Visual Teaching Strategies for Children with Autism

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Abstract

Visual Teaching Strategies for Children with Autism

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Most traditional teaching methods used in working with autistic children rely heavily on auditory instruction. Autism is a spectrum disorder, with a wide variety of needs and abilities within the range of children with the disability, and not all children within this grouping benefit from copious oral instruction. This paper discusses the type of child that would benefit from an educational approach that emphasizes a visual approach and discusses the benefits and disadvantages of some of the more recognised ones.

Key words: autism, visual teaching strategies, visual learners, TEACCH, PECs

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Autism is seen as a continuum disorder, with vast differences between the individuals affected [Wing, 1979 #835]. A brief review of current literature shows the tremendous variety in both philosophies as well as programmes to meet the educational needs of these individuals. See for example Rutter, Schopler et al. 1978; Howlin and Rutter 1987; McEachin, Smith et al. 1993; Siegel 1996; Howlin 1997a; Mesibov 1999) Yet the success of most of these approaches is limited, (Quill 1997) with a call for additional research consistent among them all.

The difficulty comes in addressing the requirements of that proportion of the autistic population whose needs are not met in traditional classroom approaches. In this paper, traditional classroom teaching approaches are defined as spoken teacher instruction directing child activity. For the portion of the autistic population addressed in this paper, spoken instructions and directions that occur in traditionally taught classrooms do not typically have the associated receptive meaning. Consequently, these instructions are 'lost' and the child can miss the learning opportunity. Peeters (1997) refers to this group as '*dyssymbolic* with regards to what they hear: they have specific difficulties analysing the meaning of abstract auditory information.' (p. 72)

Visual Learners

Although a child may have difficulty associating meaning with verbal instructions, this is not necessarily true of instructions that take a more visual form. These are generally two-dimensional (i.e. written words, icons or

pictures) but can also be three-dimensional (i.e. gestures, expressions). For the purpose of this paper, I will refer to this subgroup as visual learners. Visual learners are children that process and retain information better if it is presented in a format where it is written down and can be seen, as opposed to information that is primarily heard. It is this particular subgroup of autistic individuals that is the focus of this paper.

Grandin (1995), an autistic author, describes what it is like to be a visual learner. 'I think in pictures. Words are like a second language to me. I translate both spoken and written words into full-color movies, complete with sound, which run like a VCR tape in my head. When somebody speaks to me, his words are instantly translated into pictures.' (p. 19)

Although Dr. Grandin describes being a visual learner as a 'tremendous advantage' (1995 p. 19) this is not necessarily true of all autistic individuals. The lack of the natural ability to derive meaning from spoken words often results in autistic children that have no, or severely limited, spoken language. Siegel (1996) states 'With autistic and PDD children in particular, the *language channel* is often the weakest. This is often the case with children who seem able to tune out much of the language addressed to them, and do not easily learn new words just by hearing other people use them.' (p. 242-243)

The balance of research evidence and practical experience suggest that spoken language is not registering much, if any, meaning for this subgroup of autistic children. It is therefore important to look at other ways to encourage the exchange of meaningful information. (Quill 1985; Siegel 1996; Peeters 1997; Quill 1998)

Visual Strategies

One approach is through the use of visual strategies. These are defined as two-dimensional or three-dimensional representations of a particular concept used to communicate and teach that idea or concept. These can take the form of pictures, icons (black and white cartoon like images), photographs or gestures to enhance the understanding of spoken word/s communicating an idea. The use of visual systems can strengthen the child's understanding of the communication in his or her environment (Peeters 1997; Quill 1997).

> 'Using visual environmental supports to mediate communication interactions and support understanding provides a nontransient foundation essential for more effective communication. It builds on children's strengths rather than placing more demands on their area of greatest difficulty. When visual supports are used to give these children information and direction, child comprehension increases significantly.' (Hodgdon 1995b p. 268)

It is important to remember the following points about visual strategies:

- Visual strategies do not exclude vocal exchange. The limited use of key words is frequently used to try and reinforce the receptive meaning of spoken words.
- Visual strategies should be viewed as a temporary support mechanism for communication and reduced when appropriate to the individual.

- The goal of visual strategies is to enhance the meaning of communication for the child. No one particular approach is right for every child in this subgroup and alternative types of visual strategies may need to be tried before a 'best' approach is discovered for any one individual child.

