

# Low Tech Methods of Augmentative Communication

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## *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

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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.

## *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*

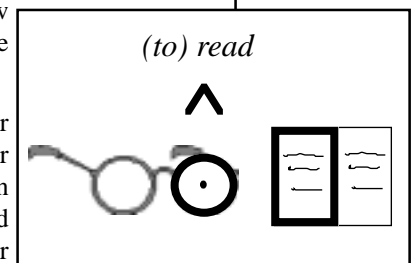
Some people with a communication impairment have difficulty making the representational leap from understanding an object or activity itself to understanding the meaning of a 2 dimensional symbol referring to that activity. They may need to use real objects or parts of objects.

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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