *CALL Story Symbol pack* (see above) includes a sheet of colour symbols in a large size to fit on top of a *BIGmack*, for each story, and sheets noting what messages need to be stored in each of three *BIGmacks*, and in an 8 location *VOCA*, if used, so that a classroom assistant can program digitised speech output devices without having to look inside the book to remind herself of the story and without having to think about what to say. We timed it – it takes under two minutes!

As an illustration of the same principle but with a slightly more sophisticated device (but which is quickly reprogrammable via disk drive) CALL developed a dedicated package called '*My Old Teddy*', to allow children to use an *ORAC* to read out loud the Dom Mansell story (publ. Walker Books, 1991), fill in missing words, answer questions, interact, and play an interactive 'hospital game'.⁴

The Role of Graphic Symbols in the Development of Literacy

Research is only just beginning into the important area of the role that graphic representational symbols might play in the acquisition of literacy. Preliminary indications are that a strength of graphic symbols, for literacy, is the area of metalinguistic awareness, especially at the early level of 'print / word awareness' (Bishop et al 1994). Pictures and symbols can also certainly help the child to get meaning from text, which is an important step in motivating further attempts at reading. Some authors feel that the facilitative function of graphic symbols in the acquisition of reading as a whole may have been overstated (Rankin, Harwood, Mirenda 1994). However this should not be taken out of context – the same authors also stress the value of graphic symbols in providing access to a language base, for AAC users

"Once children become competent users of language for multiple purposes, with multiple audiences, whether orally or with graphic symbols, metalinguistic skills more directly tied to reading comprehension can be facilitated"

(Rankin, Harwood, Mirenda 1994 279)

McNaughton (1993) strongly believes that symbols have an important role to play, but that the *type* of symbol used and the *developmental stage* at which they are introduced and used is crucial. She suggests that 'Type One' highly pictographic symbols (e.g. Makaton, Rebus, PCS) may be useful for early language and communication functions. 'Type Two' symbols (eg Bliss) – graphically more removed from their referents – may be relevant for more able children approaching literacy and the higher levels of language processing (but may be rejected if introduced too early.)

The CALL *SAIL* kit approach is to support teachers using symbols from McNaughton's 'Type One' group, in the early stages with younger and developmentally young children, by providing examples of symbol, charts, overlays and sets of individual 'stick-on' symbols to match specific stories and activities. We are now trying to work out guidelines to help teachers to work out *when to move on to the next stage* – to prevent pupils becoming 'stuck' with pictographs when they are actually capable of working with more abstract concepts, more opaque or arbitrary symbols, and indeed words and letters.

⁴The '*My Old Teddy*' package consists of the following: a copy of '*My Old Teddy*' by Dom Mansell (publ. Walker Books, 1991); an application, on disk, for the *ORAC* (digitised and/or DECTalk synthetic speech in 8 and/or 32 locations); a handbook detailing how to use the Teddy application, and how it fits in with the curriculum; a set of overlays for *ORAC* (colour, B&W, blank); a sample concept keyboard overlay (A3).

Software to Generate Symbol Materials

To be practically useful, symbols need to be of good quality, quickly and readily available and easy to produce. Standards and expectations have risen – they need to be available on computer (ideally, with a colour printer). Most symbol systems are now available in some form or another for most types of computer (see Millar & Larcher, 1998, for a comprehensive review). The widest range of choice of software, symbol libraries and pre-stored symbol vocabularies is for PC; the choice is slightly narrower for Apple Mac and Acorn Archimedes. Realistically, most schools will need to use the computers they already have. Schools with Apple Mac computers may find PCS symbols most practical (generated by the Mayer Johnson program *BoardMaker*). Schools that have Acorn Archimedes computers may choose Rebus symbols (with the Widgit programs *Writing with Symbols* and *GridMaker*). All of these and more are also available for PC.

For children using Bliss symbols, software is newly available on PC as well as Apple Mac. We do not usually recommend Bliss as a ‘general’ classroom tool for producing topic specific vocabulary for literacy activities, but recognise that for a few more able young children, Bliss will be the most suitable overall means of communication, in which case it will be appropriate also to use Bliss throughout their literacy programme.

Minspeak icons are not suggested by CALL as the symbols of choice for very young children as a general tool to support classroom literacy activities. They were not designed to be used in this way and work on a different principle. Of course, if individual pupils already have personal communication aids and MAPs which use Minspeak icons, then spending classroom time in learning the icons that correspond with key vocabulary and high frequency function words recurring throughout the literacy programme is important. (Priorities have to be established; transient and context specific ‘fringe’ vocabulary should not be allowed to dominate the child’s communication system – they need ready access to a working ‘core’ vocabulary.)

Symbols for All

One thing is clear. If graphic symbols are used, as with VOCAs, it is vitally important that they are part of the common currency of the classroom and can be used in a common sense way on a day to day basis by the teacher and auxiliaries. It is not helpful for the symbols to be ‘mystified’ into something that only the speech & language therapist can deal with. If the teacher has to apply to the speech & language therapist each time symbol vocabulary is required for a story activity or a game in the classroom, the chances are high that 1) the therapist won’t be available right then and there and delay may occur; 2) the child will be left without an effective means of active communicative participation – yet again a ‘passive spectator’; 3) the teacher will feel ever more alienated from the child’s communication programme and frustrated with the quality of education she is able to provide.

The best practice that CALL has observed is in classrooms where the teacher(s) and therapists jointly plan their language and literacy programme for the term/ week, and determine well in advance, with the auxiliaries, what vocabulary and materials will be required for specific activities. The designated person(s) – often a classroom assistant – can then print out appropriate symbol-based topic charts, overlays, stick-on symbols for books, flash cards, as required.

This approach undoubtedly takes commitment and advance planning – symbol materials cannot be spirited out of nowhere at a moment’s notice. However, the computer tools now available do make it possible to create high quality charts and overlays within, say, ten to twenty minutes. In spite of the work involved, CALL’s experience is that teachers and auxiliary staff feel empowered by being given ‘permission’ (and the technology) to create symbol materials for classroom activities, themselves. They are also much more likely to use such materials with the AAC user if they themselves produced them (rather than being ‘told’ to use something that someone else has produced).

Writing Aids

Writing is not something that follows on, last, after the establishment of reading: listening, talking, reading and writing are held to develop concurrently and to be heavily interrelated. In some cases, it may be easier for disabled children to write independently on computer (by using communication aids connected to computers, special access peripherals and supportive software) than it is for them to speak or read independently, which makes it a particularly important area of literacy activity for AAC users.

Any systems which allow children the motivating and powerfully educational experience of composing text, seeing it written up on a screen for others to read, hearing it build up, sound by sound or word by word, and printing it out, has to be more powerful an aid to literacy than one which simply speaks. Extension of the CALL *SAIL* kit into the full CALL Centre Loan Bank therefore enables schools to borrow devices allowing connection of VOCAS such as the *DeltaTalker* to classroom computers, and a variety of mouse and keyboard

alternatives, and specialised supportive writing software.

Augmentative Communication Systems may Influence the Development of Literacy

With young non-speaking children, it is important to provide voice output technology (classroom devices and personal systems of augmentative communication) as early as possible, to enable active participation and to ensure the development of functional communication for social interaction and for access to learning. However, it should be borne in mind that the nature of the augmentative communication system is itself likely to have an influence on the future development of the child's cognitive and linguistic systems.

Usually, the AAC system chosen is one which 'plays to the strength' of the child. For example, where speech is poor, but vision and comprehension of language are good, a system may be provided that is based on sequences of graphic symbols, with meaningful words, phrases or sentences associated with each. Learning and using this system further develops the child's 'strengths', such as visual skills, memory, and semantic processing. However it may do little to develop the child's already weak areas of auditory processing, sequencing, and phonemic segmentation. In time, for communication, the child may rely entirely upon their compensatory 'strengths' while ignoring other underdeveloped areas of linguistic processing (i.e. employing good 'strategic communicative competence' in Light's terms).

Phonological Awareness and Recoding

At some stage, children have to move from using visual and semantic processing (necessary for decoding the meaning of graphic symbols) to the stage of using auditory and phonological processing. Recent research stresses the importance of syllable segmentation, rhyme recognition; onset-rime; in the early stages of literacy learning, and later of alliteration, analogies, sound-letter matching; sound blending and so on (Goswami 1994).

For children with severely impaired speech, ways need to be found to use AAC equipment to not only transmit meaningful words and messages, but also to allow them to 'play' with sounds and rhymes (as young babies do) to hear sound letter correspondences and to themselves accurately (re)produce sounds and blends (for example, in a 'talking version' of the sort of Phonics worksheets that primary teachers regularly use). An urgent challenge for practitioners is to establish the right balance between using voice output technology to bypass defective speech and speech feedback systems, and using it to develop inner phonological skills.

