NORSACA
quality of life for people with autism

Sutherland House School

Communication Aids Research Project

Report

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?

Introduction

Sutherland House School in Nottingham is a non-maintained special school for children with autism, run by the regional autism charity NORSACA.

In 2004 the school undertook a pilot research project looking at the use of alternative and augmentative communication (AAC), specifically voice output communication aids (VOCAs), by children with autism. The project suggested that these aids could bring positive changes in communication for children with little or no speech (Checkley 2006). The research project described in this paper aimed to build on the pilot project and explore in depth the use of computer based voice output communication aids by pupils with autism. Our aim was to carry out rigorous, collaborative, practice based research which will be of high validity and interest to a wider audience.

The research project was led by a speech and language therapist at Sutherland House School. It included three children aged 11 and 12 with autism and severe communication difficulties. The research partner was Sheffield Hallam University.

The project started in March 2008 and was completed in March 2010.

Research Context

As personal technology becomes ever more sophisticated and accessible, there is growing parental and practitioner interest in the relevance of communication technology to support the communication of people with autism. Between 33-50% of people with this diagnosis can't use speech functionally (National Research Council 2001). However, the research base for the field is very limited. The few studies which have investigated the use of VOCAS for people with autism generally used simple communication technology and researched the impact on requesting, usually for food (Schlosser, Sigafoos & Koul 2009).

Mirenda (2008) argues that researchers and practitioners make a series of assumptions about the communicative and learning potential of non verbal children with autism which leads to low expectations and the use of simple, conservative AAC interventions. Thus non-verbal children with autism rarely access flexible, generative, AAC systems that can support long term language development.
Certainly in the UK, computer based AAC, or "high tech AAC" is not routinely used with non-verbal children with autism. There is also no consensus about the value of communication technology for this population. For example, the use of high tech AAC is specifically excluded in a UK assessment guide for the use of communication aids with individuals with autism (Goldman 2002).

Mirenda (2008) suggests that research in this field has been held back by assumptions about the potential of people with autism and she challenges professionals to reconsider how AAC may support people with autism.

Research Aims

The aims of the research were to:

- provide research and descriptive data from our work with children with autism and severe language disorder who accessed computer based AAC, to inform practice in this under-researched and controversial area
- formally investigate evidence emerging from practice that VOCAs can enable the language and communication of children with autism
- enable the views of the students, their parents and staff within the research process and the evaluation of the intervention
- use a type of VOCA which can be economically created using educational and communication software run on school based hardware
- promote practice relevance at all stages

Research Questions

- How does access to a computer-based output communication aid (VOCA) change the language and communication of children with both autism and severe expressive language disorder in class curricular activities?
- How do children with autism make use of high tech VOCAs in their language and communication at school?
- How do children with autism experience access to computer-based VOCAs in controlled and free-choice settings?
- How is their experience evaluated by their communication partners; including families, carers and staff?

Intervention: Guiding Principles

The research intervention worked to the following principles of best practice in AAC.

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

Children need a personal vocabulary of self expression to communicate their opinions and the things that are important to them. 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.

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

Our practice was based on the interactive model of language learning characterised by an emphasis on process rather than outcome. It aimed to increase children's participation, social interaction and turn taking so that they became active participants in social communication.

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

The AAC system should be easy and meaningful to use and offer wider language potential. It should reflect the child's interests and preferences so that AAC can be fun.

4. The central role of the communication partner

The use of AAC presents children with a complex challenge and they need the support of a skilled communication partner who can guide their progress and build their communicative confidence.
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

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

Intervention; Key Components.

The intervention consisted of 5 components.

1. **A rich, accessible system for communication**
   A VOCA was created for each child using a laptop computer, running Grid 2 voice output communication software and Ingfield Dynamic Vocabularies. In this way each child accessed a relatively low cost generative communication aid providing them with a large and personalised vocabulary and also sentence building capacity.

2. **A dedicated communication partner from the staff team**.
   A trained member of staff took responsibility for supporting the child's use of the VOCA throughout the research period.

3. **Access to a communication aid skill building group for the 3 participating boys.**
   All the boys attended a weekly group with their communication partners in which they practised using their aids together.

4. **Access to planned opportunities to use their aids in a curricular lesson**.

Specific talking activities were planned in curricular literacy lessons to provide opportunities for the boys to use their aids. These lessons were used as the research context for quantitative data collection.

5. **Intervention managed by the lead researcher in collaboration with staff to form an AAC team**.
The speech therapist, 3 teachers and 3 teaching assistants from the school were collectively involved in the carrying out the intervention and in technological management of aids.

Methodology: Key Features

1. A sample size of three

This is consistent with previous published studies on the use of AAC by people with autism. The three boys were aged between 11½ and 12¼.

2. Multiple baseline design

A multiple baseline design examines the intervention effects on multiple behaviours for individual participants. In this study the intervention was introduced at staggered start times for the different participants and effects were shown when observed changes coincided with the interventions. The staggered design is more practical to manage in a real school context. It also guards against confounding variables, including maturation effects, in comparison with a standard design in which all participants start the baseline and intervention at the same point in time.

The field work was carried out over a 6 month period. During this period, data was collected for each child for 12 weeks. The children were observed during their weekly literacy lessons; these included a ten minute whole class talking activity. The first 3 weeks constituted the baseline sessions. In these sessions the participants had no access to VOCA but were provided with their usual paper based AAC aids. After the baseline period the participants were given access to the VOCA for the remaining nine weeks and this constituted the intervention period.