Kathleen Quill (Quill 1995; Quill 1997; Quill 1998), identifies specific cognitive difficulties in children with autism that make the use of visual systems preferable. She feels that autistic children have difficulties shifting attention. This makes it hard for them to follow a normally changing conversation or obtain meaning from social events. In addition their 'cognitive deficits entail a constrained ability to analyze and integrate information cohesively and flexibly. …they are left with a series of fragmented experiences…' (1997 p.699) Lastly, their ability to remember nonverbal material is better than verbal material. These three combine to make the use of visual systems preferable.

Peeters (1997) highlights 9 reasons why a visual system can compensate for an ineffective verbal system. (See Figure 1)

-Insert Figure 1 about here-

Hodgdon (1999) concludes that students on the autistic spectrum don't understand their world very well. 'They tend to be visual learners living in a very auditory world.' (p. 65) The use of visual strategies can help rectify the situation and make better sense of the world around them for these children.

Communication

Before considering some of the various types of visual approaches and relevant literature, it is important to discuss the concept of communication. It is essential to note that because a particular child does not use spoken language or visual strategies, it does not necessarily follow that they are not communicating (Howlin 1998).

Although Webster's Reference Library Concise Edition, English Dictionary define communication as 'to impart, to share; to succeed in conveying information…', others use a broader definition. Layton and Watson's (1995) definition of communication is particularly descriptive. They state that it is the ability to let someone else know your needs and desires, verbally or nonverbally. (Layton and Watson 1995) This is critical to understanding the subgroup for discussion in this pilot, as Schreibman (1988) states that 50% of autistic children are functionally mute. (p. 106) Bondy and Frost (1995) estimate this number to be as high as 80% (p. 322).

Just as society can communicate the need for motorists to slow down on a particular stretch of motorway by posting a police officer with a speed gun and infants can communicate that they wish to be picked up by outstretched arms, non-speaking autistic individuals also communicate without the use of spoken words. 'Most communicate a great deal, although how they attempt to communicate may not always be socially desirable, and what they are attempting to communicate may prove difficult to establish' (Howlin 1998 p. 107). This can

lead to a very ineffective communication system from the point of view of the child, which many believe is demonstrated by antisocial behaviour.

Some researchers have proposed a link between the inability of an autistic individual's ability to express his or her needs or wants, or understand when others express their needs or wants, and disruptive behaviour. The most frequently cited example of this in the literature is aggression. (See for example Schopler and Mesibov 1994; Koegel and Koegel 1995; Layton and Watson 1995; Hodgdon 1995b; Howlin and SCOPE (Great Britain) 1998) Cohen (1997) states that a 'lack of an effective communication system is associated with increased tantrums, aggression, and even self-injury.' (p. 109). Hodgdon (Quill 1995; Hodgdon 1995a; Hodgdon 1995b; Quill 1998; Hodgdon 1999) states that the lack of an effective communication system is one of the fundamental deficits in children with autism and that often leads to behavioural problems. 'As more is learned about autism, it appears that challenging behavior may… [be] a result of certain other characteristics: difficulty establishing and maintaining attention, interpreting verbal communication, and developing skills such as sequencing and organization.' (p. 265) Hodgdon (1999) summarises this concept nicely when she states, '…communication difficulties can be a *primary* reason for many behavior problems.' (p. 26)

The proposed link by the researchers listed above between the lack of communication and aggressive incidents is an interesting one. It makes the assumption that the individual autistic child is consciously attempting to

communicate and therefore purposefully exhibiting antisocial behaviours. It also assumes the individual autistic child understands the concepts of cause and effect and the aggressive act is a frustrated response due to the child's inability to access the desired entity by their purposeful attempts to communicate. Thirdly, it also assumes that the individual autistic child understands the mental state of others, and can therefore direct the activity of another individual based on their own actions (Theory of Mind). This assumption is frequently debated among researchers, most notably by the writings of Baron-Cohen (see for example Baron-Cohen, Leslie et al. 1985; Baron-Cohen, Tager-Flusberg et al. 1993; Baron-Cohen 1995; Carruthers and Smith 1996; Hadwin, Baron-Cohen et al. 1997; Mitchell 1997; Baron-Cohen, Tager-Flusberg et al. 1999; Howlin, Baron-Cohen et al. 1999b).

