

Bangor University

PROFESSIONAL DOCTORATES

Social skills in adolescents with autism : testing the specificity of the deficit, and development of a DVD training intervention

Haddock, Katie

Award date:
2003

Awarding institution:
Bangor University

[Link to publication](#)

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal ?

Take down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

SOCIAL SKILLS IN ADOLESCENTS WITH AUTISM:
TESTING THE SPECIFICITY OF THE DEFICIT, AND
DEVELOPMENT OF A DVD TRAINING INTERVENTION

Katie Haddock

*Department of Clinical Psychology, University of Wales, Bangor,
Gwynedd, LL57 2DG*

Dr Robert Jones

Clinical Psychologist, University of Wales, Bangor, Gwynedd, LL57 2DG

I'W DDEFNYDDIO YN Y
LLYFRGELL YN UNIG

Dr Steve Noone

*Clinical Psychologist, Learning Disabilities Service, North-West Wales
NHS Trust, Llanfairfechan, Gwynedd, LL33 0HH*

TO BE CONSULTED IN THE
LIBRARY ONLY

Thesis submitted in partial fulfilment of the requirement of the Degree of
Doctorate in Clinical Psychology

Running Head: *Social skills training in autism*



Title: Social skills in adolescents with autism: Testing the specificity of the deficit, and development of a DVD training intervention.

Summary

Current diagnostic criteria for autism are guided by the ‘Triad of Impairments’ (Wing & Gould, 1979), of which ‘social impairment’ forms an individual category. Social difficulties have been observed in children with autism under the age of two years and the difficulties continue throughout adulthood. Few studies have used computer-based training packages (CBTP’s) to facilitate social competency in individuals with autistic spectrum disorder (ASD). The present study was completed in two phases: *Phase I* – compared 14 individuals with ASD ($IQ \geq 70$), ten individuals with no disabilities (ND) and eight individuals with mild mental retardation (MR; $IQ 50-70$) on their ability to identify appropriate and inappropriate social interactions using 12 scenarios on a tailor-made DVD. *Phase II* - the ASD group was divided into two groups. Eight individuals were trained using six of the scenarios from Phase I and eight new scenarios. Following training, both groups with ASD re-viewed the 12 scenarios shown in Phase I. The results showed that individuals with ASD were less able to identify appropriate and inappropriate social skills than individuals with MR ($t(18) = 4.9, p < .001$) or ND ($t(13) = 7.5, p < .001$). The severity of the autistic symptoms negatively impacted on performance ($r(14) = -.83, p < .001$). The training group significantly improved their performance ($z = -2.52, p = .05$) on both trained ($z = -2.207, p = .027$) and untrained scenarios ($z = -2.032, p = .042$). The untrained group scores showed no significant difference between Phase I and Phase II. The current study identified that individuals with autism have more difficulty understanding inappropriate and appropriate behaviour than their MR and ND peers. However the DVD was an effective method of training a component of social competency for this population. Within the trained group, ability improved on untrained as well as trained scenarios, this suggests a generalisation of skills rather than rote learning or practice effects. Future studies would benefit from addressing how to generalise this skill from computers to ‘real-life’ situations.

Contents	Section – Page
Title	i
Summary	ii
Contents	iii-vi
Acknowledgements	vii
Declaration	viii
Ethics Proposal	Section 1
North Wales Health Authority Research Ethics Committee (East, Central & West sub-committees) application form for the approval of research.	1-16
Appendix 1	17-102
Literature Review	Section 2
Title Page	103
Abstract	104
Introduction and Theories	105-109
Historical overview of social skills training for Individuals with autism.	109
Child-specific training	109-112
Adult-child training	112-113
Peer-child training	113-117
Class-wide training	117-119
Factors which support social interaction	120-122
The future of social skills training	122-125
Conclusions	125
References	126-141

Appendix 2.1	142-146
Research Paper	Section 3
Title Pages	147
Abstract	148
Introduction	149-153
Method	153-156
Participants	153
Materials	154-157
Wechsler Abbreviated Scale of Intelligence (WASI)	154
Autism Behavior Checklist (ABC)	155
DVD Scenarios	155
Procedure	157
Results	159
Phase I – Provisional analysis	159
Phase I – Test Performance	159
Phase II	160
Discussion	162-165
Tables	166-168
References	169-176
Appendix 3.1	177-180
Critical Review	Section 4
Title page	181
Background	182-184

Method	184
Recruitment	184
Consent	185
Confidentiality	186
Design	187
Measures	187-190
General Limitations	190
Process Issues	190-191
Future Research	191
References	192-193
General Appendices	194-195

Appendix 1 Ethics Proposal

1.1	Wechsler Abbreviated Scale of Intelligence	18-25
1.2	Autism Behavior Checklist (modified version)	26-29
1.3	School Letter	30-32
1.4	Information sheet for parents with children with autism	33-40
1.5	Information sheet for parents with children without autism	41-47
1.6	Information sheet for children with autism (intervention)	48-58
1.7	Information sheet for children with autism (control)	59-69
1.8	Information sheet for children with mild learning disabilities	70-79
1.9	Information sheet for children with no disabilities	80-84
1.10	Consent form for participants	85-87
1.11	Consent Flowchart: 'The Eastman Test'	88-89
1.12	Researchers' CVs	90-91

1.13	Research Protocol	92-99
1.14	Letters confirming Ethical Approval	100-102

Appendices 2 Literature Review

2.1	Author's Notes	142-146
-----	----------------	---------

Appendices 3 Research Paper

3.1	Author's Notes	177-180
-----	----------------	---------

Appendices 4 General Appendices

4.1	Statement of word count for components of thesis	194-195
-----	--	---------

Acknowledgments

I would like to thank Dr Robert Jones for his unfailing support, patience and motivation throughout this project and Dr Steve Noone for his clear thinking and creativity during the planning stages.

Secondly, I would like to thank all of my family and friends, especially Dad, Simon, Sabrina and Abi for their constant support throughout the course. Special thanks go to Angharad for her proof reading skills and warm words. A special mention to my best friend, my mum – who has always had a great capacity to listen, support, and (most importantly) make me laugh!

Finally a heartfelt thanks to all of the health professionals, head teachers, class teachers, parents and students who have made this study possible.

This study is dedicated to my Nan, who would have proudly put the thesis on her bookshelf and boasted about the contents that she hadn't read!

SECTION 1
ETHICS PROPOSAL

Awdurdod Iechyd Gogledd Cymru
North Wales Health Authority
Research Ethics Committee
(West, Central & East sub-committees)

Important guidance notes accompany this form. Applicants MUST refer to the corresponding note before answering each question. Incomplete forms cannot be accepted.

1. Title of project :

A CD-ROM based computer-training package for individuals with autism - a pilot study.

2. Principal investigator :

name : Katie Haddock

address : Clinical Psychology Course
43 College Road
Bangor
Gwynedd
LL57 2DG

job title: Trainee Clinical Psychologist

telephone number: 01248 382205

(All correspondence should be addressed to Katie Haddock at the above address)

3. Other investigators : Dr Robert Jones
Clinical Psychologist
University of Wales, Bangor
(Address as above)

4. Who is initiating this project?

Katie Haddock and Dr Robert Jones are initiating this project. This project will be submitted as an assessment of research competence for the Doctorate of Clinical Psychology Course, University of Wales, Bangor. Dr Robert Jones will supervise the entire project.

5. Where will the research take place?

In selected schools in North Wales, who will be contacted following ethical approval.

Ethical approval is sought from:

- (1) University of Wales School of Psychology Research Ethics Committee
- (2) North Wales Health Authority Research Ethics Committee (West, Central & East sub-committees)
- (3) Head of education authority in North Wales

6. Objectives of the project :

This projects main objectives are:

- (1) To assess whether individuals with autism can identify inappropriate social behaviour from scenes on a CD-ROM.
- (2) To assess whether there is a difference in the identification of inappropriate social behaviour by individuals with autism, individuals with mild learning disabilities, and individuals without disabilities.
- (3) To assess whether a CD-ROM based social skills training package can improve social skills in individuals with autism.
- (4) Assess whether the social skills training package promotes developed social skills in new social situations.

7. Scientific background to the project:

Autism is diagnosed according to a triad of impairments in communication, socialisation and imagination (Wing & Gould, 1979). Arguably the socialisation difficulties are the most debilitating feature of autism (Rogers, 2000). Socialisation difficulties can include: (i) problems or lack of interest in mixing with peer group, (ii) problems with understanding the subtleties of social situations, (iii) inappropriate social or emotional responses, and (iv) resistance to changes in routine (Attwood, 1997).

Children and adolescents with autistic spectrum disorders often behave inappropriately when interacting and communicating with other people (Wing, 1992). Many studies have identified a number of problems that individuals with autism have with understanding the thoughts, beliefs and feelings of other people (Leslie & Frith, 1990; Loveland et al, 1995). This inability to understand others could maintain the social skills problems that individuals with autism face (Loveland, Pearson, Tunali-Kotoski, Ortegon & Gibbs, 2001).

Loveland, Pearson, Tunali-Kotoski, Ortegon and Gibbs (2001), using examples of appropriate and inappropriate behaviour recorded on videotape, found that a group of

children with autism were less skilled at identifying inappropriate behaviour compared to a matched control group without autism.

Many studies have investigated the most appropriate way to try and teach individuals with autism, and historically this has relied on behavioural interventions (Jacobson, Mulick & Green, 1998). However, recent research has identified that individuals with autism may respond more readily to computer-based programmes rather than teachers (Heimann, Nelson, Tjus & Gillberg, 1995). Specifically, Bernard-Opitz, Sriram and Nakhoda-Sapuan (2001) reported that computer based programmes effectively taught the children with autism social problem solving skills.

As the evidence base for teaching individuals with autism suggests that computer-based programmes may be the most appropriate method, the present study has produced a CD-ROM which includes a number of appropriate and inappropriate social interactions, all involving speech. It is proposed that the CD-ROM can both assess the ability of individuals with autism to interpret social situations in comparison to learning disabled individuals (without autism) and children without disabilities, and teach them about appropriate and inappropriate interactions. Furthermore, the CD-ROM will assess whether any new skills that have been acquired from the training package can generalise to new social situations.

