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Sutherland House School
Voice Output Communication Aid
Research Project

How does access to a computer based voice output communication aid (VOCA) system change the language and communication of children with both autism and severe expressive language disorder in class curricular activities?

Intervention Working Paper

Rebecca Checkley

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NORSACA

NORSACA is a regional charity working with people affected by autism. NORSACA operates from several sites in Nottinghamshire and Derbyshire. Our services also extend to adjacent counties where appropriate. We offer diagnosis and assessment of children; family support; a post-16 college; residential, day and outreach services for adults; publications, training, seminars and conferences for parents, carers and professionals.

For further information on NORSACA and Sutherland House School please visit our website: www.norsaca.org.uk

Sutherland House School

Sutherland House School is a non maintained special school run by NORSACA. It provides day education for up to 94 pupils with autism, aged 3 to 19 years. It operates from five sites in and around Nottingham. Pupils come from a wide catchment area, including the counties of Nottinghamshire, Derbyshire, Lincolnshire, Leicestershire and Rutland.

The school provides each pupil with a programme of learning which is tailored to his/her individual needs. There is a strong emphasis on developing language and communication, and the personal and social skills which will help pupils to achieve the highest level of independence possible.

The school was given an overall rating of 'outstanding' when last inspected by Ofsted in October 2007. From September 2008, the school will have Specialist School Status with a specialism in Communication and Interaction.

Sheffield Hallam University

The Autism Centre is based within the Division of Education and Humanities, Faculty of Development and Society, at Sheffield Hallam University. The Centre is an evolving and developing organisation dedicated to enabling people with autistic spectrum disorders, parents, families and professionals to access information about the autistic spectrum. The Autism Centre provides a programme of workshops, talks and lectures for professionals and families; research into all aspects of autism; accredited courses; papers and publications.

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Research project to evaluate the impact of access to high tech voice output communication aids on the language and communication of children with autism.

**Intervention working paper
Rebecca Checkley**

This working paper introduces an AAC intervention for children with autism, which will be evaluated as part of a research project developed at Sutherland House School in collaboration with Sheffield Hallam University. The project will run from September 08- April 09. The research team includes Rebecca Checkley (Sutherland House, SLT) and Dr Nick Hodge, Sue Chantler and Dr Lisa Reidy from Sheffield Hallam Autism Centre. The main research question is; *How does access to a computer based voice output communication aid (VOCA) system change the language and communication of children with both autism and severe expressive language disorder in class curricular activities?*

This is a practice-based research study which aims to explore in depth whether low cost, computer based voice output communication aids can help children with autism who are non-verbal or who have severe expressive disorders, to communicate.

This paper is one of two working papers written to allow multidisciplinary and critical review of our proposed intervention and evaluation. Practitioners' responses to these will be used to refine the research.

This "Intervention working paper" introduces an outline of the proposed intervention and summarises its rationale; listing the principles on which the intervention is based.

1. Outline of intervention.

In this research we use ordinary laptops to create low cost voice output communication aids (VOCAs). We run a vocabulary package (Ingfield Dynamic Vocabulary) and communication software (Grid2), to give children independent access to a wide and personalised vocabulary.

Three children aged 12 from different classes, with severe receptive and expressive language disorder and autism will be included.

The children will be accessing computer voice output communication aids in 3 contexts, but our main research interest is the impact that this has on their communication in class lessons.

1. The children will attend a weekly AAC users' skill development group throughout the project period. This will be led by the Speech Therapist. Everyone in the group will be using communication software within a total communication environment which accepts and encourages all modes of

communication. Software communication pages will be displayed on the whiteboard throughout the activities.

Every child will have a designated, skilled, adult “communication partner”, who will scaffold the child’s communication development through the aid. “Scaffolding” will include having conversations with the child about words and activities, using the aid. Communication partners and children will solve the communication challenges presented by the group activities, together.

The principle aim of the group will be that children are communicating and sustaining communication in motivating, fun, shared activities. The process of communication rather than functional or language outcomes will be prioritised. The sessions will be planned to reflect children’s interests and their choices will influence the sessions.

Activities will aim to build their conceptual understanding, encourage communication for a range of purposes and support language progression. Receptive and expressive skills will be considered. Emotional and self expression will be practised.

The children will be using a variety of resources, including whiteboard activities, story books, boxed games, comics, DVDs, puppets, pictures, and photos.

2. The children will have regular 1;1 sessions with their communication partner in which they use their computer VOCA. These sessions will follow the child’s agenda and the aid will be personalised for them, e.g. to include a vocabulary of self expression and their favourite images and themes.

3. The computer will be introduced into a class curricular lesson and the child will be supported by their communication partner to use it. The child’s communication partner, class teacher and the speech therapist will plan together to create opportunities for the child’s participation and communication in the lesson.