Grammar

Some children may concentrate on 'key' words and their meanings – in order to communicate basic messages – but have weak grammatical skills. This may show up later as problems in the area of reading comprehension and word order in sentences. Lack of experience with phonemic segmentation may be linked with severe spelling problems. It is quite common to find AAC users who have phenomenal visual memory for written words (learned by a form of 'look and say' method) but who are quite unable to segment even very simple words into their component sounds / phonemes. Luckily, for such people, further forms of AAC may be available to support their writing (such as word banks and predictive typing).

The way that vocabularies in AAC systems are set up can also have an effect. Linguistically, it will be much more valuable if a child can able to fill in the correct one 'missing word' in a sentence at the appropriate time, than it is for them to be able to hit one key that 'spews out' a whole long piece of story text.

Literacy Supporting Features of AAC systems

We are not saying that AAC systems are the *cause* of the above mentioned type of language problem. We are certainly not advocating a return to the 'bad old days' when children were forced to repeatedly 'practise their failures' in speaking and writing and had no access to alternative, compensatory ways of communicating, with all the frustration and denial of potential that entailed. What we are saying is simply that in spite of the early stage of research into AAC and literacy, understanding has nonetheless reached the point where we can say to designers of communication aids, and to those who 'prescribe' and set up particular aids for particular children, something about which features of systems may enhance and facilitate literacy learning in young children, and which features are potentially unhelpful, in the hope that the 'next generation' of systems are even better adapted to literacy teaching and learning.

We believe that literacy learning can be enhanced by AAC systems which offer:

- symbol overlays / displays that include words, not just symbols
- displays that includes well formed and correctly spelled text
- symbol displays on which words can be made larger/ bolder and symbols reduced in size, as the child masters the reading of some words.

- displays where words can replace symbols completely (for those for whom this is an appropriate level of language, there is little point in children learning arbitrary symbols for the 'little words' like 'for'; 'to'; 'and'; 'but' – it's better to go straight to text).
- speech feedback can enhance the development of phonological awareness and phonemic level processing – it should be made easier to programme VOCAs so that alphabet letters, blends and clusters speak their sounds (i.e. not their names or word approximations)
- VOCAs set up to mirror the child's level of language comprehension / production, not to deliver a long piece of text gabbled out by a single key press.
- systems which allow for connection to computer to allow for visual display, editing and printing of text.
- systems that allow for exercises to be set up for the practice of grammar (sentence building) and phonics, as well as for the production of functional / interactive messages.

Teachers will be able to add many more to this list. Teaching programmes will include attention to those areas of linguistic processing necessary for the development of reading and spelling which may be under emphasised by the design of current AAC systems.

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Strategies for Developing Pre-reading Skills for Nursery AAC Users

Lynda Nichol and Caroline Rendle

In August 1994 a new reading scheme, the *Oxford Reading Tree (ORT)*, was introduced at Graysmill School. There was a need to modify the approach to the teaching of reading so that the users of voice output devices could successfully develop reading skills, using the ORT (See Girdler and Frame, 1995).

The resulting background reading led to several important findings regarding the early literacy experiences of pre-school A.A.C. users. It was felt that these issues should be addressed with this population group in Graysmill Nursery if they were to be ready for more formal reading at school age.

Pierce and McWilliams (1993) believe that there is compelling evidence to suggest that parents reading of storybooks to their pre-school children enhances language development and significantly affects reading comprehension in the early school years. However it is the quality of the conversational interactions surrounding this activity which adds to the impact.

Qualitative and quantitative differences in storybook reading interactions

A.A.C. users

v

Non disabled peers

- | | |
|--|--|
| ☐ parents dominate interaction | ☐ child has active role |
| ☐ child seldom fills in line from text | ☐ child pretends to read |
| ☐ few opportunities for participation | ☐ child asks questions re: story |
| ☐ minimal involvement in taking meaning from text | ☐ child talks about story |
| ☐ emphasis placed on physical manipulation e.g. page turning | |

Light et al (1994) highlight in particular the differences in opportunities given to users of A.A.C. in storybook reading situations.

Before beginning to address these differences Light discusses the “contracts of literacy” - i.e. the skills which are established through storybook reading in all pre-school children.

The child should learn to:

- ☐ give attention to books
- ☐ derive meaning from books
- ☐ “talk” about the content of books
- ☐ handle books as objects of thought, not toys
- ☐ follow the topic established through the story
- ☐ interpret the pictures and text as symbolic representations not the real thing

It is also relevant to bear in mind other factors particularly those mentioned in books by educationalists regarding the early literacy development of non-disabled pre-schoolers. Meek (1991) comments that children do intend to make meaning from their very early marks on paper and will read aloud their own messages. Clay (1991) notes that all pre-school children know something about print from their environment. This leads them to form simple hypotheses about letters, words or messages. It is also noted by Beard (1990) that they must show an awareness of how written language functions and that this must be developed before learning to read.

We felt therefore that the expectations placed on able bodied children with regard to literacy development should be born in mind when working with A.A.C. users. However we also needed to teach the A.A.C. users to communicate during literacy experiences and to do so frequently.

Therefore the nursery routine was adapted to allow individual storybook reading sessions for two girls with the teacher or speech and language therapist, which would compliment the existing group story sessions.

This is a revised version of a paper which first appeared in Widening the Perspective (1995)

Storybook Reading Sessions

A selection of books was made using the 5 – 14 Curriculum Guidelines. Books should:

- have a familiar vocabulary
- have an appropriate sentence length
- use predictable and repetitive language
- be at an appropriate developmental level
- reflect different genre of books
- demonstrate alliteration and rhyme
- be appealing

We then needed to adapt the presentation of each book in order to facilitate the child's active involvement in the literacy experience, so that it could be similar to that expected of a non disabled peer.

A variety of strategies were planned based on the findings of the aforementioned articles:

- multiple readings of a small number of books which would gradually enable more active involvement of the child
- the adult would respond to the child's attempts to participate and attribute intention and meaning to them
- use of silent pauses and cloze procedure to provide time and opportunity for the child to participate
- use of low-tech communication to encourage participation by
 - eye pointing
 - frequent yes /no responses
 - symbol topic charts
 - gross actions
- the adult frequently obligate the child's involvement

A deliberate decision not to expect high-tech A.A.C. use in these activities was made. Primarily because neither child was ready but also because "*low-tech systems can offer the user a quick, powerful and highly flexible method of communication*" (Scott, 1994) and this would be less likely to disrupt the flow of the story.

Five books were selected for each child. All the books were popular ones and might be found in environments other than nursery or home. The teacher and the speech and language therapist discussed which modes of communication each child could be expected to use in each of the books. Raygan has dystonic cerebral palsy affecting all four limbs. It was anticipated that she would use verbal *yes/no* signalling, vocalisations, eye pointing and a symbol topic chart to make book choices and to predict outcome. Emma has cerebral palsy with total body involvement and a visual impairment. She was expected to use *yes/no* signalling, symbolic noises, gross gestural movements and eye pointing.

Literacy Related Experiences

Storybook reading sessions are not the only important early literacy experience. Van Kleeck (1990) comments that experience of literacy artifacts e.g. a variety of books, labels, letters, and writing utensils, should be embedded in literacy events taking place in the home environment. She goes on to suggest that to facilitate the foundations for reading, literacy related episodes should be promoted in pretend play i.e. activities of daily living practised in a secure environment.

This made us look carefully at an imaginative play group organised on a weekly basis by the teacher and the speech and language therapist. The group consisted of both non verbal and verbal children all with a physical disability. We decided, as key adults, to introduce informal literacy experiences to this group and to develop these experiences in order to incorporate new ideas weekly. Everyone in the group would be expected to participate in drawing, writing and reading. This would be in addition to the already existing emphasis placed on the use of all modes of communication.

The children had been involved in playing at 'Going on Holiday', so we introduced over a period of time:

- simple travel brochures – consisting of 4 pictures
- envelopes – names and addresses were read and given to correct person
- tickets were written out and received
- money was made – amounts read out

- ice cream cones were made – colours matched flavours
- a pictorial menu was made by the children, which also included written labels and prices
- postcards were received, bought, written and given to friends

Summary

The nursery staff have been aware of the 1:1 storybook reading sessions but have not been specifically involved. An informal discussion has been held to highlight the skills being encouraged, the strategies being used by the adult and the modes of communication the child has been expected to use. A handout has been produced to summarise this information as well as a recording sheet. It is the intention to continue this approach in the next academic year.

The parents have been informed about the early literacy work but not actively involved in it. At this stage we agree with a number of articles which suggest that parent-child storybook reading sessions have a different function.