References:

Attwood, T. (1997). *Asperger's Syndrome: A guide for parents and professionals*. London: Jessica Kingsley Publishers.

Bernard-Opitz, V., Sriram, N., & Nakhoda-Sapuan, S. (2001). Enhancing social problem solving in children with autism and normal children through computer-assisted instruction. *Journal of autism and developmental disorders*, 31 (4), pp 377-384.

Heiman, M., Nelson, K. E., Tjus, T., & Gillberg, C. (1995). Increasing reading and communication skills in children with autism through an interactive multimedia program. *Journal of autism and developmental disorders*, 25, pp 459-480.

Jacobson, J. W., Mulick, J. A., & Green, G. (1998) Public policy and the punishment of the powerless. *Child and Adolescent Mental Health Care*, 3 (1), pp 7-18.

Leslie, A.M., & Frith, U. (1990). Prospects for a cognitive neuropsychology of autism: Hobson's choice. *Psychological Review*, 97, pp 122-131.

Loveland, K.A., Pearson, D.A., Tunali-Kotoski, B., Ortegon, J., & Gibbs, M. C. (2001) Judgements of social appropriateness by children and adolescents with autism. *Journal of autism and developmental disorders*, 31 (4), pp 367-376.

Loveland, K.A., Tunali-Kotoski, B., Chen, R., Brelsford, K. A., Ortegon, J., & Pearson, D. A. (1995). Intermodal perception of affect in persons with autism or Down syndrome. *Development and Psychopathology*, 7, 409-418.

Rogers, S. J. (2000). Interventions that facilitate socialization in children with autism. *Journal of autism and developmental disorders*, 30, pp 399-409.

Wing, L. (1992). Autism initiative: Can functional assessment replace medical diagnosis evaluation? *BC Medical Journal* (34), 6, pp 387.

Wing, L., & Gould, J. (1979). Severe impairments of social interaction and associated abnormalities in children: epidemiology and classification. *Journal of autism and developmental disorders*, 9, pp 11-29.

8. Study design (incorporating randomisation and placebo details) :

Methodology

Study design

Four groups of school-aged children will be involved in this research (1) 10 children with autism (2) 10 children with autism (3) 10 children with mild learning disabilities (4) 10 children without disabilities. A between groups design will be adopted.

Each group will be assessed for their skills in detecting appropriate and inappropriate social interaction depicted on CD-ROM. It is hypothesised that the identification of inappropriate social interaction skills will be poorer in the children with autism than in the group with mild learning disability and the group with no disabilities. Subsequently one group of children with autism will receive a social skills training intervention and the other group will act as a waiting-list control. This will ensure that any changes seen will be a result of the intervention itself and not just due to the passage of time. The individuals with autism will be randomly allocated into either the waiting-list control or intervention group.

Inclusion/Exclusion criteria

Within the 2 groups of autism, all participants will have to score above 65 on the Autism Behaviour Checklist and have an IQ score above 70. The participants in the mild learning disabilities group will have to score below 65 on the Autism Behaviour Checklist and have an IQ between 55 and 70. The participants without disabilities will have to score below 65 on the Autism Behaviour Checklist and have an IQ within normal range. Children with ADHD will be excluded from this study.

Measures

The following questionnaires will be administered to each participant:

1. Wechsler Abbreviated Scale of Intelligence (WASI) (Appendix 1.1)(The Psychological Corporation (1999))

To measure IQ the WASI will be administered to each participant. The WASI is a short and reliable measure of intelligence in clinical, psycho educational and research settings. It is designed for use with individuals aged from 6 to 89, with or without a learning disability. The WASI consists of four subtests: Vocabulary, Block Design, Similarities and Matrix reasoning. It is nationally standardised and yields the three traditional Verbal, Performance and Full Scale IQ score. The assessment takes approximately 30 minutes to administer. Good test-retest reliability of .87-.92 for the IQ scales in the adult population, were found on this assessment tool.

2. Autism Behaviour Checklist (Modified version) (ABC) (Appendix 1.2). (Volkmar, Cicchetti, Dykens, Sparrow, Leckman, & Cohen, 1988)

To control for autistic spectrum disorder an ABC will be completed for each participant. This will ensure that the participants with mild learning disabilities and those without disabilities are not on the autistic spectrum. The modified checklist is presented in a simple yes/no format; this version is a simple and reliable version for parents or teachers to use.

The ABC is a 57 item screening instrument for autism. The ABC is grouped in the following five subscales: Sensory, Relating, Body and Object Use, Language and Social and Self-help skills. The scores are correlated by adding the total score from each of the subscales. A score of 67 or above suggests a high probability of having autism, 53-67 suggests that the individuals possibly has autism and those with scores less than 53 are unlikely to have autism. A good interrater reliability of 95% was found for this checklist.

Procedure

Following consent from University of Wales School of Psychology Research Ethics Committee, North Wales Health Authority Research Ethics Committee (West, Central & East sub-committees) and the Head of education authority in North Wales, the researcher will send a letter to mainstream and special schools in North Wales (Appendix 1.3). All schools that wish to take part in the research will meet with the researcher to discuss the full implications of the research. Following consent from the school an information sheet including a consent form will be sent to the parents of potential participants to acquire consent to approach their child, this letter will also include the ABC for parents to complete (Appendix 1.4 & 1.5). All parents will be given the opportunity to discuss the research with the researcher.

To gain consent from the child, the researcher will meet with the child to present and discuss the information sheet (Appendix 1.6,1.7,1.8 &1.9). Following this the child will be given up to one week to decide whether they would like to take part and sign the consent form (Appendix 1.10). All teachers will also be informed of the research and the procedure. Following consent, the study will consist of four phases:

Phase 1: Assess all participants with the WASI.

Phase 2: All four groups of participants will be shown a CD-ROM of social interactions and will be asked to specify whether the scenario is an appropriate or inappropriate interaction. They will also be asked to outline the reasons behind their choices. Their responses will be scored and compared against pre-determined criteria.

Phase 3: Complete CD-ROM training with half of the scenarios shown in phase 2 with one group of individuals with autism. The training will consist of showing the participant the scenarios on the computer and asking them to select one of three options i.e. appropriate interaction, too much eye-contact or too little eye-contact. The participant will then have feedback on why their answer was correct or incorrect.

Phase 4: View all of the scenarios shown in phase 2 again. Re-assess the ability of the two groups of children with autism to identify appropriate or inappropriate interactions. Both groups will be asked to outline their reasons. Assess for generalisability by comparing the intervention groups scores with the control groups scores in the scenarios that were not used for training.

The children with mild learning disabilities and the children without disabilities will only complete phase 1 and 2.

Following consent, the researcher will organise an agreed date and time with the child to complete the assessments. Phase 1 will take between 30-45 minutes. Phase 2 will take approximately 30-45 minutes. Phase 3 will take between 1 hour and 2 hours. Phase 4 will take approximately 30-45 minutes.

The researcher will arrange a convenient time with each child to complete the assessments. All of the assessments will be completed within school hours. For the participants completing phases 3 and 4, further times will be arranged to complete the package and outcome measures.

Each participant will be made fully aware throughout the process that they can withdraw from the research. The researcher will be available at all times to discuss any issues/questions that any of the participants might have. All participants will be given the option of a parent/teacher sitting in throughout the whole process.

Statistical Analysis:

For phase 2: Data will be analysed using a one-way between subjects analysis of variance.

For phase 4: Data will be analysed using a split plot analysis of variance. The between subjects factor is whether or not the participant received the intervention. The repeated measures factor is the pre and post test using the CD-ROM scenarios.

9. Have you had statistical advice in preparing your protocol? If so, from whom?

Dr Richard Hastings, Reader in Psychology and Research director of the North Wales Clinical Psychology Course, University of Wales Bangor.

10. What are the possible benefits and hazards of this research?

Computer based training programmes for individuals with autism, have been scarcely researched. Therefore a possible benefit of this training programme is that a new instrument for teaching people with autism social skills may be developed. The group of individuals with autism involved in this study may develop skills in understanding everyday interactions that have previously been difficult to comprehend. The future direction of teaching individuals with autism may be influenced by the outcome of this study.

However this programme is time consuming, and 2 groups of children (mild learning disabilities and children without disabilities) will not benefit directly from this research at the present time. Yet, their inclusion is a vital part of understanding the social skill problems that individuals with autism face. All of the children and their families/guardians will be informed that participation is entirely voluntary.

There is also an ethical implication with completing the research in school time. To try and control for the child missing out on school activities, the researcher will organise times where the child and parent/guardian feel it is appropriate to conduct the assessments. Phase 3 is the most time consuming phase, however, the CD-ROM training package is likely to be considered a valuable academic exercise for the individuals with autism.

The study will involve 2 groups of individuals with autism, one of which will not be completing the training package. This is essential to compare the benefits of the training. However, should the package be successful the control group of individuals with autism will be offered the opportunity to benefit from the training.

All participants will also be given the opportunity to have a teacher in the room throughout the assessment process. The researcher has experience of working with children and has been fully police checked.

11. Participants :

11.1 type of participant

Four groups of school-aged children will be involved in this research (1) 10 children with autism (2) 10 children with autism (3) 10 children with mild learning disabilities (4) 10 children without a disability. All participants will be attending schools in North Wales.

11.2 method of recruitment

Head teachers of the schools in North Wales will be approached and informed of the study. This will include both mainstream and special schools. Informally 2 schools have expressed an interest in being part of the research process. Having gained consent from the Head teacher, the researcher will meet with the staff team and explain the research process. Following this meeting the staff team will be asked to identify children that may benefit from the programme and who would be willing to participate. Letters will then be sent to the children's families/carers via the school – to ensure confidentiality. All of the parents/guardians will be given the opportunity to discuss the study with the researcher. Should they feel the information sheet explains the research sufficiently they will be able to complete a consent form and complete the ABC attached to the letter. Having gained consent from the parents, the children will be approached and fully briefed about the procedure of the study and asked whether they would like to take part. The children will then be given up to one week to decide whether they want to take part in the research and sign the consent form.