In addition, children may take their computers home, at parents’ request. We recognise the importance of families in AAC development, but in the current project, home use is not part of the research intervention.

2. Rationale for intervention

Aim of intervention

We aim to give 3 children with autism their best chance of benefiting from access to a computer based VOCA by incorporating best practice from the fields of AAC and autism.

In this paper, when reference is made to using a common mode of AAC, it means that the child and their partners are using the VOCAs. However, “total communication” or “multimodal communication” is a fundamental of AAC intervention (Blackstone et al 2007, Hazel & Larcher 2005, Light & Drager 2007). This intervention assumes that VOCA use will be promoted within a context of

total communication in which the children and adults also use other modes of communication including signing and speech.

Sources for good practice in AAC and autism

Most of the literature considered here is from the field of AAC. A key source has been the SCOPE publication “*Supporting Communication through AAC*” (Hazell & Larcher 2005) in which a group of experienced British AAC practitioners aim to share “everything we know” about the practical application of AAC. AAC is an international field and I have particularly drawn on the work of Janice Light (Pennsylvania University) and Stephen Von Tetzchner (Oslo University) as sources for good practice. The American practitioner Joanne Cafiero (2005) is a passionate advocate of the use of dynamic display aids with children with autism and her work is included here.

In the AAC literature referenced here, children with autism are typically included within the heterogeneous group of AAC users with developmental disorders, their characteristic or individual AAC challenges and achievements may be recorded, but the general principles described are considered relevant to them.

Our communication intervention should reflect our understanding of language learning and communication in autism. I have considered principles from the AAC literature in the light of the “interactive model” of communication development in autism. This model underpins the musical interaction work developed at Sutherland House, described by Wendy Prevezer (2002).

Setting aims in AAC intervention

We should be ambitious and imaginative in our aspirations for AAC users (Blackstone et al 2007). However, a note of caution is often sounded in the AAC literature and I repeat it here. The use of technical AAC may generate high expectations (Hazel & Larcher 2005, Beukelman & Mirenda 2005) but communication with AAC is difficult within a speaking community and takes a long time to learn, even for adult users. Children will be novice AAC communicators for years and we must not set them up to fail through unrealistic short term expectations. There is a growing literature which records the characteristic features of children’s language with AAC (Von Tetzchner & Grove 2003, Beukelman & Mirenda 2005); this should inform our aims.

Introduction to the framework for intervention planning

Blackstone et al (2007) have suggested key principles to inform research and practise in AAC which reflect the views of researchers, practitioners, AAC users and their families. Blackstone et al (2007) include people with autism within the AAC community and specifically refer to AAC users with autism in their discussion of social inclusion.

Blackstone and colleagues present a holistic perspective of AAC users, this is wider perspective than Light's well established AAC competencies model (described in Beukleman & Mirenda 2005). Their principles challenge us to step beyond an AAC skill focus, to consider an individual's views, needs and aspirations, their social context and the current state of knowledge available to inform good practice.

Blackstone et al's (2007) paper facilitates a reflective approach to intervention planning and I have drawn on their principles to create a framework for a discussion of good practice in AAC and autism. At the end of each section I have summarised the key principles which will inform the current intervention planning. This goes beyond the model used in our pilot project (Checkley 2006).

Summary of principles for intervention planning

1. People who rely on AAC should participate actively in AAC practice.

Blackstone et al (2007) challenge us to consider how children who use AAC can express their opinions and influence their use of AAC; they recognise that this most important voice is often hardest to hear. Children need a personal vocabulary of self expression to communicate their opinions and the things that are important to them.

"Without a functional vocabulary, (i.e. the words the child needs rather than the words we think the child needs) it is impossible for the child to say what s/he wants to say" (Hazel & Larcher 2005 p6)

Their personal vocabulary will include the child's chosen words and suggestions of those who know them well. Children should have opportunities to explore using this vocabulary of self expression before it is needed in critical situations (Hazel and Larcher 2005). Children who use AAC typically have highly restricted and static vocabularies with which to express their intent. Light (1997) advocates including repair phrases such as "I want a new word", "I don't have a way to tell you" to enable the child to lead vocabulary selection and extend their expressive potential.

Equipping and enabling children to shape their use and experience of AAC resonates with the principle that a child should be an "active and willing partner" in a communication intervention (Christie 2007). This is a central principle in the interactive approach to autism.

Key principles;

- Children should be involved in directing their use and experience of AAC e.g. which words and themes to include and what is talked about.
- It is a priority to give children access to a personalised vocabulary of self expression and opportunities to practice using this.