The development of this project has meant that we have had to rethink and reset the goals for the imaginative play session in order to incorporate the early literacy aims. It is envisaged that much of this initial work should continue in the Class 1 setting in parallel with the development of more formal literacy learning.

Raygan and Emma have each developed preferred story books with preferred people. When these familiar books have been used in group story sessions, the children using non-oral communication are secure in their responses and able to take a more active role.

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Introducing a Reading Scheme to AAC Users

Margaret Girdler and Julie Frame

Recent literature regarding the development of reading in young children has highlighted differences between the early literary experiences of speaking children and those using AAC. One such difference is that the young non-verbal child often has an extremely limited output of vocabulary even if he or she has access to an AAC system. We considered the effect of this on the non-verbal child's ability to learn to read, when we introduced the Oxford Reading Tree scheme to two *TouchTalker* users attending Graysmill School in Edinburgh.

"Until a school system experiences success in teaching reading and spelling to the non-vocal and non-writing, they are often quite reluctant to try. Much needs to be done in educating school personnel about the learning capabilities and communication needs of individuals with severe communication disabilities. Professionals who work in the field of alternative and augmentative communication acquire specialised knowledge of the needs of individuals with severe communication difficulties, but usually are not reading specialists."

Berninger and Gans (1986) p. 62.

The teaching of reading to non-speaking children at Graysmill School has required close liaison between the class teacher and the speech and language therapist. As we read relevant literature, we were alerted to a number of points which we see as important to the teaching of reading to children using augmentative and alternative communication devices. Many of these are relevant to the majority of our pupils at Graysmill who experience delay in language and reading development but the points are particularly relevant to our AAC users.

Light et al. (1994) point out:

- a) "Many children who use AAC fail to develop their literacy skills. Those who do, tend to lag behind their peers". This may result from "limited access to informal literacy experiences and to formal reading and writing instruction".
- b) Teachers need to remain aware of "the 'contracts' of literacy" e.g. "how to derive meaning from books and 'talk' about the contents, how to follow the topic established through the story and interpret the pictures and text of the book as symbolic representations, not the 'real thing'."
- c) "Story reading activities are important particularly to introduce children to the form of reflective thought and decontextualised language which is so much a part of classroom experiences".
- d) "The early literacy experiences of pre-schoolers who use AAC are quantitatively and qualitatively different from those of their non disabled peers", e.g. "they have minimal involvement in taking meaning from the text, never ask questions, seldom talk about the story and seldom fill in lines or words from the text". They also "are involved less frequently in writing and drawing experiences and have less frequent access to printed materials than their non disabled peers".
- e) Children rarely have "access to AAC systems during story reading sessions" and therefore rely on "unaided modes e.g. eye pointing".
- f) Adults tend to dominate the interaction and many children do not "participate actively in story reading even when the book is familiar".

In addition to these important points highlighted by Light et al. (1994), we also felt it vital to bear in mind that:

- g) The non verbal child has an extremely limited output of vocabulary even with an AAC system. In order to expand the single word vocabulary, the child has to have varied opportunities to develop this vocabulary and has to learn and recall the icon sequences for each word. These are two time-consuming extra steps to learning to read.
- h) It is necessary to check and assess text comprehension.

With these key points in mind below are strategies we use at both the pre-reading and early stages of reading:

- a) Joint participation in story reading.
- b) Relate knowledge of world to make sense of stories.
- c) Read a story, talk about the text and relate this to the child's own experiences.

This paper first appeared in Widening the Perspective (1995)

- d) Respond to children's attempts to participate and attribute intention and meaning to these attempts.
- e) Provide opportunities to re-read familiar books frequently and as books become more familiar introduce more complex and more "decontextualised" language.
- f) With familiar books expect the child to take a more active role.
- g) Modify the interaction pattern in order to better facilitate literacy and language development through encouraging the child to take an active role in story reading, ask questions, pretend to read, make comments on the story and rely less on adults' control of process of interpreting the story's meaning.
- h) Be aware of the child's unaided mode of communication e.g. eye pointing
- i) Ask questions frequently so that the child feels obliged to be involved.
- j) Make use of evocative techniques e.g. simple *yes/no* questions, encourage child to predict outcomes and interpret reasons for actions.

Last year Graysmill reviewed the reading schemes in current use and decided to purchase the Oxford Reading Tree (ORT) scheme for use in the lower Primary classes. This scheme uses a 'whole language approach' and a 'story method'. The following quotes from the ORT Teachers Manual tied in with our key points above –

- *"The main reason for adopting this approach and method is the recognition of the importance of story experience for all children".*
- *"Pictures and text work together to give children clues and cues to help them predict the meaning of simple sentences."*
- *"Stories provide a context which lends a purpose to reading."*
- *"As children hear the stories, talk about the text and pictures, and retell the stories themselves, they will gradually match and check what they are hearing and seeing and come to an easy, enjoyable appreciation of what reading is all about."*

The two children described below were introduced to the ORT scheme nine months ago. They both use *TouchTalkers* with a 128 overlay containing the Minspeak Application Programme IEP+. Stuart is a nine year old boy with cerebral palsy. He has no spoken output but uses gestures, facial expressions and vocalisations to communicate. He received his *TouchTalker* in October 1991. Lee-Anne is eight years old and received her *TouchTalker* in March 1992. She has cerebral palsy resulting in spastic quadriplegia and therefore had physical accessing difficulties.

Prior to the introduction of the Oxford Reading Tree work on the children's communication focused on building up their knowledge of vocabulary stored in their *TouchTalkers*. For the most part this was linked to their everyday experiences, encouraging them to use their *TouchTalkers* communicatively through group work and 'fun' tasks e.g. jokes, songs and games. However there was no ongoing direct attempt to co-ordinate their acquisition of vocabulary with their reading.

Stuart's previous reading experience was with the Link-up Reading Scheme. A relatively small number of books were chosen which contained as much IEP+ vocabulary as possible. Along with these books, individual books were made in the classroom, allowing Stuart to revise the sentence structures present in the Link-up books and incorporating this vocabulary into stories relating to himself and familiar situations. Lee-Anne had little reading experience before she was introduced to the ORT. Like Stuart she was given some customised 'reading books' made in school which contained simple sentences relating to her everyday experiences.

Stage 1

We began our work with the ORT by looking at the selection of books available at Stage 1. These early books have no text. The teacher's manual which accompanies the reading scheme states that the aims of Stage 1 are:

- 1 Getting to know the scheme's characters.
- 2 Learning the first key words.
- 3 Developing listening skills.
- 4 Making the link between stories and pictures.
- 5 Encouraging the children to talk about themselves and their experiences in relation to the stories.

We acknowledged that these were important early steps in learning to read and were keen to provide our two AAC users with these opportunities. The names of the ORT's characters were programmed into the

TouchTalkers and group work focused on getting the children to recognise these names and the early key words e.g. 'a' , 'and' and 'the' in the written form.

In order to enable the children to talk about the pictures contained in the Stage 1 storybooks, we looked through a number of the books identifying vocabulary that was necessary for discussions. This proved to be a difficult task as we had no way of anticipating what particular elements of the stories our two different children would want to comment on. However as Light et al (1994) point out in relation to AAC users and early reading "*careful consideration should be given to ensure access to appropriate vocabulary to allow full participation in story reading sessions*". We therefore identified what we considered to be relevant and appropriate vocabulary. Both Lee-Anne and Stuart had individual therapy sessions during which the chosen vocabulary was introduced and practised in a variety of games. The children were then able to participate to a certain extent in the 'story reading' sessions with the Stage 1 books. We felt that anticipating and teaching all the vocabulary that the children may possibly require to comment spontaneously on all of the Stage 1 picture books were impossible tasks. We therefore limited the time spent on Stage 1 and achieved the first four aims listed above. Aim number five is an ongoing aim throughout our work with the ORT.

Stage 2

Our introduction of the books at Stage 2 was by the following 5 steps.

- 1 Selection of books. Whilst the ORT has six Trunk readers we felt the vocabulary contained in them was too extensive. We therefore chose six books with some element of repetition to restrict the amount of new vocabulary to be taught ensuring that the key words identified by ORT were included.
- 2 Compilation of word lists for each book and joint decisions (teacher, speech therapist and sometimes the child) as to the location on the *TouchTalker* of words not contained in IEP+.
- 3 Individual therapy sessions to introduce new vocabulary. A range of games and activities were planned to provide opportunities for practising the learned words.
- 4 Weekly classroom-based group activities with the speech therapist and the class teacher. This provided an opportunity for the link to be made between the newly learned vocabulary and the written word.
- 5 Introduction of a reading book to read and discuss.

As a result of this preparatory work, story sessions were clearly satisfying for the children. They were able to achieve success with their reading and were able to engage in some discussion about the content of the stories.