11.3 numbers of participants involved

In each of the four groups the study will recruit 10 participants. Therefore 20 individuals with autism, 10 individuals with mild learning disabilities and 10 individuals from mainstream education without autism or a learning disability.

11.4 age groups involved

The CD-ROM has been produced using actors aged between 15 and 17 years. Therefore the research will aim to target this age group.

11.5 do you intend to recruit 'vulnerable' participants?

(if yes, please explain)

Yes. As all of the participants will be children, this study will recruit vulnerable participants. Care will be taken to not exploit the participants' vulnerability. This will be ensured in five ways:

- (1) Teachers will only be asked to recommend children who they feel would benefit from the study. They will be explicitly asked to consider whether the child would be comfortable participating.
- (2) All participants and their families will be informed that their participation is entirely voluntary, and should they choose to decline participation this will not effect their educational placement in any way.
- (3) Parents/guardians will also be informed that should they choose to participate and later decide to withdraw, this decision will not effect their educational placement in any way.
- (4) The researcher and supervisor will be available to discuss any issues that may arise for the child, parent/guardian or the school at any time.
- (5) All psychological assessments will be kept in a locked filing cabinet. Each child's assessment will be given a code to ensure anonymity. Only the researcher and the supervisor will have access to the child's assessment results.

11.6 will consent be written or oral, or both?

The consent will be both a written and oral agreement between the psychologist and child and family/guardian. The participants and their family will be presented with a bilingual information sheet and consent form, which they will sign to give consent. If the child is unable to give informed consent a parent/guardian who knows the child well will establish whether the child is consenting, and then sign the form on their behalf.

11.7 are participants competent to give informed consent?

The parents/guardians are all competent to give consent. However, parents of children with mild learning disabilities who also have a learning disability themselves will not be included in this study – the school will be asked to identify and then not include these parents. The children without disabilities will also be considered able to give informed consent.

To try and establish informed consent the teachers will be presented with a Department of Health leaflet (March 01), which presents a flowchart representation of the 'Eastman test' (British Medical Association and Law Society, 1995; Appendix 1.11). Based on these guidelines the teachers will be shown the modified version of the information sheet and asked whether the information is clear enough for the child to give informed consent. If the teacher states that the child is likely to understand, the children from the autism and the mild learning disabilities groups will meet with the researcher and talk through the procedure.

As all of the participants will be selected for average or just below average IQ level, informed consent is not considered a substantial problem if presented clearly to the children.

11.8 how much time will be allowed between explaining the research and requesting consent?

Up to one week will be given for the participants to discuss and evaluate their decision.

11.9 who will witness the consent?

The researcher will witness the consent in every case. A Parent/guardian or teacher will also witness the explanation of the procedure to the child and the consent.

11.10 will individuals already participating in other research be excluded?

Yes. This study is time consuming, and it would therefore be unfair to include the child in more than one research study at a time.

11.11 will participants be inconvenienced in any way as a result of taking part in the study?

Only in the respect of time. The CD-ROM training package could be considered an academic task, but the assessment process is not academically beneficial to the participants.

11.12 will participants receive payment or reward for taking part? If so, please give details.

No.

12. Disclosure of payment or reward to investigators :

12.1 will any payment be made to the investigators or department / unit in respect of this trial?

No

12.2 if yes, will the payment be a block grant, or will it be based on the number of participants recruited ?

N/A

12.3 if a block grant, please state amount awarded and explain how monies received will be spent.

N/A

12.4 if payment is based on number of participants recruited, please state total sum payable per capita, and number of participants agreed.

N/A

12.5 will participants be informed if the investigator / department is receiving payment, and if so, will they be told the name of the sponsor?

N/A

12.6 do any of the investigators have a personal involvement in the sponsoring company? If so, please give details.

N/A

13. Consent of others clinically involved :

13.1 will the participant's GP be informed of their involvement in the project?

No

13.2 will the consent of others clinically involved be obtained?

The education authority will be made aware of the study and the researcher will seek consent from them and the schools will be asked for consent to approach the children.

14. Resource / service implications :

14.1 will your research have resource / service implications for the NHS?

No.

14.2 if yes, please indicate the applicable areas

N/A

14.3 have you discussed any additional workload and / or financial consequences of your project with the departments and budget holders concerned?

N/A

15. Extra substances to be given to the participants :

15.1 additional drugs

N/A

15.2 dosage form and presentation of these drugs

N/A

15.3 route of administration of these drugs

N/A

15.4 amount

N/A

15.5 frequency

N/A

15.6 desired effect

N/A

15.7 possible side effects

N/A

15.8 precautions

N/A

15.9 does the study medicine to be used have a marketing authorisation (product licence)?

N/A

15.10 if yes, will the medicine be used in accordance with, and for the indications specified in, the licence?

N/A

15.11 if the medicine does not have a product licence, or it will not be used in accordance with a product licence, does it have a clinical trial certificate (CTC) or an exemption under either the CTX or DDX schemes?

N/A

15.12 is the clinical trial randomisation code to be held by pharmacy?

N/A

15.13 what procedures will be followed if the codes are to be broken in an emergency?

N/A

15.14 please give full details of any other extra (non-drug) substances to be given to participants

N/A

16. Extra interventions :

16.1 will the project involve any extra venous samples? If so, please give details.

N/A

16.2 will the project involve any extra arterial samples? If so, please give details.

N/A

16.3 will the research involve extra x-rays, radiation, ultrasonics, scanning, ecg or other tests? If so, please give details.

N/A

16.4 will the research involve extra biopsies? If so, please give details.

N/A

16.5 will the research involve extra local or general anaesthesia? If so, please give details.

N/A

16.6 will the research involve any other extra invasive procedures such as cannulae, probes, catheters, internal examinations, endoscopies or lumbar punctures? If so, please give details.

N/A

16.7 will the research involve extra psychological tests? If so, please give details.

Only those outlined in the assessment process.

16.8 will the research involve extra questionnaires? If so, please give details.

Only those outlined in the assessment process.

16.9 will the research involve any other extra procedures not mentioned above, such as those using heat or electricity etc.? If so, please give details.

N/A

16.10 will the research necessitate any treatments or procedures being withheld which would otherwise be administered? If so, please give details.

N/A

17. Ionising radiation :

17.1 will subjects be exposed to ionising radiation as part of this study?

N/A

17.2 if so, specify the procedures which will be performed, and state the total effective dose in msv which will be received.

N/A

18. What problems may hinder successful completion of this study?

Recruitment difficulties may hinder successful completion of this study. Also difficulties obtaining consent from the education authority – though schools in the area have already expressed an interest in being involved.

19. What steps will be taken to safeguard confidentiality of the research records?

As mentioned, all psychological assessments will be coded to ensure anonymity. Only the researcher and supervisor will have access to the list of names. All assessments and

information will be kept in a locked filing cabinet. No names will be given in the write-up.

20. Please explain any arrangements made for indemnity cover for participants.

None beyond usual patient NHS provision.

21. Does the project comply with the requirements of the data protection act?

Yes.


22. Please state the anticipated start and end dates for your study.

Start date – December 2002

Completion date - July 2003

23. Investigator's declaration:

The information provided above is to the best of my knowledge accurate. I fully understand my obligations and the rights of the participant, particularly with regard to freely given informed consent.

Signed:  Print name: K. HADDOCK Date: 14.10.02

24. Head of Department's endorsement:

I hereby endorse this research proposal with my approval.

Signed:  Print name: DR R. HASTINGS Date: 14/10/2002

Appendices

Appendix 1.1 – Wechsler Abbreviated Scale of Intelligence

Appendix 1.2 – Autism Behavior Checklist (Modified Version)

Appendix 1.3 – School letter

Appendix 1.4 – Information sheet for parents with children with autism

Appendix 1.5 – Information sheet for parents with children without autism

Appendix 1.6 - Information sheet for children with autism (intervention group)

Appendix 1.7 – Information sheet for children with autism (control group)

Appendix 1.8 - Information sheet for children with a mild learning disability

Appendix 1.9 - Information sheet for children with no disabilities

Appendix 1.10 – Consent form for participants

Appendix 1.11 – Consent flowchart

Appendix 1.12 – Researchers' CVs

Appendix 1.13 – Research protocol

Appendix 1.14 – Letters confirming ethical approval

Appendix 1.1 – Wechsler Abbreviated Scale of Intelligence

**Third Party Material excluded from digitised copy.
Please refer to original text to see this material.**

Appendix 1.2 – Autism Behavior Checklist (Modified Version)

Autism Behavior Checklist – Instructions

The following checklist consists of 57 behavioural characteristics. Please consider ALL of the behavioural characteristics in the list, and decide for each one whether or not it accurately describes your child. If it is difficult to decide, answer in terms of what you feel best describes your child most of the time. Please respond to each of the statements by circling either YES (if it accurately describes your child) or NO (if it does not).