2. AAC planning is to be based on well grounded and accepted theoretical understanding.

Blackstone et al (2007) expect AAC practitioners to be able to describe their model of language and communication development and to be able to show that their AAC practice is well grounded within the knowledge base for the field.

The interactive model of language learning

Currently the process of communication and language learning is understood as an interaction leading to the joint construction of meaning; it is not a linear relationship between a sender and receiver (Blackstone et al 2007).

Developmentally there are critical skills which allow the language learning interaction to occur; these include joint attention (shared focus) and turn taking. Interaction is the starting point of Light & Drager's (2005) intervention with young users of dynamic display aids. They aim to increase children's participation, social interaction and turn taking so that they become active participants in social communication. A defining principle of their work is the identification and creation of motivating situations in which participation and social interaction can be *sustained* (my emphasis). Joint attention is promoted as a precursor for conversations where information sharing and language learning can occur.

It is the process of participation and interaction that is prioritised rather than the language used. Similarly Von Tetzchner, Brekke et al (2005) ask communication partners to be part of the process of communication and the process of responding to communication challenges rather than to focus on eliciting "right answers".

This emphasis on process rather than outcome is shared with the interactive approach to autism practice. Children are facilitated to engage in frequent, extended, exaggerated and positive interactions as a context for learning (Prevezer 2002) Starting points similarly include establishing joint attention and shared participation. By experiencing and enjoying the power of their communication on others, children's intentionality may grow.

The following principles from AAC practice are common to language and communication interventions for children with autism. For example, enhancing the communicative opportunities in an environment, supporting understanding, planning for progression and generalisation are all key elements of good practice (Prevezer 2002)

Comprehension

Cafiero (2005) and Light (1997) and Ronski and Sevcik (1996) stress the importance of receptive language development in AAC interventions. Children who do not speak struggle to "fine tune" their understanding; they can not readily try out their words and receive feedback to check out their hypotheses. Listening and comprehension skills should be directly addressed alongside expressive skills through AAC.

AAC users face the challenge that receptive language and expressive language are in different modes, they typically hear spoken language and have to express themselves with a visual language. To build a language facility with AAC, the child needs to experience AAC receptively as well as expressively.

AAC Language learning environments.

Three main learning environments are described in the AAC literature; direct teaching, the “engineered environment” (Carfiero 2005) and “naturalistic” contexts.

Tetzchner, Brekke et al (2005) consider that direct instruction in AAC, “will always be necessary”; but that the skills learnt should be elaborated and practised in natural interactions throughout the child’s day. They describe “highlighting” language in everyday events as a technique to support incidental learning and language progress. Through “highlighting” ordinary spontaneous communication is made explicit with AAC and the communicative context becomes more inclusive. Similarly Hazel and Larcher (2005) consider that adding and exploring vocabulary as it arises in daily contexts is a powerful strategy for language learning.

Light (1997) and Von Tetzchner, Brekke et al (2005) describe how aspects of a child’s environment limit their potential to learn to use AAC and create barriers to communication. Through the engineered environment, a child’s communication and inclusion is planned and resourced and staff are trained to provide rich communication activities and opportunities (Chinner et al 2001).

“Communication opportunities must be identified, a need to communicate must be created and communication partners must be trained to provide these opportunities to the AAC user. In addition to identifying natural opportunities for communication, it is important to identify and eliminate barriers to communication.” (Carfiero 2005 p42)

Conceptual learning

Children develop conceptual understanding gradually; through social language experiences, children’s concepts mature. All children have to hear a word or see a sign in many situations in order to map its conventional meaning. For a range of reasons, children who use AAC have very restricted opportunities for conceptual development (Light 1997. Von Tetzchner, Brekke et al 2005).

Goldbart & Murray (2007) explain that we know very little about how AAC use shapes a child’s language learning or how they can develop flexible conceptual understanding with it. However, a core intervention aim in AAC is to try to build conceptual understanding. We may support this by giving children diverse experiences of words which go beyond the literal meaning depicted by the symbol and by enabling children to refine their word use through adult scaffolding.

AAC Language progression

Light and Drager (2007) and Hazell & Larcher (2005) describe the breadth and progression of skills to be included in AAC intervention, aiming for children to experience the power of communication and complex expression.

They introduce a range of communication functions so that children can use language for a range of purposes and work to build the complexity of children's language structures. Light also works on phonological skills as a basis for later literacy development. Hazell & Larcher (2005) offer a detailed and progressive skill development curriculum.