As Light et al (1994) pointed out "*for story reading sessions to be optimally effective in fostering language and literacy growth, they should allow numerous opportunities for the child to talk about the story and take meaning from the text.*"

We believe we have enabled the children to go some way towards this.

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Leaving School – Crisis or Opportunity

Which is it for AAC Users?

Janet Larcher

Introduction

When young people leave school, typically they are glad to be ‘let out’, looking forward to what they believe will be more freedom, and hoping to move into further or higher education, or into the work place. They see a range of opportunities ahead; a few crises will arise but parents, friends or family acquaintances can usually help solve the problems – or between them they will know someone who can!

Is this the case for young people with severe communication difficulties? I am sure that many of them, like their peers, are keen to leave school. But even if none of the standard sins have been committed – like buying them a new communication aid just before they leave school and not having time to teach them how to use it effectively – who or where do they turn to when they need help because their equipment has broken down, their circumstances have changed, their equipment no longer meets their needs, or they wonder if something new is now available which would make them faster or more efficient communicators? Parents or friends are rarely expert sources of information or help on these issues, and I wonder if school-leavers do know anyone else who can advise them.

Over the seventeen or so years that I’ve worked in this field, although I have worked across the age range – birth to turf as I call it – I have probably spent more time working with adults than with children. Despite knowing how hard the staff work in schools to educate children and to prepare them for the big wide world, I still often wonder what had happened during the school days of the adults that I meet. I also wonder what had happened to the support networks that should have been monitoring them to prevent them from getting into the dire circumstances in which I typically come to meet them.

This is where the title of this conference is so apt – *Widening the Perspective*. Through a chance conversation with someone from a centre with which I had contact very rarely, I found that I was not alone in my musings.

The CENMAC Experience

CENMAC (Centre for Micro-Assisted Communication) is a service which supports the communication needs of children with physical disabilities who are receiving their education in both special and mainstream schools throughout London. All inner London boroughs subscribe to this service and their subscriptions pay for the staffing, buildings, assessments, reviews, equipment loan and maintenance. The service is, therefore, free at the point of delivery, i.e. at the schools, and is therefore used for every child who may benefit from it.

CENMAC staff were increasingly finding that young people whom they had helped while at school were trying to come back to CENMAC after they left school for help and support when equipment broke down or their circumstances changed. Strictly speaking, these young people were now outside their brief. CENMAC wondered how many other young people were out there with equipment that was no longer working or meeting their needs, and whether there was an organisation already in existence to which such young people could be referred. They therefore sent a questionnaire and a letter containing the following section to all clients of CENMAC since its inception in 1958, who had now left school, were now between 19 & 25 years of age, and whose home addresses were available:

“We have been given some funds to find out:–

- i. whether you still have equipment*
- ii. if you do have equipment, whether it is still working*
- iii. if you have received any help or new equipment from any organisation*
- iv. if you need help now to be able to write and/or speak to whoever you wish*

At the moment we do not have enough money to help everyone who might need advice or new equipment. If we can find out how many people need help, however, we may be able to get the funds to start a service for them.”

Of the 135 questionnaires dispatched, 30 were returned, giving a response rate of 22%. Of the responders, twenty-four (80%) were still using equipment and fifteen (50%) asked for help to identify or obtain new equipment.

Some of those reporting that they were using equipment but did not currently need help, described the

This paper first appeared in Widening the Perspective (1995)

considerable difficulties they had experienced in obtaining help with AAC equipment. Others reported that they were currently using equipment on loan from college, the implication being that they will be seeking help to obtain their own equipment as they near the end of their college courses.

Given the nature of the questionnaire and the accompanying letter, it must be recognised that there was a greater incentive to reply for those who currently need help or who anticipate needing help in the near future, and therefore it would be unrealistic to generalise that 50% of those children who had help while at school would still need help in the future. However the 15 of those to whom questionnaires were sent who did request help (11% of the total surveyed) present a very worrying picture – one that certainly points to the need for wider perspectives on the part of all agencies.

Sadly, many of these young people had fallen through all the safety nets established by Education, Health and Social Services. They were largely living at home with at least one of their parents, usually with no additional help, with equipment that was no longer working or crawling along by the skin of its technological teeth. Not surprisingly in the circumstances, ten respondents indicated that they stayed home most days.

Through the stories of D, E and M, three of the young people who responded to the questionnaire, I would like to illustrate, and raise for discussion, many of the issues which I have come to think are crucial in deciding whether leaving school results in crisis or opportunity.

Crisis

While he was at school, D used a unicorn headpointer stick to operate an electronic typewriter and a Memowriter, and to point to a Bliss chart. His spelling was good, he is remembered as having a sunny personality, and he has a loving family. D is, however, one of six children, the youngest of which is only 5 years old and another of whom also has disabilities. On leaving school D was placed in a residential home. Within this setting D was not allowed to drive his powered chair – without consultation with the family it was returned to the wheelchair clinic as being no longer required – no-one had time to communicate with him via his Bliss communication board, and due to lack of physical activity he lost the ability to control the unicorn stick to point to his computer keys, Memowriter and Bliss board. After a year his parents brought him back to the family home while they sought another more suitable residential placement for him and initiated requests that he be re-seated.

Issue 1 – Where should responsibility lie?

Whose responsibility was D's placement on leaving school? Can those who know him and the system so well close the file on him the day he leaves school? How did D end up in such an unsuitable placement? Who chose it and on what basis? Should schools widen their perspective beyond the school gate? Should they check up that all is well for past pupils at 6 months after leaving school – but even if they do this, who should they hand them on to, since social workers in general know little if anything of the possibilities available in the field of technology?

Shortly after D arrived home, the CENMAC questionnaire plopped through the letter box. D's mother did not initially complete the questionnaire, she just immediately phoned asking if we could help D to communicate once more.

When I was introduced to D, no part of him moved, his face and eyes just remained blank. While I chatted to his mother D showed no sign of understanding. I decided, however, to show D a light pointer and how he could use it to point to letters – his mother had mentioned that he hated symbol systems and always wanted to use letters. D watched but his face still remained blank. Having shown him the system and asked if he would like to try it, I received no signals at all. I nonetheless mounted a letterboard on his wheel chair and the lightpen on him. The effect was amazing: he immediately, but very slowly, began moving his head to start spelling out messages. "How much does it cost because Dad is old" was one of the first! His mother, in tears, rushed to get a pencil and paper to write down the letters. After about 30 minutes I had to excuse myself and go – D had not stopped talking. His mother said she hadn't seen him so animated since he had come back home.

Where to go from here? Given that he could use an optical pointer, liked and was good at spelling, he clearly needed a system that could be operated by an infrared pointer and had word prediction to speed up his communication. Another task for Widening Perspectives! I had previously talked to Mardis about such an input for the ORAC communication aid, so I phoned them. We reached the agreement that if I could track down a Photonic Wand (an input device designed for the BBC computer in the early 1980's) they could provide software to make it work the ORAC. The grapevine was activated. Most centres had thrown away their Photonic Wands since they were no longer used, but the CALL Centre had not, and were willing to loan the device. Mardis came up with the software and cable and within three weeks I was back to demonstrate the new device to D. This time he greeted me with a slow, but ultimately very wide, smile.

I had set up both 32- and 64-location Speak and Spell overlays. The 32-location version offered each letter of the alphabet, three prediction keys, Delete, Clear and a Return key which moved D to a second page on which 32 messages could be stored. In fact D had the ability to accurately point to the 64 locations and in fact found this easier to use than the 32-location version. I gave D a couple of messages, but we agreed that D would organise his brothers to record messages for him – he preferred the digitised voice to the synthetic one. When I returned a week later D had a small number of messages recorded by several different people and the tone and person seemed appropriate to each message e.g. “Don’t do that” by his father, “Wait till Mum comes back” by his sister – largely for use with his youngest brother – and a very whining “Muuuum” by a brother for use when he wanted to get around his mother!

D, at his request, has now moved onto a 128-location overlay which does not speak out letter by letter, i.e. he constructs his message and then speaks them out. He now also has about 100 messages in synthetic speech divided between the alphabet and message pages with the letters acting as memory joggers, such as “Arsenal” under A, “Come here please” under C and “Only if I have to” under O.