- YES NO Whirls self for long periods of time
- YES NO Learns a simple task but “forgets” quickly
- YES NO Frequently does not attend to social/environmental stimuli
- YES NO Does not follow simple commands given once (sit down, come here, stand up)
- YES NO Does not use toys appropriately (spins, tires, etc.)
- YES NO Poor use of visual discrimination when learning (fixates on one characteristic such as size, colour, or position)
- YES NO Has no social smile
- YES NO Has pronoun reversal (you for I, etc.)
- YES NO Insists on keeping certain objects with him/her
- YES NO Seems not to hear, so that a hearing loss is suspected
- YES NO Speech is atonal and arhythmic
- YES NO Rocks self for long periods of time
- YES NO Does not (or did not as a baby) reach out when reached for
- YES NO Strong reactions to changes in routine/environment
- YES NO Does not respond to own name when called among two others (Joe, *Bill*, Mary)
- YES NO Does a lot of lunging and darting about, interrupting with spinning, toe walking, flapping etc.
- YES NO Not responsive to other people’s facial expressions/feelings
- YES NO Seldom uses “yes” or “I”
- YES NO Has “special abilities” in one area of development, which seems to rule out mental Retardation (“mental handicap”)
- YES NO Does not follow simple commands involving prepositions (put the ball on the box” or “put the ball in the box”)

- YES NO Sometimes shows no “startle response” to a loud noise (may have thought child was deaf)
- YES NO Flaps hands
- YES NO Severe temper tantrums and/or frequent minor tantrums
- YES NO Actively avoids eye contact
- YES NO resists being touched or held
- YES NO Sometimes painful stimuli such as bruises, cuts, and injections evoke no reaction
- YES NO Is (or was as a baby) stiff and hard to hold
- YES NO Is flaccid (doesn’t cling) when held in arms
- YES NO Gets desired objects by gesturing
- YES NO Walks on toes
- YES NO Hurts others by biting, hitting, kicking etc.
- YES NO Repeats phrases over and over
- YES NO Does not imitate other children at play
- YES NO Often will not blink when a bright light is directed toward eyes
- YES NO Hurts self by banging head, biting hand, etc.
- YES NO Does not wait for needs to be met (wants thing immediately)
- YES NO Cannot point to more than five named objects
- YES NO Has not developed any friendships
- YES NO Covers ears at many sounds
- YES NO Twirls, spins and bangs objects a lot
- YES NO Difficulties with toilet training
- YES NO Uses 0-5 spontaneous words per day to communicate wants and needs
- YES NO Often frightened or very anxious
- YES NO Squints, frowns, or covers eyes when in the presence of natural light
- YES NO Does not dress self without frequent help
- YES NO Repeats sounds or words over and over
- YES NO “Looks through” people
- YES NO Echoes questions or statements made by others

- YES NO **Frequently unaware of surroundings, and may be oblivious to dangerous situations**
- YES NO **Prefers to manipulate and be occupied with inanimate things**
- YES NO **Will feel, smell, and/or taste objects in the environment**
- YES NO **Frequently has no visual reaction to a “new” person**
- YES NO **Gets involved in complicated “rituals” such as lining things up, etc.**
- YES NO **Is very destructive (toys and household items are soon broken)**
- YES NO **A developmental delay was identified at or before 30 months of age**
- YES NO **Uses at least 15 but less than 30 spontaneous phrases daily to communicate**
- YES NO **Stares into space for long periods of time**

Appendix 1.3 – School letter

(Headed Paper)

Dear

I am a Trainee Clinical Psychologist and I am currently carrying out a study that explores whether individuals with autism have particular difficulty with social skills. If there are particular problems, I would like to complete a computer-based training package to try and improve their social skills. I am trying to recruit 10 participants with mild learning disabilities, 20 participants with autism but no learning disability, and 10 participants without disabilities. I am looking for adolescents aged between 15 and 17 years old. This letter is being sent to schools around North Wales. I would be grateful if you would read the information sheet, which will be sent to the children's parents, should you be willing to participate.

The study has been approved by the School of Psychology, University of Wales, Bangor, Research Ethics Committee and the North Wales Health Authority Research Ethics Committees (West, Central & East subcommittees) and their addresses are provided below.

- | | |
|---|---|
| <p>i. School of Psychology, UWB,
Research Ethics Committee
Brigantia Building
College Road
BANGOR
Gwynedd
LL57 2DG
Tel: 01248351151</p> | <p>ii. North Wales Health Authority Research
Ethics Committee
Clinical Governance Support Unit
Ysbyty Gwynedd Hospital
BANGOR
Gwynedd
LL57 2PW
Tel: 01248384877</p> |
|---|---|

Dr Robert Jones, Clinical Psychologist, Conwy and Denbighshire NHS Trust, Learning Disability Service will supervise the project.

Should you feel that you have adolescents who would be suitable and willing to participate or if you would like to discuss the option of this research and arrange a date for me to come and explain the proposal further please contact me on 01745443314.

Thank you for taking the time to consider participating in this study.

Yours sincerely

Katie Haddock
Trainee Clinical Psychologist

Dr Robert Jones
Clinical Psychologist

Annwyl

'Rwyf fi'n Seicolegydd Clinigol dan Hyfforddiant ac ar hyn o bryd 'rwy'n gwneud astudiaeth sy'n ymchwilio a yw unigolion gydag awtistiaeth yn cael trafferth penodol gyda sgiliau cymdeithasol. Os oes problemau penodol, fe hoffwn gwblhau pecyn hyfforddi cyfrifiadurol i geisio gwella eu sgiilau cymdeithasol. 'Rwy'n ceisio recriwtio 10 gydag anableddau dysgu ysgafn i gymryd rhan, 20 gydag awtistiaeth ond dim anabledd dysgu, a 10 i gymryd rhan heb unrhyw anableddau. 'Rwy'n chwilio am bobl ifanc rhwng 15 a 17 mlwydd oed. Mae'r llythyr hwn yn cael ei anfon i ysgolion ar hyd a lled Gogledd Cymru. Buaswn yn ddiolchgar iawn pe byddech yn darllen y daflen wybodaeth, a fydd yn cael ei hanfon i rieni'r plant, pe byddech chi'n barod i gymryd rhan.

Mae'r astudiaeth wedi'i chymeradwyo gan Ysgol Seicoleg, Prifysgol Cymru, Bangor, Pwyllgor Moseg Ymchwil a Phwyllgorau Moseg Ymchwil Awdurdod Iechyd Gogledd Cymru (is-bwyllgorau'r Gorllewin, y Canolbarth a'r Dwyrain) a rhoddir eu cyfeiriadau isod.

- | | |
|---|--|
| <p>1. Ysgol Seicoleg, PCB
Pwyllgor Moseg Ymchwil
Adeilad Brigantia
Ffordd y Coleg
BANGOR
Gwynedd
LL57 2DG
Ffôn 01248 351151</p> | <p>11. Pwyllgor Moseg Ymchwil
Awdurdod Iechyd Gogledd Cymru
Uned Cefnogi Rheolaeth Glinigol
Ysbyty Gwynedd
BANGOR
Gwynedd
LL57 2PA
Ffôn 01248 384877</p> |
|---|--|

Bydd Dr Robert Jones, Seicolegydd Clinigol, Ymddiriedolaeth GIG Conwy a Sir Ddinbych, Gwasanaeth Anabledd Dysgu yn goruchwylio'r project.

Pe byddech yn teimlo fod gennych bobl ifanc a fyddai'n addas ac yn barod i gymryd rhan neu os hoffech drafod opsiwn yr ymchwil hwn a threfnu dyddiad i mi ddod i esbonio'r cynnig ymhellach, cysylltwch â mi ar 01745443314.

Diolch i chwi am gymryd amser i ystyried cymryd rhan yn yr astudiaeth hon.

Yn gywir iawn

Katie Haddock
Seicolegydd Clinigol dan Hyfforddiant

Dr Robert Jones
Seicolegydd Clinigol

Appendix 1.4 – Information sheet for parents with children with autism

(Headed Paper)

Study title: A CD-ROM based computer-training package for individuals with autism - a pilot study.

INFORMATION SHEET FOR PARENTS

Your son/daughter is being invited to take part in a research study. Before you consent to me discussing the research with your child it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with friends and relatives. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish your child to take part.

Thank you for reading this information sheet.

What is the purpose of the study?

The present study aims to explore whether individuals with autism have difficulty with social skills i.e. eye-contact when talking to people, standing a reasonable distance away from somebody when talking to them. If they do have difficulty with social skills, the research will assess whether a computer-based teaching package is an appropriate and successful way to teach them these skills.

How have I been contacted?

Permission to approach the school that your child attends was granted by the Hospital Ethics Committee. The school then agreed to be part of this research and suggested that your child may be willing to take-part as they have a diagnosis of autism. The school has kindly sent this letter to you for us; we do not have details of your address.

What do I have to do?

If you agree to your child taking part, one of the researchers involved will contact your child via the school to arrange a convenient time and place to meet with your child (and yourself should you choose to be involved). During this meeting the process will be explained to your child and they will be asked whether they want to participate. If they agree to participate they will be asked to complete 1 questionnaire, which should take between 30-45 minutes. They will then be asked to make another appointment to view some video clips on a computer. The clips will show scenes of good and bad social interactions i.e. a child making too much eye-contact or butting into conversations, your child will be asked to identify which are good and which are bad interactions. This meeting should take about 30 minutes.

Your child will then be assigned to either a group that is involved in the computer-based training package or a control group. If your child is enrolled in the control group, they will be invited to be taught with the computer-based package at a later date should it prove to be successful.

If your child is allocated to the computer-based training package group, they will be asked to complete a 1-2 hour session with me. The computer will show them a number

of clips of social situations and after each clip they will be asked to select one of three options i.e. appropriate interaction, too much eye-contact, or too little eye-contact. Your child will then have feedback on why their answer was correct or incorrect. If the training is successful they will then be asked to review the original clips and grade them again which should take approximately 30 minutes.

All information collected will be treated in strictest confidence and will only be viewed by the researcher and supervisor. Study data will be anonymised so that your child is not identifiable by others outside the study.

Some of the materials, if required, will be provided in Welsh, however the standardised questionnaires will be in the medium of English.

Should you agree to me inviting your child to take part, just return the form and complete the questionnaire attached to this letter.

What if I do not wish my child to take part?

You are under no obligation to allow me to invite your child to take part and are free to choose not to. If you give permission for me to invite your child to take part you will be given this information sheet to keep and be asked to sign the consent form attached to this information sheet. Please also be aware, should you decide to allow your child to take part you are still free to withdraw *at any time* and without giving a reason. Your child's educational placement will not be affected in any way should you choose not to be part of this study or to withdraw at any time.

Who benefits from this project and how?

Children with autism can find it difficult to understand social interactions. The inclusion of your child in this project will allow us to assess some of the problem areas and potentially assess whether the computer-based training package is a useful method to teach people with autism. If the training works, the package could help a lot of children with autism who are facing social difficulties.