Types of Visual Strategies

There are two major groups of visual strategies: those that rely primarily on movement or gesture (Sign Language) and those that involve external materials (PECs-Picture Exchange Communication System, TEACCH-Treatment and Education of Autistic and related Communication handicapped Children or Nina Lovaas' Reading and Writing Programme). This section will briefly describe four visual systems (See Figure 2) and then compare the attributes of each. It is important to note that each system has its proponents and opponents. It is not the purpose of this paper to engage in an in-depth discussion on the arguments involved in this debate, but to briefly describe each system. (See for example Bonvillian, Nelson et al. 1981;

Donnellan 1985; Matson, Benavidez et al. 1996; Mesibov 1997; Howlin 1997a; Bondy and Frost 1998; Jordan, Jones et al. 1998; Lovaas and Lovaas 1999-prepublication copy; Lovaas 2000).

-Insert Figure 2 about here-

Movement Based Systems

Most of the literature around the use of sign language to help children with autism dates from 1970's and 1980's (Kiernan, Reid et al. 1982). Research based in the United States, saw it was primarily as a way to encourage speech in children that did not have spoken language (See for example Fulwiler and Fouts 1976; Benaroya, Wesley et al. 1977; Salvin, Routh et al. 1977; Carr 1979; Bonvillian, Nelson et al. 1981; Kiernan, Reid et al. 1982; Yoder and Layton 1988)

The UK system of Makaton was initially used to address the needs of hearing impaired. It is now used in special educational classrooms as a means to improve communication in learning disabled children, as well as autistic children. (Walker www.makaton.org/) Makaton is a series of hand movements (which are sometimes represented as icons as well), each depicting a concept or idea. The communicating partner makes these hand movements when expressing ideas or concepts to the child. The child can also make them to respond.

In addition to sign language, gestures and expressions are also frequently used when communicating. This can vary from pointing a finger to a critical

item (i.e. pointing to a chair when wishing the child to sit down) or a facial expression to indicate a concept (i.e. smile, to show that the communicating partner was pleased with the work of the child).

Materials Based Systems

Three materials based systems are TEACCH, Nina Lovaas' Reading and Writing system, and PECs (or other icon based systems).

TEACCH is based on the work of Eric Schopler at the University of North Carolina, Chapel Hill. It is a state wide programme designed to meet the needs of autistic individuals throughout their lifetime. It is built on the premise of adapting the environment to accommodate the deficits of the child. It structures the child's world through the use of pictorial schedules to visually represent events in the child's day or steps necessary to complete a task. It also alters the child's space by having specific areas of the classroom for specific tasks (i.e. workstations for individual work, areas designated for group activities). (Schopler, Reichler et al. 1976; Schopler, Mesibov et al. 1985; Schopler and Mesibov 1988; Schopler and Mesibov 1994; Schopler and Mesibov 1995; Mesibov, Adams et al. 1997; Mesibov 2000)

Nina Lovaas' Reading and Writing programme also uses written pictures to communicate with children. In addition, it teaches the child to read words by matching these with the pictures. It does this both receptively and expressively and then eventually leads to having the child write (or type) as a

means of communicating their thoughts. (Lovaas and Lovaas 1999-prepublication copy)

The last of the materials based systems is PECs. Picture Exchange Communication system (PECs) was designed by Lori Frost and Andrew Bondy as a system using small cards to represent items the child wanted (favoured toys or food items). The child is encouraged to take the card to the communication partner as a way of requesting the item. The adult gives the item to the child in exchange for the card. Once the child understands how to access desired items, the system is used to teach concepts or other abstract ideas. (Bondy and Frost 1994; Bondy and Frost 1995; Bondy and Frost 1998).

Each of these systems discussed above is broadly based on behavioural theory, pairing the successful completion of a task with something that is desirable by the child. The use of socially acceptable reinforcement after a completed task is believed to increase the likelihood of the task being completed successfully again. (Romanczyk 1996)

The value of social reinforcement in regards to autistic individuals is a topic that has generated some debate. Briefly, it centres on the value of social reinforcement for children afflicted by an ailment that are distinguished by deficits in social awareness. It must be kept in mind that autism is a spectrum disorder, and that individuals affected have variation in both the

degree and specific discrepancies within the Triad of Impairments (Wing and Wing 1976). It is beyond the scope of this paper to go into an in depth discussion on this topic, but would refer the reader to some of the works by Jordan or Howlin (Howlin 1997a; Jordan, Jones et al. 1998; Jordan and Jones 1999)