When D is at home his infrared pointer is attached to a towelling sports head band which he is quite happy to wear. Unfortunately when his hair is freshly washed the head band does not always stay put and requires his mother to adjust it when she passes by or he calls her. Unfortunately this is more of a problem when he goes on respite care. No-one there adjusts the headband until D is very clearly upset about something. D has also had the pointer put onto his headband so that it faces in the opposite direction to the ORAC! When attempting to discuss the situation with staff I was told that there are 72 care staff there and I could not expect them all to know D’s needs! I have also found, when I visited him after 4 weeks at the centre, that he was only using single words rather than the fullish sentences he used immediately and naturally while at home. This resulted in the need to follow up with many yes/no questions. When I asked him why he was only using single words, the speech therapist interjected that nobody had time to wait for whole sentences here, care staff would be gone before D got a whole sentence out! There is now a high probability that D will be offered a permanent place at this home. He likes it there. He has a nice room, activities are organised each day, and it is not far from a small but adequate shopping centre. Several people are in powered chairs but no-one else actually uses a VOCA – although two other residents own them!

Issue 2 – How much do staff need to know?

The staff of this residential centre appear to need to widen their perspective and the training package ‘Attitudes and Strategies Towards AAC: A Training Package for AAC Users and Carers’¹ would be an excellent place to start.

Issue 3 – How much liaison should there be?

D’s new seating mould has now arrived, 9 months after he was measured for it. There has been no mention of getting D independently mobile. D cannot operate the standard powered wheelchair controls. Do we accept this, pressurise the wheelchair clinic, approach other experts in the field, or what? Who within the standard services should be responsible for ensuring that D becomes independently mobile again? (The wheelchair clinic is not, I would suggest, an adequate answer.)

Issue 4 – How much help should be available?

D has never had an environmental control system. With his pattern of cognitive abilities and physical disabilities he clearly needs one. Without such a system he is entirely dependent on others to change the TV channel, operate his compact disc system or turn lights on/off etc. Why has this form of help never been initiated?

Issue 5 – How can independence be supported?

With D’s level of physical disability he is unlikely in the foreseeable future to get a job (although in an ideal world I would not need to think this). He has, however, a very lively mind and might enjoy access to E-mail, Internet and the World Wide Web. Through such means he could interact with others in an entirely independent way. But unless he is given this access soon, he may get out of the habit of writing full sentences and therefore be unsuccessful in establishing and maintaining links through the Web.

Opportunity

In contrast to D’s rather crisis ridden story let us look at someone for whom leaving school has opened a continuous range of opportunities. E lives independently in her own flat just a stone’s throw from a major shopping street. She has an environmental control system and her own van specially adapted to take her powered chair. She has carers of her own age who are with her 24 hours a day. E has a severe physical disability which until now has necessitated her use of head operated switches to control a computer. While

better than nothing, this method of using a computer for word-processing etc. is painfully slow. Fortunately, E's speech is only minimally affected, so with the Dragon Dictate system implemented on a powerful computer she is now able to control the computer by speaking to it. In this way she is able to access all the activities that anyone else can on a computer via a conventional QWERTY keyboard. E is taking courses in a college of further education where she also works training other children and young people with disabilities to use computers. She also acts as a consultant to local employment services. E's new computer system may enable her to increase her work load and become eligible for a grant to purchase equipment from the employment services under the Access to Work scheme.

Issue 6 – Why is there such a difference between the stories of D and E?

Given that both D and E are cognitively able, have sparky personalities, but have severe physical disabilities, why has one experienced crises and the other opportunities? Could it all hinge on the fact that E has easily understandable speech and can therefore maintain her own demand profile whereas D cannot? If this is the reason, then the case is very strong for the development of a knowledgeable service of people who can advocate across a range of issues for people with more severe spoken communication difficulties.

Crisis or Opportunity?

M is severely physically disabled and has no speech. This young man is, however, literate, intellectually very able, and has also shown enormous promise as a composer. He operates a music keyboard with his big toe and can control a computer via a foot switch. He left school with a sophisticated VOCA which was state-of-the-art at that time. Unfortunately, M is also someone whose physical condition has deteriorated, due, according to his mother, to the non-availability of physio- and hydro-therapy now that he has left school. As a result of this deterioration, M can no longer sit in his powered wheelchair on which his CAMPAC communication aid is mounted. He has been supplied with a non-powered chair, but no-one has addressed how he can communicate when in this chair. Since he is a very sociable young man who goes out frequently, this is a major issue. This young man has also shown enormous promise as a composer, and has had a composition played on a television programme. He could not be interviewed, however, due to lack of a communication system. He has no back-up low-tech system: at home the powered chair is kept in the living room at the side of the armchair in which he can be comfortably seated, to allow him to communicate.

The opportunities that have opened up for this young man through the development of his musical abilities were thus being partially thwarted through lack of communication. He was seeing his GP regularly, plus a number of eminent specialists, yet not one of these took a wider perspective on this young man and ensured that he continued to be able to communicate. It is also worth noting that his system had evolved and grown: each alphabet letter had two or three pages of words associated with it, so that each time he sought a word he scanned through an enormous number of words to find the one he was seeking. No-one had reviewed the suitability of the system with him since he left school. Fortunately, M has now upgraded to a Cameleon system using word prediction, which is easily mounted on his wheelchair or removed for use in his home. M changed from one system to the other without any difficulty and now communicates significantly faster. He has made two after-dinner speeches and is currently on a music tour of the eastern seaboard of the USA.

Issue 7 – Breadth of the “Assessment of Need” as specified in the Community Care Act

Is no news good news? M's family knew he had a good communication system but didn't see how it could be used on the new wheelchair. The Social Services who are supplying his carers obviously did a limited assessment of need – it may not have been limited by design: it is more likely to be limited by knowledge, or rather, by the lack of it. Should we be widening the perspectives of Social Services both by telling them what is possible and by offering them a service which scans all their clients for requirements in these areas?

Issue 8 – How can we go forward?

I became involved with D on a purely chance basis. I know many people involved in this and related fields and am aware of much of what is possible. Strictly my remit is to establish or re-establish and maintain communication. This somewhat restricted remit is typical of most of the services working in the disability field.

Issue 8A – Where should responsibility lie for support of the whole person – the overseeing brief?

How can we ensure that D (and others) can experience the full range of opportunities many of which we have identified above? Would a citizen advocate be able to help D to identify and secure the equipment and services he needs? Do such people exist, is this the best solution and if so how do we

create them?²² If not, who should be taking on this role? How can we ensure that D's perspectives are widened and that he and others experience opportunities rather than crises? How can we ensure that another potential crisis already noted on the horizon for D does not occur?

Issue 8B – How can we ensure smooth transitions?

Leaving school has already resulted in one set of crises for D. Would application of the “passport system”²³, which identifies what someone can do, how they do it and who can be talked to if problems arise, have prevented or minimised the crises experienced by D in his first residential placement?

In Conclusion

We must remember that augmentative communication is a very new field, a young science/art form. We have come a long way since 1983 when ISAAC⁴ was first formed. Initially the focus was on the technology, but slowly the perspective has widened as people realised that the technology on its own solved nothing – as fast as it opens one door another hundred doors are presented each hiding their own range of challenges and issues, such as:

- How do we ensure that young children using AAC develop literacy skills?
- Does the use of symbol systems – particularly multi-meaning icons – affect thinking and problem solving skills?
- Can we ensure that people actually receive the equipment which can enable them to communicate most effectively and then obtain the training to ensure that they can use it efficiently?
- How can we increase the awareness of families and carers of how to facilitate the learning and use of AAC systems?
- Are there ways of encouraging AAC users to initiate conversations?
- Are there ways of ensuring that young children never stop initiating conversations?
- How do we raise awareness in everyone of the range of ways in which people communicate other than by speech?
- Can we develop a theoretical model of receptive and expressive language, and cognitive processes, in AAC?
- Do signing systems which support language development and communication within a school environment enable users to survive and grow in the environments beyond school?
- How do we ensure that AAC users have the opportunity to have as wide a perspective as possible on life and maximum autonomy, through independent mobility, environmental controls, education, work, computer access and leisure – games, Internet, E-mail?
- Where, when and how should employment services be integrated into the network? Will the recent amalgamation of the government departments of Education and Employment help with this?

CENMAC did not discover an organisation to whom they could refer past users of their services, so they instigated a new charity MACE (Micro-Assistance in Continuing Education). I am now working for this charity, and my original brief has been broadened to include a whole person approach. We are working towards forming an integrative network which will include employment services, fundraising organisations, and colleges which can provide training in AAC techniques, as well as other assessment and support services.

Technology has opened many doors for many people. By widening our perspectives let us ensure that it continues to hold new doors open and never slams them in anyone's face. Let us ensure that we keep our perspectives as broad as possible at all times, and remember that where people are concerned, the whole can be so much more than just the sum of the parts. And finally let us face up to the issues that this young field of AAC keeps throwing at us thereby ensuring that young people have many more opportunities than crises.