- If you have any further questions please contact me, Katie Haddock, at the Brigantia building, 43 College Road, Bangor, Gwynedd LL57 2DG (01745443314).
- If you have any complaints about how this study is conducted please address these to:
 - i) Professor Fergus Lowe, Head of School, School of Psychology, University of Wales, Bangor, LL57 2DG.
 - ii) Mr Keith Thomson, Chief Executive, North West Wales NHS Trust, Ysbyty Gwynedd Hospital, Bangor, Gwynedd, LL57 2PW.

THANK YOU FOR TAKING TIME TO READ THIS LEAFLET.

RESEARCH CONSENT FORM FOR PARENTS

The present study aims to explore whether individuals with autism have difficulty with social skills. If they do have difficulty with social skills, the research will assess whether a computer-based teaching package is an appropriate and successful way to teach them these skills.

Please complete the following and delete as necessary:

- 1) Have you read the participant information sheet? YES/NO
- 2) Have you had an opportunity to ask questions and discuss this study? YES/NO
- 3) Have you received satisfactory answers to all of your questions? YES/NO
- 4) Have you received enough information about this study? YES/NO
- 5) Do you understand that you are free to withdraw your child from this study -
 - ..at any time
 - ..without giving a reason for withdrawing

YES/NO

Signed.....

Date.....

Name in block letters.....

Address and/or contact number.....

- If you have any further questions, please contact me, Katie Haddock, at Brigantia building, 43 College Road, Bangor Gwynedd, LL57 2DG (01745443314).

If you have any complaints about how this study is conducted please address these to:

- i. Professor CF Lowe, Head of School, School of Psychology, University of Wales, Bangor, LL57 2DG.
- ii. Chairperson, North Wales Health Authority Research Ethics Committee (West), c/o Miss Liz James, Administrator, Room 1/178, Ysbyty Gwynedd Hospital, Bangor, Gwynedd, LL57 2PW.

* Autism behavior checklist attached

Teitl yr Astudiaeth: Pecyn hyfforddi cyfrifiadurol CD-ROM i unigolion gydag awtistiaeth - astudiaeth beilot.

TAFLEN WYBODAETH I RIENI

Gwahoddir eich mab/merch i gymryd rhan mewn astudiaeth ymchwil. Cyn ichi gydsynio i mi drafod yr ymchwil gyda'ch plentyn mae'n bwysig i chi ddeall pam fod yr ymchwil yn cael ei wneud a beth fydd yn ei olygu. Cymerwch amser os gwelwch yn dda i ddarllen yr wybodaeth ganlynol yn ofalus ac i'w drafod gyda'ch teulu a'ch ffrindiau. Gofynnwch i ni os oes unrhyw beth nad ydych yn ei ddeall neu yr hoffech fwy o wybodaeth amdano. Cymerwch amser i benderfynu a ydych am i'ch plentyn gymryd rhan ai peidio.

Diolch i chi am ddarllen y daflen wybodaeth hon.

Beth yw pwrpas yr astudiaeth?

Nod yr astudiaeth bresennol yw ymchwilio a yw unigolion gydag awtistiaeth yn cael trafferthion gyda sgiliau cymdeithasol h.y edrych ar bobl wrth siarad â hwy, sefyll ar bellter rhesymol oddi wrth rywun wrth siarad. Os cânt drafferth gyda sgiliau cymdeithasol, bydd yr ymchwil wedyn yn asesu a yw pecyn dysgu ar sail rhaglen gyfrifiadurol yn ffordd briodol a llwyddianus o ddysgu'r sgiliau hyn iddynt.

Sut y cysylltwyd gyda mi?

Cafwyd caniatâd i fynd at ysgol eich plentyn gan Bwyllgor Moeseg yr Ysbyty. Mae'ch ysgol wedi cytuno wedyn i fod yn rhan o'r ymchwil hwn, a dywedasant efallai y byddai'ch plentyn chi'n barod i gymryd rhan yn yr ymchwil gan fod ganddo ddeagnosis o awtistiaeth. Mae'r ysgol yn garedig iawn wedi anfon y llythyr hwn i chwi drosom ni; does gennym ddim manylion am eich cyfeiriad.

Beth sy'n rhaid i mi ei wneud?

Os ydych yn cytuno i'ch plentyn gymryd rhan, bydd un o'r ymchwilwyr yn cysylltu gyda'ch plentyn trwy'r ysgol i drefnu amser a lle cyfleus i gyfarfod â'ch plentyn (a chwithau os ydych yn dewis ymwneud). Yn y cyfarfod hwn bydd y broses yn cael ei hesbonio wrth eich plentyn a bydd gofyn iddo a ydyw am gymryd rhan. Os yw'n cytuno gofynnir iddo gwblhau un holiadur, a ddylai gymryd rhwng 30 a 45 munud. Wedyn gofynnir am apwyntiad arall i edrych ar rai clips fideo ar y cyfrifiadur. Bydd y clips yn dangos golygfeydd o ymadweithiau cymdeithasol da a drwg h.y plentyn yn gwneud gormod o gyswllt llygad neu'n tarfu ar sgysiau, a gofynnir i'ch plentyn ddweud pa rai sy'n arferion da a pha rai sy'n ddrwg. Fe ddylai'r cyfarfod hwn gymryd tua 30 munud.

Bydd eich plentyn wedyn yn cael ei ddynodi i unai grwp sy'n ymwneud mewn pecyn hyfforddi cyfrifiadurol neu grwp rheoli. Os cofrestrir eich plentyn i'r grwp rheoli, fe'u gwahoddir i gael eu dysgu gyda phe cyn cyfrifiadurol yn ddiweddarach os yw'n profi i fod yn llwyddianus.

Os caiff eich plentyn ei ddynodi i grwp pecyn hyfforddi cyfrifiadurol, gofynnir iddo gwblhau sesiwn 1-2 awr gyda mi. Bydd y cyfrifiadur yn dangos iddynt nifer o glips o sefyllfaoedd cymdeithasol ac yn dilyn pob clip gofynnir iddynt ddewis un o dri opsiwn h.y ymadwaith priodol, gormod o gyswllt llygad neu dim digon o gyswllt llygad. Bydd eich plentyn wedyn yn cael adborth pam fod eu hateb yn gywir neu'n anghywir. Os yw'r hyfforddiant yn llwyddiannus gofynnir iddynt wedyn ail-edrych ar y clips gwreiddiol a'u graddoli eto, a ddylai gymryd oddeutu 30 munud.

Bydd pob gwybodaeth a gesglir yn cael ei gadw'n gyfrinachol, dim ond yr ymchwilydd a'i goruchwylydd fydd yn edrych arno. Ni fydd enw ar wybodaeth yr astudiaeth fel na ellir adnabod eich plentyn gan eraill y tu allan i'r astudiaeth.

Bydd rhywfaint o'r deunydd, os oes angen, ar gael yn Gymraeg . Fodd bynnag bydd yr holiaduron safonol yn Saesneg.

Pe byddech yn cytuno i mi wahodd eich plentyn i gymryd rhan, dychwelwch y ffurflen a chwblhau'r holiadur sydd ynghlwm wrth y llythyr hwn.

Beth os nad wyf fi eisiau i'm plentyn gymryd rhan?

Does dim rheidrwydd amoch i adael imi wahodd eich plentyn i gymryd rhan os nad ydych eisiau ac yr ydych yn rhydd i ddewis peidio. Os rhoddwch eich caniatad imi wahodd eich plentyn i gymryd rhan rhoddir y daflen wybodaeth hon ichi i'w chadw a gofynnir i chwi lenwi'r ffurflen gydsynio sydd ynghlwm wrth y daflen wybodaeth hon. Byddwch yn ymwybodol hefyd, pe byddwch yn penderfynu gadael i'ch plentyn gymryd rhan yr ydych yn dal i fod yn rhydd i dynnu'n ôl *ar unrhyw adeg* a heb roi rheswm. Ni fydd lleoliad addysgol eich plentyn yn cael ei effeithio o gwbl pe byddech yn penderfynu peidio bod yn rhan o'r astudiaeth hon neu'n tynnu'n ôl ar unrhyw adeg.

Pwy sy'n cael budd o'r project hwn a sut?

Gall plant gydag awtistiaeth ei chael hi'n anodd i ddeall ymadweithiau cymdeithasol. Bydd cynnwys eich plentyn yn y project hwn yn ein galluogi i asesu rhai o'r manau a gânt yn fwyaf anodd ac asesu'r posibilrwydd fod pecyn hyfforddi cyfrifiadurol yn ddull defnyddiol o ddysgu pobl gydag awtistiaeth. Os yw'r hyfforddiant yn gweithio, gallai'r pecyn helpu llawer o blant gydag awtistiaeth sy'n wynebu trafferthion cymdeithasol.

- Os oes gennych unrhyw gwestiynau pellach cysylltwch â mi, Katie Haddock, yn Adeilad Brigantia, 43 Ffordd y Coleg, Bangor, Gwynedd LL57 2DG neu ffoniwch fi ar y rhif 01745 443314.

- Os oes gennych chi unrhyw gwynion am yr astudiaeth hon cysylltwch â:
 - i. Yr Athro Fergus Lowe, Pennaeth Ysgol
Yr Ysgol Seicoleg
Prifysgol Cymru, Bangor
LL57 2DG.
 - ii. Mr Keith Thomson, Prif Weithredwr
Ymddiriedolaeth GIG Gogledd Orllewin Cymru
Ysbyty Gwynedd
Bangor
Gwynedd LL57 2PW

**DIOLCH I CHWI AM GYMRYD AMSER I DDARLLEN Y DAFLEN
HON.**

FFURFLEN CYDSYNIO YMCHWIL I RIENI

Nod yr astudiaeth hon yw ymchwilio p'un ai fod unigolion gydag awtistiaeth yn cael trafferth gyda sgiliau cymdeithasol. Os ydynt yn cael trafferth gyda sgiliau cymdeithasol, bydd yr ymchwil yn asesu p'un ai fod pecyn dysgu cyfrifiadurol yn ffordd briodol a llwyddiannus o ddysgu'r sgiliau hyn iddynt.