Key principles;

- The participative and interactive **process** of communication is prioritised over the outcomes of the communication. The aim is for children to experience enjoyed, frequent and sustained communication to as a context for learning.
- Both comprehension and expression should be addressed through AAC.
- Direct instruction should allow language and communication progression; introducing children to the range of language functions and to complex expression.
- Through naturalistic learning and by adding words as they are needed, children may be supported to generalise, expand and refine their language in their everyday contexts.
- The learning environment should be planned to be inclusive of children who rely on AAC; creating opportunities for and removing barriers to their communication.

3. . The AAC system should meet the skills and preferences of individual.

Blackstone et al (2007) challenge us to design systems that individual AAC users want to use and can use and which meet their individual abilities, challenges, preferences and priorities.

AAC makes multi-faceted demands on attention (Light & Drager 2007). To free attention for language and to make the experience of communication effortless, the operational demands of aid must be reduced and the aid made as easy to use as possible. For example, word cells may need to be altered to become more meaningful to children. Symbol systems such as PCS largely reflect adults' conceptualisations and this potentially slows down children's language learning (Von Tetzchner, Brekke et al 2005).

There is a balance to be achieved between ease of use and meeting a child's potential. Light & Drager (2007) consider that the language potential of young

AAC users is often underestimated and they are given access to simpler systems than they are able to benefit from.

The aid should be child friendly; children should want to use it. Light, Page et al (2007) observe that AAC systems are designed to reflect the way that adults think about the world, rather than to appeal to children and their peers. They asked children to design aids for other children and in these designs the aid became a multi-function, fun character, which made kids happy.

The autism and AAC approaches described here recognise that children have to be motivated to participate and communicate and that we have to create engaging contexts that they will want to join in. The key to this is that children we are working with, have fun! (Hazell & Larcher 2005, Prevezer 2002).

Key principles

- The AAC system should be easy and meaningful to use.
- The AAC system should offer wider language potential.
- The system should reflect children's interests and preferences.
- Motivation is fundamental; AAC must be fun.

4. The central role of the communication partner.

Blackstone et al (2007) state that an AAC intervention must reflect the important and sometimes unique roles communication partners play in the communication of AAC users.

“all theories of language development find exposure to language and interaction with competent language users necessary for language to emerge.” (Von Tetzchner & Brekke 2005 p85).

Speaking children grow up in a community of speakers, but children who use AAC are not part of a community of competent users and have to work out the transition from spoken input to symbol output alone. Such is the complexity of the child's challenge that an AAC intervention must enable a “language acquisition support system” to be provided by more competent children and adults (Tetzchner & Brekke 2005). A designated and skilled “communication partner” is an essential part of this support system.

Research into interaction patterns has consistently described turn taking pattern with children who use AAC are asymmetrical;

“adults talk a lot, occupying most of the conversational space...The caregivers exert a high degree of control over the interactions, providing limited and fixed slots for children to participate....” (Light 1997 p167)

AAC intervention should aim to achieve a greater “symmetry” and “parity” in both language and communication, between child and adult (Light 1997); the communication partner has a lead responsibility for this change. It is achieved for example, by adult and child sharing the same communication tools so that AAC becomes the context for the joint establishment of meaning (Von Tetzchner, Brekke et al 2005). It is also achieved by changing adult interaction patterns to facilitate the child’s expression.

Similarly in the interactive approach to autism, adults develop a “facilitative style” and tune in to the perspective of the child. However, this is not simply “following the child’s lead”; the aim is progression to interactive balance and reciprocity between child and partner, such that a “conversation” is achieved (Prevezer 2002).

Key principles

- Children need the support of a skilled communication partner who can guide their progress with AAC.
- The partner works to create greater balance and parity in language and communication with the child, by sharing the VOCA as a joint medium of communication and by using a facilitative communication style.

5. AAC interventions should enable people to develop their social networks and relationships and meet their personal goals.

Blackstone et al (2007) ask us to consider whether an AAC intervention supports participation and social interaction, enabling children to build their relationships and achieve social inclusion. We should consider how an intervention can enhance children’s interaction with their families, carers and friends and help them to deal with emotional challenges and to solve conflicts (Von Tetzchner, Brekke et al 2005)

We are also to consider how AAC may allow expression of the child’s “authentic self”; their personality, humour, creativity and aspirations. An intervention should consider how it supports an individual’s personal thought process, their “self talk” (Beukelman & Mirenda 2005) their self awareness (Hazell & Larcher 2005) and their self esteem.

Cafiero (2005) describes the positive impact of being part of a community of AAC users who share and develop communication together; the experience of symmetry and equality in communication, promotes an AAC users’ self esteem.

Fostering a positive self image is also promoted in the interactive approach, where an essential aim is to enable children to form a sense of themselves as intentional and interactive individuals (Prevezer 2002).

Key principles

- AAC intervention should address a child's social, emotional and personal growth, including their self esteem.
- Being part of a community of AAC users enhances self esteem.

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