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Adults with Acquired Communication Difficulties and AAC

Lorna McAllister

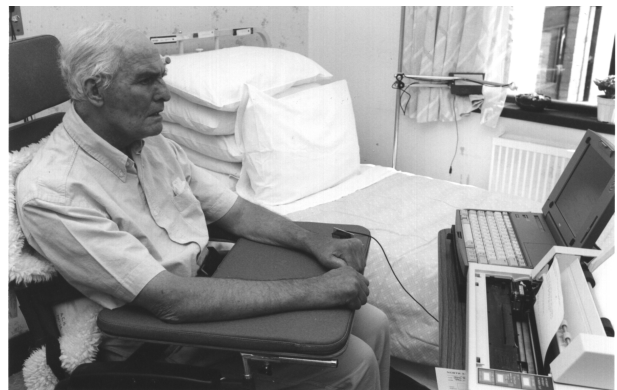
*“For the normal adult who has spoken without difficulty since early childhood the prospect of being unable to communicate is incomprehensible” (Beukelman, D. & Garrett, K. (1988) **Augmentative and Alternative Communication for Adults with Acquired Severe Communication Impairment Augmentative and Alternative Communication 4,2).***

In this paper discussion is focused around a case study. The issues surrounding the AAC management of this particular gentleman, ‘John’, are complex, and represent many of the issues which are pertinent to the implementation of AAC with this client group. This paper summarises the issues in more general terms with particular reference to this case.

John is a 63 year old gentleman who sustained a brain stem infarct which occurred coincidentally with a myocardial infarction in August 1995. John presented with “locked in syndrome” which left him mute due to anarthria, and quadriplegic, but with intact comprehension, literacy and cognitive skills.

John is a retired manager with ICI having worked for the company for 36 years.

During his 5 years of retirement he continued to be active, being involved in the Census and as a courtesy driver of BMWs. John is married with three daughters and his hobbies include all sport, but particularly golf and Rugby Union.



‘What does one say about this machine? It is beyond words!’ – John

Acquired Communication Difficulties

Acquired communication difficulties in adults may be attributable to acquired physical difficulties, language impairment, cognitive impairment or a combination of all three.

The most common acquired neurological disorders which can result in severe communication impairment and which may require a management / therapeutic approach which includes AAC

MEDICAL DIAGNOSIS	COMMUNICATION IMPAIRMENT			VISION PROBLEMS	PHYSICAL DIFFICULTIES			COGNITION
	APHASIA	ANARTHRIA	LITERACY PROBLEMS		Paralysis (including hemiplegia / paresis, quadriplegia / paresis)	Generalised motor weakness	Tremor	
CVA (Cerebral Vascular Accident / Stroke)	●	●	●	●	●			?
Head Injury	●	●	●	●	●			●
Motor Neurone Disease		●				●		
Parkinson's Disease		●				?	●	
Multiple Sclerosis		●		●		●	●	?
Brain Tumor								
Huntington's Chorea		●				●		●
Guillain-Barré Syndrome		●				●		

Relevant Factors when considering AAC

The selection of appropriate systems or techniques for the individual client involves the consideration of AAC options that will meet the individuals *communication needs* and can be managed within the individual's *residual capabilities*.

This paper first appeared in Communication without Speech (1996).



Besides helping me to make my meaning clear, the Lightwriter keeps the brain sharper when making use of the various facilities available.

(Mary, 75 year old lady with Motor Neurone Disease)

A. Communication Needs

Type of message	Who with?	Where?	Type of Feedback
Wants and needs	e.g. 1 – 1 / group	e.g. one room	speech / printed text
e.g. call attention	family	when walking	
emergencies	friends	in wheelchair	Listener response
basic needs	general public	outside	
make requests	preliterate, e.g. children	in bed	
express emotions	hearing? vision?	noisy, quiet	

Information Transfer

e.g. answer Y/N questions

“Wh..” questions

provide unique information

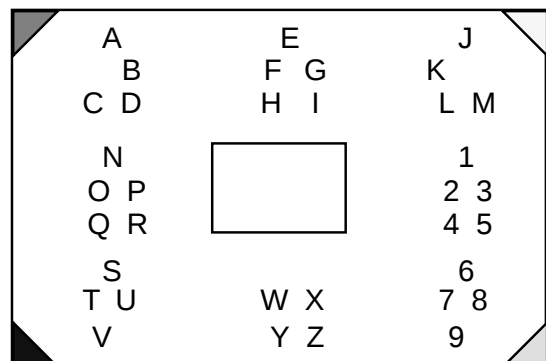
give opinion

Social Greetings, etc.

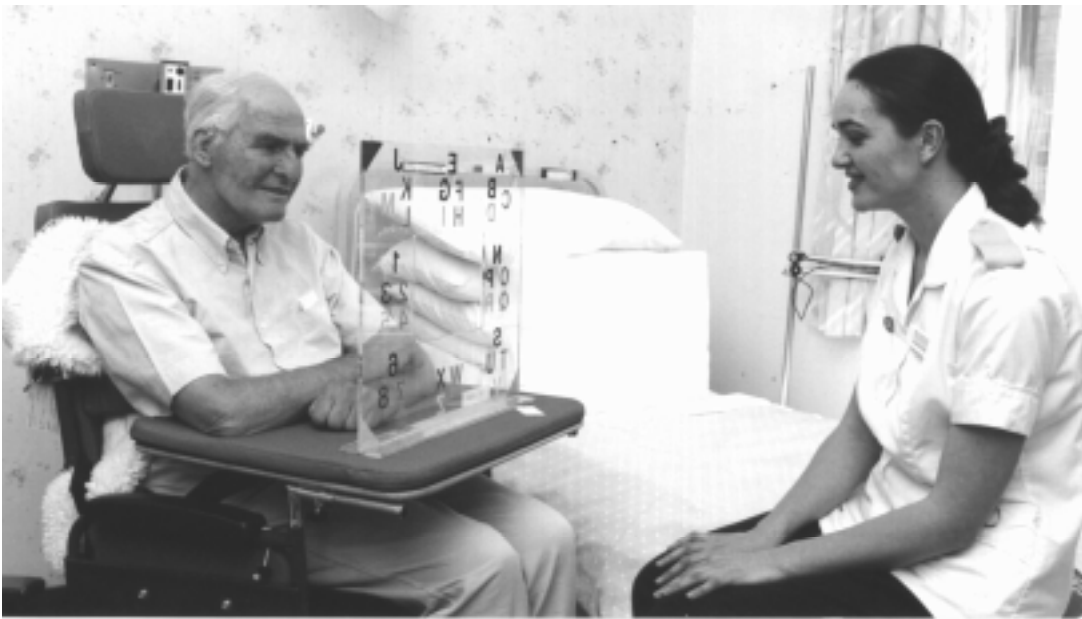
Communication Using the E-Tran Frame

- Place the frame in front of Mr Templeton with the letters facing him
Sit opposite Mr Templeton.
- Mr Templeton will eye point first to one of the four corners (or straight ahead for BLACK) to indicate the colour of the letter he is about to select.
- You should say the colour name aloud for Mr Templeton to confirm by nodding / shaking his head that you have selected the correct colour.
- He will then eye point to the block containing the letter or number he wishes to select.
- Now say the letter aloud for Mr Templeton to confirm.
- Continue in this way building up words.
- Mr Templeton will indicate by eye pointing to the red sticker when he has completed a word.
- It may help to write down the letters.

A.	Colour	B.	Confirm choice
C.	Letter	D.	Confirm choice
E.	Continue		



I find it slow although much better than the board which people have not bothered to learn



..... very frustrating but what does one do? It's the only way to talk.

(John)

B. Residual Abilities

Language / Speech

- e.g. comprehension, including picture recognition / symbolic understanding
 expressive language
 intelligibility
 literacy, including spelling vs. written comprehension
 vision
 hearing
 cognition, including short term / long term memory
 mobility
 physical constraints

Sample of communication chart for Leslie, a 69 year old gentleman with Parkinson's Disease

CARE AND COMFORT

1. Thirsty
2. Temperature
3. Toilet
4. Hygiene
5. Dentures / Glasses



HYGIENE

1. Do you want a bath?
2. Shower?
3. Wash?
4. Shave?
5. Do you need assistance?

The carer must learn to only ask questions to which the reply is only Yes or No. The system being created now enables me to get quickly to my needs in the shortest time possible for both the carer and myself.