Cwblhewch y canlynol a dileu fel bo'n briodol os gwelwch yn dda:

- 1) Ydych chi wedi darllen y daflen wybodaeth i rai sy'n cymryd rhan?
DO/NADDO
- 2) Ydych chi wedi cael cyfle i ofyn cwestiynau ac i drafod yr astudiaeth?
DO/NADDO
- 3) Ydych chi wedi derbyn atebion boddhaol i'ch holl gwestiynau?
DO/NADDO
- 4) Ydych chi wedi derbyn digon o wybodaeth am yr astudiaeth hon?
DO/NADDO
- 5) Ydych chi'n deall eich bod yn rhydd i dynnu'ch plentyn yn ôl o'r astudiaeth hon -
 - ar unrhyw adeg
 - heb roi rheswm dros dynnu'n ôl
 YDW/NAG YDW

Llofnodwyd:

Dyddiad:

Enw mewn llythrennau bras:

Cyfeiriad a/neu rif cysylltu:

- Os oes gennych unrhyw gwestiynau pellach cysylltwch â mi, Katie Haddock, yn Adeilad Brigantia, 43 Ffordd y Coleg, Bangor, Gwynedd LL57 2DG neu ffoniwch fi ar y rhif 01745 443314.
- Os oes gennych chi unrhyw gwynion am yr astudiaeth hon cyfeiriwch y rhain at:
 - i. Yr Athro F Lowe, Pennaeth Ysgol, Yr Ysgol Seicoleg, Prifysgol Cymru, Bangor, LL57 2DG.
 - ii. Cadeirydd, Pwyllgor Moeseg Ymchwil Awdurdod Iechyd Gogledd Cymru (Gorllewin), d/o Miss Liz James, Gweinyddwraig, Ystafell 1/178, Ysbyty Gwynedd, Bangor, Gwynedd LL57 2PW

Appendix 1.5 – Information sheet for parents with children without autism

(Headed paper)

Study title: A CD-ROM based computer-training package for individuals with autism - a pilot study.

INFORMATION SHEET FOR PARENTS

Your son/daughter is being invited to take part in a research study. Before you consent to me discussing the research with your child it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with friends and relatives. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish your child to take part.

Thank you for reading this information sheet.

What is the purpose of the study?

The present study aims to explore social skills in adolescents i.e. eye-contact when talking to people, standing a reasonable distance away from somebody when talking to them. The study will compare adolescents who are unlikely to have difficulty with social skills (i.e. individuals with no disability or individuals with a mild learning disability) with adolescents who are likely to have difficulty with social skills (i.e. individuals with autism). If some adolescents do have difficulty with social skills, the research will assess whether a computer-based teaching package is an appropriate and successful way to teach them these skills.

How have I been contacted?

Permission to approach the school that your child attends was granted by the Hospital Ethics Committee. The school then agreed to be part of this research and suggested that your child may be willing to take-part in the comparison group (as they do not have difficulty with social skills). The school has kindly sent this letter to you for us; we do not have details of your address.

What do I have to do?

If you agree to your child taking part, one of the researchers involved will contact your child via the school to arrange a convenient time and place to meet with your child (and yourself should you choose to be involved). During this meeting the process will be explained to your child and they will be asked whether they want to participate. If they agree to participate they will be asked to complete 1 questionnaire, which should take between 30-45 minutes. They will then be asked to make another appointment to view some video clips on a computer. The clips will show scenes of good and bad social interactions i.e. a child making too much eye-contact or butting in to conversations, your child will be asked to identify which are good and which are bad. This meeting should take about 30 minutes.

All information collected will be treated in strictest confidence and will only be viewed by the researcher and supervisor. Study data will be anonymised so that your child is not identifiable.

Some of the materials, if required, will be provided in Welsh, however the standardised questionnaires will be in the medium of English.

Should you agree to your child taking part, just return the slip at the bottom of the page and complete the questionnaire attached to this letter.

What if I do not wish my child to take part?

You are under no obligation to allow me to invite your child to take part and are free to choose not to. If you give permission for me to invite your child to take part you will be given this information sheet to keep and be asked to sign the consent form attached to this information sheet. Please also be aware, should you decide to allow your child to take part you are still free to withdraw *at any time* and without giving a reason. Your child's educational placement will not be affected in any way should you choose not to be part of the study or to withdraw at any time.

Who benefits from this project and how?

Some adolescents with autism can find it difficult to understand social interactions. The inclusion of your child in this project will allow us to assess the difference between children who are good at social skills and those who have difficulty. Should the CD-ROM be accepted as a useful method to teach people with autism social skills, the teaching could potentially help a lot of children facing this difficulty.

- If you have any further questions please contact me, Katie Haddock, at the Brigantia building, 43 College Road, Bangor, Gwynedd LL57 2DG (01745443314).
- If you have any complaints about how this study is conducted please address these to:
 - i. Professor Fergus Lowe, Head of School, School of Psychology, University of Wales, Bangor, LL57 2DG.
 - ii. Mr Keith Thomson, Chief Executive, North West Wales NHS Trust, Ysbyty Gwynedd Hospital, Bangor, Gwynedd, LL57 2PW.

THANK YOU FOR TAKING TIME TO READ THIS LEAFLET.

RESEARCH CONSENT FORM FOR PARENTS

The present study aims to explore whether individuals with autism have difficulty with social skills. If they do have difficulty with social skills, the research will assess whether a computer-based teaching package is an appropriate and successful way to teach them these skills.

Please complete the following and delete as necessary:

- 2) Have you read the participant information sheet? YES/NO
- 2) Have you had an opportunity to ask questions and discuss this study? YES/NO
- 3) Have you received satisfactory answers to all of your questions? YES/NO
- 4) Have you received enough information about this study? YES/NO
- 5) Do you understand that you are free to withdraw your child from this study -
 - ..at any time
 - ..without giving a reason for withdrawing

YES/NO

Signed.....

Date.....

Name in block letters.....

Address and/or contact number.....

- If you have any further questions, please contact me, Katie Haddock, at Brigantia building, 43 College Road, Bangor Gwynedd, LL57 2DG (01745443314).

If you have any complaints about how this study is conducted please address these to:

- i. Professor CF Lowe, Head of School, School of Psychology, University of Wales, Bangor, LL57 2DG.
- ii. Chairperson, North Wales Health Authority Research Ethics Committee (West), c/o Miss Liz James, Administrator, Room 1/178, Ysbyty Gwynedd Hospital, Bangor, Gwynedd, LL57 2PW.

*** Autism behavior checklist attached**

Teitl yr Astudiaeth: Pecyn hyfforddi cyfrifiadurol CD-ROM i unigolion gydag awtistiaeth - astudiaeth beilot.

TAFLEN WYBODAETH I RIENI

Gwahoddir eich mab/merch i gymryd rhan mewn astudiaeth ymchwil. Cyn ichi gydsynio i mi drafod yr ymchwil gyda'ch plentyn mae'n bwysig i chi ddeall pam fod yr ymchwil yn cael ei wneud a beth fydd yn ei olygu. Cymerwch amser os gwelwch yn dda i ddarllen yr wybodaeth ganlynol yn ofalus ac i'wdrafod gyda'ch teulu a'ch ffrindiau. Gofynnwch i ni os oes unrhyw beth nad ydych yn ei ddeall neu yr hoffech fwy o wybodaeth amdano. Cymerwch amser i benderfynu a ydych am i'ch plentyn gymryd rhan ai peidio.

Diolch i chi am ddarllen y daflen wybodaeth hon.

Beth yw pwrpas yr astudiaeth?

Nod yr astudiaeth bresennol yw ymchwilio i sgiliau cymdeithasol mewn rhai yn eu glaslencyndod h.y cyswllt llygad wrth siarad gyda phobl, sefyll bellter rhesymol oddi wrth rywun wrth siarad gyda hwy. Bydd yr astudiaeth yn cymharu pobl ifanc nad ydynt yn debyg o gael trafferthion gyda sgiliau cymdeithasol (h.y unigolion heb unrhyw anabledd neu unigolion gydag anabledd dysgu ysgafn) gyda rhai pobl ifanc sy'n debygol o gael trafferth gyda sgiliau cymdeithaso (h.y unigolion gydag awtistiaeth). Os oes rhai pobl ifanc yn cael trafferth gyda sgiliau cymdeithasol, bydd yr ymchwil yn asesu a yw pecyn dysgu ar sail rhaglen gyfrifiadurol yn ffordd briodol a llwyddianus o ddysgu'r sgiliau hyn iddynt.

Sut y cysylltwyd gyda mi?

Cafwyd caniatâd i fynd at ysgol eich plentyn gan Bwyllgor Moeseg yr Ysbytyamarige. Mae'ch ysgol wedi cytuno wedyn i fod yn rhan o'r ymchwil hwn, a dywedasant efallai y byddai'ch plentyn chi'n barod i gymryd rhan yn y grwp cymharu (gan nad ydyw yn cael anhawster gyda sgiliau cymdeithasol). Mae'r ysgol yn garedig iawn wedi anfon y llythyr hwn i chi drosom ni; does gennym ddim manylion am eich cyfeiriad.

Beth sy'n rhaid i mi ei wneud?

Os ydych yn cytuno i'ch plentyn gymryd rhan, bydd un o'r ymchwilwyr yn cysylltu gyda'ch plentyn trwy'r ysgol i drefnu amser a lle cyfleus i gyfarfod â'ch plentyn (a chwithau os ydych yn dewis ymwneud). Yn y cyfarfod hwn bydd y broses yn cael ei hesbonio wrth eich plentyn a bydd gofyn iddo a ydyw am gymryd rhan. Os yw'n cytuno gofynnir iddo gwblhau un holiadur, a ddylai gymryd rhwng 30 a 45 munud. Wedyn gofynnir am apwyntiad arall i edrych ar rai clips fideo ar y cyfrifiadur. Bydd y clips yn dangos golygfeydd o ymadweithiau cymdeithasol da a drwg h.y plentyn yn gwneud gormod o gyswllt llygad neu'n tarfu ar sgysiau, a gofynnir i'ch plentyn ddweud pa rai sy'n arferion da a pha rai sy'n ddrwg. Fe ddylai'r cyfarfod hwn gymryd tua 30 munud.