Visual Systems Compared

Each of the systems listed above has advantages and disadvantages and these must be matched with the strengths and needs of any individual child. It is helpful when comparing them in reference to an individual child, to investigate the following points:

- Primary purpose-All children need to have their educational as well as basic needs met, but does the particular child have stronger needs in one or the other?
- Responsibility of the main communication partners-Does the system selected assume that others also understand it? If sign language is chosen, do close family members understand it or are willing to learn it?
- Generalisation-Can the chosen system 'grow' with the child as they begin to become competent in it?
- Independence-How practical is the system in the community? Is the child likely to be in an environment where they are dependant on others to understand this system?
- Self-stimulatory behaviour-Some of the materials based systems are Velcro based which can be an issue if the child likes to flick or flap items.

Sign based systems may also be problematic if the child frequently uses his or her hands inappropriately.

- Preparatory work-This varies quite a bit between systems. Some of the materials based systems are dependent on others continually making new materials. Signing systems need others willing to learn how to sign.
- Expense-In addition to keeping current with new icons, materials can become worn which will add to the overall cost of materials based systems. Training in all visual systems is also a cost factor.

These factors are used to compare the visual systems in Figure 3.

-Insert Figure 3 about here-

Conclusion

Traditional teaching methods rely heavily on spoken instruction. Although this type of instruction may be helpful for some children on the autistic spectrum, it is not helpful for all. A subgroup exists which does not easily associate meaning with spoken language and therefore may fail to notice opportunities for learning in this type of environment. This can lead to a failure to communicate or understand language, which have also been linked to an increase in behavioural episodes. This subgroup is known as visual learners.

An alternative to traditional teaching approaches can be found in employing visual teaching strategies. The use of either movement based or materials based systems can (when paired with limited spoken language) help break

this barrier and allow this subgroup to gain communications skills by channelling instruction through visual means.

Although several systems exist, each has its relative merits. It is important to match these with an individual child when choosing a visual system.

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Visual Systems and Autistic Children
1. Makes abstract concepts more concrete. 2. Communicates things that cannot otherwise be understood. 3. Helps individuals cope and prepare for changes. 4. Increase independence. 5. Reduces failures and behavioural problems. 6. Reduces stereotyped behaviours and therefore increases socialisation. 7. Reduces dependency on specific primary care individuals and decreases anxiety when staff or environmental changes occur. 8. Helps autistic individuals understand and manage the concept of time. 9. Reduces passivity.

Figure 2.1 Summarized from (Peeters 1997 p. 78)

Movement based:	**Materials based:**
Sign Language Gestures Facial Expressions	Reading and Writing Programme TEACCH PECs (Symbol Systems)

Figure 2 Visual Systems

	Visual System			
	Sign Language	Reading and Writing Program	Symbol system	TEACCH
Initial primary purpose	Communication	Educational	To get primary needs met	Educational
Fine motor skills of the child	Fine motor dexterity necessary	Minor amount needed	Minor amount needed	Minor amount needed
Responsibility of main communication partners (CP)	-Must be knowledgeable of sign system -and often child's 'own' signs -Need to be attentive to any communication attempts by child	-Create and maintain repertoire of words -Must be literate	Create and maintain repertoire of symbols	-Create and maintain repertoire of symbols or pictures -Adaptation of environment
Generalisation	-With other signing partners using the same sign system	-Can be slowed down due to grammar rules -Can lead to writing or typing	-Dependant on access to symbols -Symbol can be too general (General Crisp symbol versus Hula Hoops symbol) for advanced work	-Environmental adaptations can restrict generalisation -Structures can be generalised to new settings
Independence	-Difficult with general public -Not dependant on access to external materials	-Easily understood by general public -In some stages, dependent on access to external materials	-Easily understood by general public -Can be too general -Dependent on access to external materials	-Set routines can increase independence -Child can become dependant on routines
Self stimulatory behaviour	-Interferes with some signs	-Materials need to be adapted	-Materials need to be adapted	-Materials need to be adapted -Environmental adaptations?
Preparatory work	-Training	-Training -Make materials	-Training -Make materials	-Training -Make materials
Expense	Communication Partner (CP) training -Manuals	-CP training -Manuals -Ongoing materials to create and replace cards (Velcro/laminating paper)	-CP training -Manuals -Ongoing materials to create and replace cards/book (Velcro/ laminating paper)	-CP training -Manuals -Ongoing materials to create and replace cards (Velcro/laminating paper)

Figure 3 Visual Systems Compared