(Leslie)

C. AAC System Options

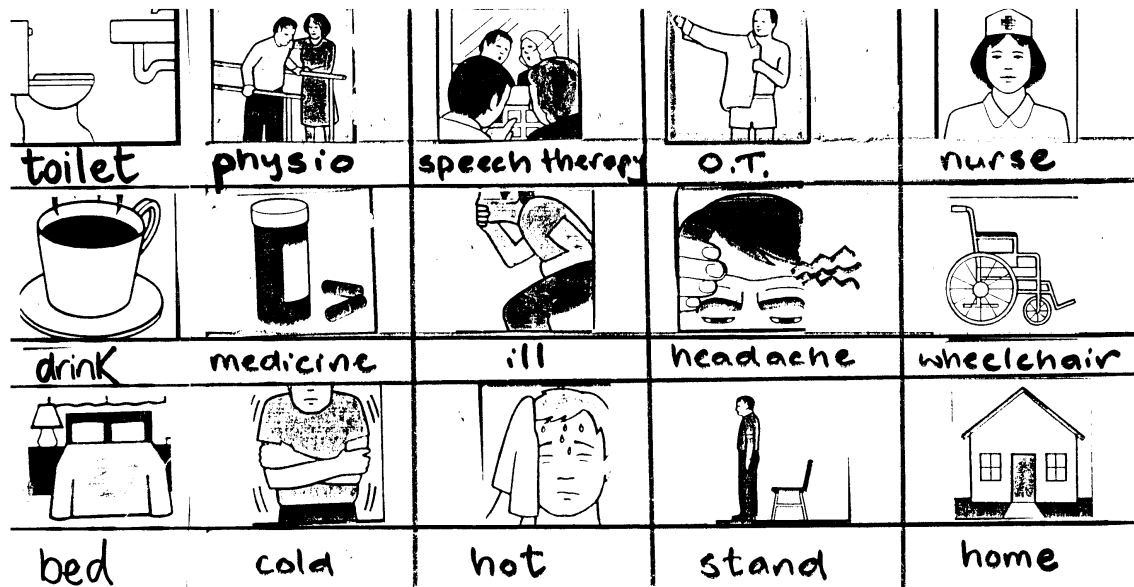
1. Low Tech

- e.g. picture / symbol communication chart
word chart
alphabet chart
pen / paper, etc.

2. High Tech

- e.g. dedicated communication aid
computer based communication system

Picture chart for dysphasic client in hospital setting.



D. AAC System Considerations

Mode of Selection

- Direct
- Indirect
- Listener scanning / feedback

Selection Set

- Symbol
- Icon
- Text

Output

- Visual on screen / printed
- Auditory speech
 - digitised
 - synthetic
 - listener feedback

Portability

Flexibility

User Friendly

Computer Generated Individualised Communication Booklet

My name is **Thomas White**

My friends know me as **Tommy**

I've recently had a stroke and since then I've had difficulty communicating. This booklet will provide information on:-

- : my family, friends, interests, etc.
- : my communication difficulties
- : how to help me communicate

What can go wrong with Tommy's speech



Tommy may be able to choose the word

lappe find the sounds

a-p-p-l-e sequence the sounds in the correct order but..... can find it difficult to instruct the speech muscles to move the correct way. This leads to a struggle to get the sounds out in a word



Tommy may make another word or sound or sometimes absolutely nothing comes out. Tommy may repeat sounds in an attempt to correct the mistake

(For further information on communication books, contact Susan Booth, Department of Speech & Language Therapy, Glasgow Royal Infirmary, 84 Castle Street, Glasgow G4 0SF.)

John and Augmented Communication

By the end of August 1995 John was considered to be medically stable and was referred to Speech and Language Therapy for assessment of comprehension with a view to him using a communication aid.

Several low tech systems were introduced. Vertical eye movements for *Yes/No* responses was established and John demonstrated eye pointing ability identifying objects by name and description. An *E-tran frame* was introduced for spelling through eye pointing.

Further assessment was carried out by SCTCI at the beginning of October 1995 and a high tech option was considered to provide speech output and the potential for printed text. Physically John remained largely quadriplegic although had regained some vertical (nodding) head movement and could activate a *bead switch* with his chin. A *Lightwriter SL80* was provided for trial purposes. However, John found the system slow and being by this time a proficient *E-tran frame* user he preferred this option.

By February 1996 John had regained some use of his left arm and was by now also keen to look again at a high tech system. He was reassessed by SCTCI for a new switch to be used with a laptop computer with *Words+* software, *Equaliser*. He was provided with a mounted switch which he activates with a rotating movement of his wrist. At present John makes full use of this communication system although he prefers to print messages rather than to use the Speech Option.

He remains a wheelchair user and operates the computer either in his hospital room or as set up at home when he goes on a day pass. He is about to be provided with an electric wheelchair operated with a ball / joystick, which should increase his independence.

Plans for the future include:

- i) mounting his communication system on the new chair to allow full use.
- ii) introduce *EZ Keys for Windows* (later, more sophisticated, *Words+* software).

John's discharge home from hospital was scheduled for September 1996.

Lorna McAllister
Speech and Language Therapist
Ayrshire Central Hospital
North Ayrshire and Arran NHS Trust
Irvine
Ayrshire KA12 8SS.

Gerald's Story, So Far

Gerald Masterson

My name is Gerald and I am 29 years old and I have cerebral palsy. When I was born the doctor told my family that I would do nothing in my life. I wish I could meet him. Maybe most disabled people feel the same way. This paper is about my life since I was four to the present day.

My Childhood and School Days

When I was four years old I started nursery in a school for children who have a physical disability. My communication at that time was just pointing to things and some signs. This was slow and frustrating. Maybe if I had had a communication aid things might have been different because I could have told people what I wanted, but who knows! When I was thirteen I had to move in to a children's home and that was frightening because I knew nobody at first, and I had to meet people like the staff and the other children who were there. However, the people were nice and it was easy to join in. It was sad for me at the start because I was used to the love of my family, but I had to try to get on with it, and most of the children would have felt the same way. About that time I also changed schools, and started at Secondary School. This is a big change in people's life, able bodied or disabled, but it was good. I wanted to move there to get O Grades and Scotvec Modules which I did in English, Arithmetic and Modern Studies.

Going to College

I did not know what would happen when I had to leave Secondary School but I decided to move on to College. I did not realise this was the start of many changes in my life. Everything happened so fast. Something new was happening to me every week. I had been using a letter board for my communication, but it was no use in College. I wanted to join in able bodied classes. The first thing I had to do was to see about getting a communication aid. I went to the Scottish Centre of Technology for the Communication Impaired to try different communication aids. I liked the *TouchTalker* and while I was at College I used a *TouchTalker* (bought by the College) and got to know the program *Words Strategy*. It was hard to remember everything and it took me about a year. While I was at College I also did courses in office skills and record keeping.



When I went to College I had to leave the children's home. It was time for me to be doing more things like a normal 20 year old does – to be more independent. I went to stay in a hostel for people with physical disabilities.

Moving into My Own Flat

When I was about to finish College I was asked if I wanted to move into my own flat. I said 'yes' immediately. I asked another man if he wanted to move in with me. He said 'yes' and he was a good help to me. Before I moved in I had to organise help; carers to come in the morning and at night to help me. If I did not have my *TouchTalker* I could not telephone for help and that would have stopped me getting my own flat.

Getting My Own TouchTalker

I love football and I especially like a team called Glasgow Celtic. I have been going to see them for about twelve years and I am in a Supporters Club. The people there are nice and help me to go to see all the games. My friends at the football were happy to see me using the *TouchTalker* for the first time and I told them I only had this *TouchTalker* while I was at College. They were not happy with that and they put on dances, a race night and a disco to get the money for me to have my own *TouchTalker*. They raised the money to buy me a *TouchTalker* in seven weeks! If I had not known them I might have had problems getting that money to buy the *TouchTalker*.

This is a revised version of a paper presented at the 1996 ISAAC Biennial Conference, held in Vancouver, Canada and published in Communication without Speech (1996). It was updated in 1998.

Working

I left College six years ago and I had nothing to do during the day until I was asked to be an Ambassador for Liberator Ltd. The Ambassador job involves talking at colleges and schools and at European Minspeak Conferences. I have spoken at many conferences. I like helping people because I know how hard it is for people who do not have a communication aid. Four years ago I was happy to be asked if I wanted to be a typist in a Housing Association for two days. I worked there coming up for two years. I used my *TouchTalker* to help me use the computer at home and at work. Everyone was nice at work and the only problem was that I used to be spoiled rotten because I was the only man with five women – which I didn't like, well maybe sometimes!

Living My Life

I think this next bit of the paper is, to me, the most important thing which has happened in my life. I know to a lot of able bodied people this is just a thing they do every week, but for me this was big. I wanted to start going out to the pub on Friday and Saturday nights. The first couple of weekends my friend went with me. Now I go by myself by calling a taxi. I have met some nice people who help me get my drinks and still meet new people every week. This is good because I have to tell people what my *TouchTalker* is for. The problem is that most places are not good for wheelchairs to get in, which is bad, but I am used to the places I go to.