3. Recording a range of communicative behaviours

Observational data were derived from video recordings of the ten minute talking activity in the literary lessons, and from staff diaries. A range of communicative behaviours were categorised and recorded. These included: attention-directing, requesting, rejecting, greeting, self-expression, naming, giving information. The mode of communication was also recorded, e.g. speech, gesture or VOCA.

4. Measuring data reliability

All videotaped excerpts were first coded by the lead researcher. 25% of the data was then re-coded by independent second coders. Inter-rater reliability measures of between 70-90% for the different behaviours were recorded.

5. Involving parents

The study asked parents for their views; a member of the research team carried out one face to face interview with each family. The aim of the interviews was to identify what parents saw as the benefits and the drawbacks of their child using a VOCA, any impacts on their child's development and their aims and aspirations in relation to their child's communication development.

6. An attempt to determine the children's views of the VOCA

The study sought to determine the children's views of the VOCA using a mosaic approach; drawing data from different sources within the research to suggest the opinions of the children involved. This included records of the children expressing their like or dislike of the VOCAs by using self expression cells on the aids.

Findings

- Access to the aids was associated with significant increases in the complexity of the language the children used. All the boys combined more words in their communications when they accessed the aids.

- The extent to which the individual children used their VOCAs relative to their other modes of communication varied, but for all children speech and vocalisation remained their preferred mode of communication.

- All the children used their VOCAs to augment their task focused communication, i.e. they used them to meet the lesson expectations and so participate in the lesson. A small number of other uses including requesting were recorded. However, the children invariably communicated such intentions in different ways, for example using their speech and vocalisation.

- No common patterns were identified in the frequency and form of the children's communication in the lesson, rather access to a high tech VOCA was associated with individualised, but meaningful patterns of change. For example, one boy's communication frequency decreased as he took considerable time to assemble each complex sentence when he used his VOCA.

- No single approach allowed us to access the children's opinions reliably, but parent and staff contributions were found to enable a rich insight into the boys' experiences. Through these, distinct and individual profiles of the boys' interest in and response to the VOCA emerged.

- The qualitative analysis suggested that the impact of VOCA access for some children with autism may go beyond augmenting their language and communication to impact positively on other aspects of their development including learning and self esteem.

Managing the Research Project

Research planning led by Sutherland House School in collaboration with Sheffield Hallam University began in Spring 2008. Field work at the school commenced at the start of the academic year in September 2008 and continued to March 2009. Data analysis and the preparation of research articles were completed by December 2009. Two articles were submitted for publication in November 2009 and February 2010. The qualitative analysis of the "child's voice" was accepted and published by the Journal of Assistive Technology in March 2010. The quantitative analysis of changes in language and communication was rejected by the Journal AAC in June 2010. The revised article is to be submitted to another journal in Autumn 2010.

Review of the research aims

The project has met our research aims. It has generated practice based research, using accessible technology and has involved the children and other stakeholders in the evaluation of high tech communication aids for children with autism. The research will add to evidence base for this field, for example by recording that children with autism are able to use high tech VOCAs for more forms of communication than are currently described in the research literature. It will also add to the literature by suggesting an approach for accessing the "voice" of children with autism and little language, who are normally excluded from the evaluation process.

The Research Team members were of course disappointed by the response of the Journal AAC. The Editor welcomed the focus and context of the research but rejected it on methodological grounds. The school context, including the involvement of the children's own staff and their real lessons, challenged our ability to control all variables to the level the journal required. However, the interest we have had from parents, practitioners and producers of communication technologies, reassures us that our research studies and experiences will help to inform this area of practice.

Implications for Further Research

Future research may consider the achievements of children with autism when they access high tech VOCAs in their other communicative environments, particularly at home among their family.

Analysis of the relationship between patterns of VOCA use and children's individual characteristics may help to identify children who can benefit most from this technology.

As part of an investigation of intervention strategies, future research might identify software design features which facilitate the children's communication and use of language.

This research agenda could expand the empirical base, which we have sought to contribute to through this project. Such a research base could begin to

provide evidence based answers to parents' and practitioner's pressing questions about the value of high tech communication aids for their children with autism.

Further Information

Research papers arising from the project.

Checkley, R., Hodge, N., Chantler, S., Holmes, K., and Reidy, L.(2010), What children on the autism spectrum have to "say" about using high tech voice output communication aids (VOCAs) in an educational setting. *Journal of Assistive Technologies. 4* (1), 25-37.

Checkley, R., Reidy, L, Chantler, S., Hodge, N., & Holmes, K.(2010) "Black white zebra orange orange"; how children with autism make use of high tech VOCAs in their language and communication at school. (In press)

Working papers for the project.

Chantler, S., Hodge, N., & Reidy, L. (2008). *Methodology working paper.* Available at http://www.norsaca.org.uk/docs/SHS%20Communication%20Aids%20methodology%20working%20paper.pdf

Checkley, R. (2008) *Intervention working paper. Available at* http://www.norsaca.org.uk/docs/SHS-Communication-Aids-intervention-working-paper.pdf

Research referenced in the report

Checkley, R. (2006). The impact of high-tech AAC on the language and communication of students with autism. *Good Autism Practice, 7* (2), 13-21.

Mirenda, P. (2008) A back door approach to autism and AAC. *Augmentative and Alternative Communication, 24* (3), 220-234.

National Research Council (2001) *Educating children with autism*. Washington DC. National Academy Press.

Schlosser, R.W., Sigafoos, J., & Koul, R.K. (2009). Speech output and speech-generating devices in autism spectrum disorder. In Mirenda, Pat & Iacono, Teresa (Eds.), *Autism Spectrum Disorders and AAC* (pp. 141-169). Baltimore: Paul H. Brookes.