Bydd pob gwybodaeth a gesglir yn cael ei gadw'n gyfrinachol, dim ond yr ymchwilydd a'i goruchwylydd fydd yn edrych arno. Ni fydd enw ar wybodaeth yr astudiaeth fel na ellir adnabod eich plentyn gan eraill y tu allan i'r astudiaeth.

Bydd rhywfaint o'r deunydd, os oes angen, ar gael yn Gymraeg . Fodd bynnag bydd yr holiaduron safonol yn Saesneg.

Pe byddech yn cytuno i mi wahodd eich plentyn i gymryd rhan, dychwelwch y ffurflen a chwblhau'r holiadur sydd ynghlwm wrth y llythyr hwn.

Beth os nad wyf fi eisiau i'm plentyn gymryd rhan?

Does dim rheidrwydd arnoch i adael imi wahodd eich plentyn i gymryd rhan os nad ydych eisiau ac yr ydych yn rhydd i ddewis peidio. Os rhoddwch eich caniatad imi wahodd eich plentyn i gymryd rhan rhoddir y daflen wybodaeth hon ichi i'w chadw a gofynnir i chwi lenwi'r ffurflen gydsynio sydd ynghlwm wrth y daflen wybodaeth hon. Byddwch yn ymwybodol hefyd, pe byddwch yn penderfynu gadael i'ch plentyn gymryd rhan yr ydych yn dal i fod yn rhydd i dynnu'n ôl *ar unrhyw adeg* a heb roi rheswm. Ni fydd lleoliad addysgol eich plentyn yn cael ei effeithio o gwbl pe byddech yn penderfynu peidio bod yn rhan o'r astudiaeth hon neu'n tynnu'n ôl ar unrhyw adeg.

Pwy sy'n cael budd o'r project hwn a sut?

Gall rhai pobl ifanc gydag awtistiaeth ei chael hi'n anodd i ddeall sefyllfaoedd cymdeithasol. Bydd cynnwys eich plentyn yn y project hwn yn ein galluogi i asesu'r gwahaniaeth rhwng plant sy'n dda mewn sgiliau cymdeithasol a'r rhai sy'n cael trafferth. Pe byddai'r CD-ROM yn cael ei dderbyn fel dull defnyddiol o ddysgu sgiliau cymdeithasol i bobl gydag awtistiaeth, gallai'r pecyn helpu llawer o blant gydag awtistiaeth sy'n wynebu trafferthion cymdeithasol.

- Os oes gennych unrhyw gwestiynau pellach cysylltwch â mi, Katie Haddock, yn Adeilad Brigantia, 43 Ffordd y Coleg, Bangor, Gwynedd LL57 2DG neu ffoniwch fi ar y rhif 01745 443314.
- Os oes gennych chi unrhyw gwynion am yr astudiaeth hon cysylltwch â:
 - iii. Yr Athro Fergus Lowe, Pennaeth Ysgol
Yr Ysgol Seicoleg
Prifysgol Cymru, Bangor
LL57 2DG.
 - iv. Mr Keith Thomson, Prif Weithredwr
Ymddiriedolaeth GIG Gogledd Orllewin Cymru
Ysbyty Gwynedd
Bangor
Gwynedd LL57 2PW

DIOLCH I CHWI AM GYMRYD AMSER I DDARLLEN Y DAFLEN HON.

FFURFLEN CYDSYNIO YMCHWIL I RIENI

Nod yr astudiaeth hon yw ymchwilio p'un ai fod unigolion gydag awtistiaeth yn cael trafferth gyda sgiliau cymdeithasol. Os ydynt yn cael trafferth gyda sgiliau cymdeithasol, bydd yr ymchwil yn asesu p'un ai fod pecyn dysgu cyfrifiadurol yn ffordd briodol a llwyddiannus o ddysgu'r sgiliau hyn iddynt.

Cwblhewch y canlynol a dileu fel bo'n briodol os gwelwch yn dda:

- 1) Ydych chi wedi darllen y daflen wybodaeth i rai sy'n cymryd rhan?
DO/NADDO
- 2) Ydych chi wedi cael cyfle i ofyn cwestiynau ac i drafod yr astudiaeth?
DO/NADDO
- 3) Ydych chi wedi derbyn atebion boddhaol i'ch holl gwestiynau?
DO/NADDO
- 4) Ydych chi wedi derbyn digon o wybodaeth am yr astudiaeth hon?
DO/NADDO
- 6) Ydych chi'n deall eich bod yn rhydd i dynnu'ch plentyn yn ôl o'r astudiaeth hon -
 - ar unrhyw adeg
 - heb roi rheswm dros dynnu'n ôl
 YDW/NAG YDW

Llofnodwyd:

Dyddiad:

Enw mewn llythrennau bras:

Cyfeiriad a/neu rif cysylltu:

- Os oes gennych unrhyw gwestiynau pellach cysylltwch â mi, Katie Haddock, yn Adeilad Brigantia, 43 Ffordd y Coleg, Bangor, Gwynedd LL57 2DG neu ffoniwch fi ar y rhif 01745 443314.
- Os oes gennych chi unrhyw gwynion am yr astudiaeth hon cyfeiriwch y rhain at:
 - i. Yr Athro F Lowe, Pennaeth Ysgol, Yr Ysgol Seicoleg, Prifysgol Cymru, Bangor, LL57 2DG.
 - ii. Cadeirydd, Pwyllgor Moeseg Ymchwil Awdurdod Iechyd Gogledd Cymru (Gorllewin), d/o Miss Liz James, Gweinyddwraig, Ystafell 1/178, Ysbyty Gwynedd, Bangor, Gwynedd LL57 2PW

Appendix 1.6 – Information sheet for children with autism (intervention group)

(Headed paper)

Study title: A CD-ROM based computer-training package for individuals with autism - a pilot study.

INFORMATION SHEET

You have been invited to take part in a study. Before you choose whether you want to take part I will explain why we are doing the research and what we would like you to do. Please take time to read this sheet with me. You can talk about anything we say to your friends and family. Ask us if there is anything that you don't understand or that you would like more information about. Take time to choose whether or not you want to take part.

Thank you for reading this sheet.

What is the study?

We want to see whether children with autism have problems with social skills i.e. knowing when to listen and knowing how to make eye-contact with someone when talking to them. If this is a

problem, we would like to try and teach you how to improve your skills by using a programme on a computer.

Why me?

Your school has agreed to be part of this study, and they said that you might want to help. I have written to your parents/guardian and they have said it is ok for me to ask you whether you want to take part.

What do I have to do?

If you agree to take part, you will be asked to complete 1 questionnaire, which should take between 30-45 minutes. After this, I will come back another day and ask you to look at some video clips on the computer. The clips will show people talking in a café and a clothes shop. I would like you to tell me whether they are doing things right or getting things wrong. This meeting should take about 30 minutes.

After this I would like you to meet with me for about an hour to look at the video clips again to try and work out what's right and what's wrong. When we have finished the training you will be asked to go through the clips that we have trained with and some new clips and say what's right and wrong. This should take about 30 minutes.

All of the information will be kept private, only myself and my supervisor will look at it. Your name will not be on the questionnaire.

This information sheet and the consent form will be written in Welsh and English. However the questionnaires will be written in English.

What if I do not want to take part?

You don't have to take part if you don't want to. If you do want to you will be given this information sheet to keep and asked to sign the consent form at the bottom of the page. Your parent/guardian can sign it for you if you find it difficult to write. You

can stop taking part in the study at any time and you don't need to tell us why.

How will this study help people?

Children with autism can find it extremely difficult to understand about social situations. This study will show us some of the things that you may find more difficult. The study will also see whether training on a computer can help you to learn these skills. If the training works, the package could help a lot of children with autism.

- If you have any further questions please contact me, Katie Haddock, at the Brigantia building, 43 College Road, Bangor, Gwynedd LL57 2DG or telephone me on 01745443314.
- If you have any complaints about how this study is conducted please address these to:
 - i. Professor Fergus Lowe, Head of School,
School of Psychology,
University of Wales, Bangor, LL57 2DG.

- ii. Mr Keith Thomson, Chief Executive,
North West Wales NHS Trust,
Ysbyty Gwynedd Hospital, Bangor,
Gwynedd,
LL57 2PW.

**THANK YOU FOR TAKING TIME TO READ THIS
LEAFLET.**

Teitl yr astudiaeth: Pecyn hyfforddi-cyfrifiadurol CD ROM ar gyfer unigolion gydag awtistiaeth - astudiaeth beilot.

TAFLEN WYBODAETH

Gwahoddwyd chwi i gymryd rhan mewn astudiaeth. Cyn eich bod yn penderfynu a ydych am gymryd rhan, fe esboniaf pam ein bod yn gwneud yr ymchwil a beth yr ydym eisiau gennych chi.

Cymerwch amser i ddarllen y daflen hon gyda mi os gwelwch yn dda. Gallwch sôn wrth eich teulu a'ch ffrindiau am unrhyw beth a ddywedwn. Gofynnwch i ni os oes unrhyw beth nad ydych chi'n ei ddeall neu yr hoffech gael mwy o wybodaeth arno. Cymerwch amser i ddewis a ydych am gymryd rhan ai peidio. Diolch am ddarllen y daflen hon.

Beth yw'r astudiaeth?

Yr ydym eisiau gwybod a yw plant ag awtistiaeth â phroblemau gyda sgiliau cymdeithasol h.y gwybod pryd i wrando a gwybod sut i wneud cyswllt llygad gyda rhywun wrth siarad gyda hwy. Os

oes problem gyda hyn, fe hoffem eich dysgu sut i wella'ch sgiliau gan ddefnyddio rhaglen ar gyfrifiadur.

Pam fi?