I think to myself some nights that I could just sit at home all day and watch TV every day because I am disabled - but what is the point of life doing that? People say I do well because I am able to get out myself, but with my *TouchTalker* and my wheelchair I feel I can be just like an able bodied person.

What Has Happened In The Last Two Years?

During this time I left my work at the Housing Office. This was sad, but the Office was taken over by another agency and some of my workmates left as well. I asked the local Community Service Volunteers to find me voluntary work with disabled kids. They found it hard to get work for me. Then one day I had the idea of asking my old school if I could help out. Every Tuesday morning I help the teacher who is working with four children using AAC. Two boys have *TouchTalkers* with *Language, Learning & Living (LLL)*, one girl has a *DeltaTalker* with *LLL* and one boy has a *LightTalker* with *Reach for the Stars*.

I have also got a *DeltaTalker* now instead of my *TouchTalker*. It is much better. The things I like about it are the icon prediction, the way that I can spell in a word and the *DeltaTalker* will show me the icon sequence (if I've forgotten!), the back-lit screen which makes it easier for people to read my screen in the dark if they can't hear my voice (like in pubs – where it is dark and noisy).

I have also got involved in an Advocacy Group, and we aim to run courses to help people speak up for themselves.

At the moment I am still working in my old school with the children. I would like to expand this work to other schools, etc.. In October 1997 I went on the internet and found this to be a great help to me. It has made me more independent, helped to establish links with professionals and to find many new friends all over the world. I enjoy using the World Wide Web and find it useful for getting information. I have also begun to use Chat to talk to people. Hopefully within the next year I intend to move to a flat on my own.

Gerald Masterson
Glasgow

Changing Attitudes

Kate Ellis

My name is Kate Ellis. I would like to tell you about how I was involved in making videos for a training package, compiled by my speech therapist, Joan Murphy. It was designed to let able bodied people and AAC users understand the difference in communication involving both parties. I felt something had to be done about able bodied people's attitude towards people with speech problems. I feel, because I am in a wheelchair and have a communication difficulty, I get looked upon as being both mentally and physically disabled. I am not. I have a mind of my own. I only wish that people would take the time and realise that I am an adult and I think and feel the same way as they do. I'm not talking just for myself – I am sure many people in the same position as myself have experienced this.

Before moving into my own house I stayed at a hostel in Stirling. I found the attitudes of most staff deplorable. For instance, I like to have my *Liberator* available all the time. I found the staff preferred me not to have it at meal times. They thought as I was eating I wouldn't want to talk, so they removed it. But one advantage I do have is that I can hold a conversation and eat a meal at the same time. I also found that I wasn't meant to answer back as this often offended some people and would affect when I would get my *Liberator*, but half the time I didn't get it anyway because the staff were wanting peace and wouldn't take time to listen to me. I don't think they realized how important my *Liberator* is to me. I put this down to the lack of *knowledge* in the community about how to converse with AAC users. I then asked Joan what she thought and we discussed what would be the best way to go about it. I suggested an in service training day. I then selected members of staff who I felt would benefit most from it. I felt we got the message across at the time but to have a more lasting effect on staff this would have to be done on a more regular basis, to get able bodied people to both understand and listen to AAC users.

... I wasn't meant to answer back as this often offended some people and would affect when I would get my *Liberator*,

Just before I moved into my own house I did another training session at the Speech and Language Therapy Department in Stirling. This involved Joan, myself and my new carers. By this time I found it easier to get the message across. The training video that I was involved in was very helpful because not all my carers had experience with AAC users. The video was able to portray several situations I have so often found myself in like able bodied people talking *about* me and not *to* me when I am present.

In the video it shows I can be more involved in conversation if the company I am in would sit down and were all more or less at eye level. This certainly makes a difference. When you have somebody standing behind you or beside you this can be very intimidating and uncomfortable for the AAC user. Everyone knows their own level of vocabulary, as do I, but I find there is sometimes someone who wants to work my *Liberator* for me. This is my way to converse with people and I don't like anybody else interfering with it, as they could not only make a very costly mistake with it, they could lose me my voice and, because of the position that I am in, I would say it is my most important asset. I am as capable of using my *Liberator* as they are at holding a conversation. The video is very explanatory and I would say in a sense compulsory for able bodied people and AAC users working together.

I also found it very interesting in the training to hear how able bodied people felt about communicating with people like myself. Many feel anxiety and fear. I can understand this but I feel if there was more awareness of this in the community, we would not only be accepted more, but we could also play an active role in educating the public.

I am also involved in helping the Psychology Department at Stirling University with their Research, which I enjoy very much because it gives me a sense of satisfaction. I realise now that there are a great deal of people who are interested in communication. I feel I am more confident within myself now, to start a conversation and to pick up on other conversations. I think being involved in the making of the training package and video, with Joan and everyone else, has helped me.

Kate Ellis
Stirling

This paper was first presented at the 1996 ISAAC Biennial Conference, held in Vancouver, Canada and was published in Communication without Speech (1996).

AAC in the Community – A Personal Viewpoint

Danny McFadden

The role that communication plays in society literally speaks for itself. All we have to do is look back through the decades and see the wars and troubles that have started through lack of communication. If people had talked, how much trouble could have been avoided?

Today we do not have much of a society but without communication it would just not exist at all, or it would at least be a very boring one.

There are lots of different forms of communication. These are talking, writing, telephone, fax, computer modem and now there is AAC.

In this paper I hope to show my respect for the art of communication. This is something that other people take for granted but I certainly do not. One perfect way to realise how important it is to communicate is to put yourself in the situation that you know what you want to say but you cannot speak. You know that all it would take would be a couple of words and the person facing you would understand perfectly what it is you want.

From a little boy my first memory was one of frustration, frustration with not being understood – and, because I was not understood, being treated differently – treated as if I was not intelligent or worse again treated as if I was stupid. If they think you are stupid they can ignore you, and if you make a fuss then they think that you are troublesome and hard to handle. It was humiliating and unless you have been in a similar situation you cannot understand. Asking for something as simple as a drink or wanting to go to the toilet was a challenge in itself. The introduction of communication aids has literally changed my life as I know it has for others.

I think AAC has been of most help to people in care, whether it is temporary or permanent. You have to understand that for the people caring for them it is probably the first time they have met. This is where AAC comes into practice. You can easily let them know what it is you want, they cannot ignore you or pretend they cannot understand you. All it takes now is a simple command on your communicator and you can let them know what it is you want for example, to go to bed, have a drink, you want to go out or simply your food is too hot. The main point being that you become more independent and you develop your self respect again after so many years of silence.

Now the problem develops that you now have hundreds maybe thousands of people with new opinions, new wants, not willing to sit back and accept what goes on around us but stating opinions about respite centres, the carers and the method of care. So now we ask, “are things changing?” Yes, thankfully they are because, to be honest, they *had* to change – and I mean for the better not for the worse.

These things may not seem like much to you, but to me and others like me being able to communicate puts us into society. It lets us have a voice. As people it is our right to use our new found voice or not to use it. We may say things that people do not want to hear.

For me having a *Liberator* has changed my life completely. Not only has it given me a voice (which some may argue is the worst thing that could have happened), but it has also given me the opportunity to write. I can connect my *Liberator* to a computer and write essays, enter competitions or simply play a game.

Looking back through the development of communication aids it really is quite amazing how fast it has developed. First there was Bliss which really was a major breakthrough. From then, it has been advance after advance at a very fast pace. The good thing is that as something new is developed and used we can turn round and suggest how it could be better and the amazing thing is that we are actually listened to, not ignored.

Sometimes I can honestly say that I sit and wonder what the next new innovation will be because truthfully each new communicator that comes out is far more advanced than the previous one. The only sad thing is the expense to buy the next new innovation. This is where I personally believe that the government should help. There is so little help given to disabled people to better themselves or rather no help at all.

To purchase a new communicator takes thousands of pounds. Now how do they honestly expect us to raise that type of money? Maybe they think we can just roll into a bank and ask for a loan but then they know that we could never in a month of Sundays qualify for a loan, so where do we get the money? Again we rely on charity to help us. That may not seem so bad and yes, eventually we get the communicator but how many

This paper first appeared in Widening the Perspective (1995).

people do not have someone that can help them raise the money so instead of getting something which could change their life for the better, they have to do without?

I think at this juncture the government should step in and give help. People who are deaf are given hearing aids. People with heart problems are given pacemakers. People with communication difficulties are given what? Exactly nothing. Again a problem that is ignored. But ignoring the problem does not mean that it will go away. We haven't before and we certainly will not now.

In summary I would just like to say that the *Liberator* has transformed my life from the poor soul that people felt sorry for to the person that people listen to. My only regret is that we did not have the technology years ago.

*Danny McFadden
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