Mae'ch ysgol chwi wedi cytuno i fod yn rhan o'r astudiaeth, a dywedasant y gallech chi fod eisiau helpu. Yr wyf wedi ysgrifennu at eich rhieni/gwarcheidwad a ddywedodd ei bod yn iawn imi ofyn i chwi a fuasech am gymryd rhan.

Beth sy'n rhaid i mi ei wneud i gymryd rhan?

Os ydych yn cytuno i gymryd rhan gofynnir i chwi gwblhau holiadur, a ddylai gymryd rhwng 30 a 45 munud. Wedyn, fe ddof fi'n ôl ar ddiwrnod arall a gofyn i chwi edrych ar glips fideo ar gyfrifiadur. Bydd y clips yn dangos pobl yn siarad mewn caffi a siop ddillad. Fe hoffwn i i chwi ddweud wrthyf a ydynt yn gwneud pethau'n iawn neu'n gwneud pethau'n anghywir. Fe ddylai'r cyfarfod hwn gymryd tua 30 munud.

Wedi hyn, fe hoffwn i chi gyfarfod gyda mi am tua awr i edrych ar glips fideo eto i geisio gweithio allan beth sy'n iawn a beth sydd ddim. Pan fyddwn wedi gorffen yr hyfforddi fe ofynnir i chwi fynd trwy'r clips yr ydym wedi hyfforddi gyda hwy a rhai clips newydd a dweud beth sy'n iawn a beth sydd ddim. Fe ddylai hyn gymryd tua 30 munud.

Bydd yr holl wybodaeth yn cael ei gadw'n breifat, a dim ond y fi a'm goruchwyliwr fydd yn edrych arno. Ni fydd eich enw ar yr holiadur.

Bydd y daflen wybodaeth a'r ffurflen gydsynio yn cael eu hysgrifennu yn Gymraeg ac yn Saesneg. Fodd bynnag dim ond yn Saesneg y bydd yr holiaduron.

Beth os nad wyf fi eisiau cymryd rhan?

Does dim rhaid ichi gymryd rhan os nad ydych eisiau. Os ydych am gymryd rhan fe roddir y daflen wybodaeth hon i chwi i'w chadw a gofynnir i chwi lenwi'r ffurflen gydsynio ar waelod y

ddalen. Gall eich rhiant/warcheidwad ei lofnodi drosoch os ydych chi'n cael trafferth. Gallwch stopio cymryd rhan yn yr astudiaeth ar unrhyw amser, a does dim rhaid ichi ddweud pam wrthym.

Sut fydd yr astudiaeth hon yn helpu pobl?

Gall rhai plant gydag awtistiaeth ei chael hi'n arbennig o anodd i ddeall am sefyllfaoedd cymdeithasol. Bydd yr astudiaeth hon yn dangos i ni rai o'r pethau a gânt hwy'n fwyaf anodd. Bydd yr astudiaeth hefyd yn gweld sut y gall hyfforddi ar gyfrifiadur eich helpu i ddysgu'r sgiliau hyn. Os yw'r hyfforddiant yn gweithio, gall y pecyn helpu llawer o blant gydag awtistiaeth.

- Os oes gennych unrhyw gwestiynau pellach cysylltwch â mi, Katie Haddock, yn Adeilad Brigantia, 43 Ffordd y Coleg, Bangor, Gwynedd LL57 2DG neu ffoniwch fi ar y rhif 01745 443314.

- Os oes gennych chi unrhyw gwynion am yr astudiaeth hon cysylltwch â:

v. Yr Athro Fergus Lowe, Pennaeth Ysgol

Yr Ysgol Seicoleg

Prifysgol Cymru, Bangor

LL57 2DG.

vi. Mr Keith Thomson, Prif Weithredwr

Ymddiriedolaeth GIG Gogledd Orllewin Cymru

Ysbyty Gwynedd

Bangor

Gwynedd LL57 2PW

**DIOLCH I CHWI AM GYMRYD AMSER I DDARLLEN Y
DAFLEN HON.**

Appendix 1.7 – Information sheet for children with autism (control group)

(Headed paper)

Study title: A CD-ROM based computer-training package for individuals with autism - a pilot study.

INFORMATION SHEET

You have been invited to take part in a study. Before you choose whether to take part, I will explain why we are doing the study and what we want you to do. Please take time to read this sheet with me. You can talk about anything we say to your friends and family. Ask us if there is anything that you don't understand or that you would like more information about. Take time to decide whether or not you want to take part.

Thank you for reading this sheet.

What is the study?

We want to see whether children with autism have problems with social skills i.e. knowing when to listen and knowing when to make eye-contact with someone when talking to them. If this is a

problem, the research would then like to teach them how to improve these skills by using a programme on a computer.

Why me?

Your school has agreed to be part of this study, and they said that you might want to help. I have written to your parents/guardian and they said it was ok for me to ask you whether you want to take part.

What do I have to do?

If you agree to take part, you will be asked to complete 1 questionnaire, which should take between 30-45 minutes. After this, I will come back another day and ask you to look at some video clips on the computer. The clips will show people talking in a café and a clothes shop. I would like you to tell me whether they are doing things right or getting things wrong. This meeting should take about 30 minutes.

After this I will come back in a few weeks and ask you to do exactly the same thing again.

All of the information will be kept private, only myself and my supervisor will look at it. Your name will not be on the questionnaire.

This information sheet and the consent form will be written in Welsh and English. However the questionnaires will be written in English.

What if I do not wish to take part?

You don't have to take part if you don't want to. If you do want to you will be given this information sheet to keep and asked to sign the consent form at the bottom of the page. Your parent/guardian can sign it for you if you find it difficult to write. You can stop taking part in the study at any time and you don't need to tell us why.

How will this study help people?

Children with autism can find it difficult to understand about social situations. This study will show us some of the things that they find more difficult. The study will also see whether training on a computer can help them to learn these skills. If the study is helpful, you will be asked whether you would like to try the training on the computer. This study might help a lot of children with autism.

- If you have any further questions please contact me, Katie Haddock, at the Brigantia building, 43 College Road, Bangor, Gwynedd LL57 2DG or telephone me on 01745443314.
- If you have any complaints about this study please contact:
 - i. Professor Fergus Lowe, Head of School,
School of Psychology,
University of Wales, Bangor,
LL57 2DG.

ii. Mr Keith Thomson, Chief Executive,
North West Wales NHS Trust,
Ysbyty Gwynedd Hospital, Bangor,
Gwynedd,
LL57 2PW.

**THANK YOU FOR TAKING TIME TO READ THIS
LEAFLET.**

Teitl yr astudiaeth: Pecyn hyfforddi-cyfrifiadurol CD ROM ar gyfer unigolion gydag awtistiaeth - astudiaeth beilot.

TAFLEN WYBODAETH

Gwahoddwyd chwi i gymryd rhan mewn astudiaeth. Cyn eich bod yn penderfynu a ydych am gymryd rhan, fe esboniaf pam ein bod yn gwneud yr astudiaeth a beth yr ydym eisiau gennych chi.

Cymerwch amser i ddarllen y daflen hon gyda mi os gwelwch yn dda. Gallwch sôn wrth eich teulu a'ch ffrindiau am unrhyw beth a ddywedwn. Gofynnwch i ni os oes unrhyw beth nad ydych chi'n ei ddeall neu yr hoffech gael mwy o wybodaeth arno. Cymerwch amser i benderfynu a ydych am gymryd rhan ai peidio. Diolch am ddarllen y daflen hon.

Beth yw'r astudiaeth?

Yr ydym eisiau gwybod a yw plant gydag awtistiaeth â phroblemau gyda sgiliau cymdeithasol h.y gwybod pryd i wrando a gwybod sut i wneud cyswllt llygad gyda rhywun wrth siarad gyda hwy. Os oes problem gyda hyn, fe hoffai'r ymchwil wedyn

eu dysgu sut i wella'r sgiliau hyn gan ddefnyddio rhaglen ar gyfrifiadur.

Pam fi?

Mae'ch ysgol chwi wedi cytuno i fod yn rhan o'r astudiaeth, a dywedasant y gallech chi fod eisiau helpu. Yr wyf wedi ysgrifennu at eich rhieni/gwarcheidwad a ddywedodd ei bod yn iawn imi ofyn i chwi a fuasech am gymryd rhan.

Beth sy'n rhaid i mi ei wneud i gymryd rhan?

Os ydych yn cytuno i gymryd rhan gofynnir i chwi gwblhau holiadur, a ddylai gymryd rhwng 30 a 45 munud. Wedyn, fe ddof fi'n ôl ar ddiwrnod arall a gofyn i chwi edrych ar glips fideo ar gyfrifiadur. Bydd y clips yn dangos pobl yn siarad mewn caffi a siop ddillad. Fe hoffwn i i chwi ddweud wrthyf a ydynt yn gwneud pethau'n iawn neu'n gwneud pethau'n anghywir. Fe ddylai'r cyfarfod hwn gymryd tua 30 munud.

Wedi hyn byddaf fi'n dod yn ôl mewn rhai wythnosau ac yn gofyn i chwi wneud yn union yr un peth eto.

Bydd yr holl wybodaeth a roddwch i mi yn cael ei gadw'n breifat, a dim ond y fi a'm goruchwyliwr fydd yn edrych arno. Ni fydd eich enw ar yr holiadur.

Bydd y daflen wybodaeth a'r ffurflen gydsynio yn cael eu hysgrifennu yn Gymraeg ac yn Saesneg. Fodd bynnag dim ond yn Saesneg y bydd yr holiaduron.

Beth os nad wyf fi eisiau cymryd rhan?

Does dim rhaid ichi gymryd rhan os nad ydych eisiau. Os ydych am gymryd rhan fe roddir y daflen wybodaeth hon i chwi i'w chadw a gofynnir i chwi lenwi'r ffurflen gydsynio ar waelod y ddalen. Gall eich rhiant/warcheidwad ei lofnodi drosoch os ydych chi'n cael trafferth. Gallwch stopio cymryd rhan yn yr astudiaeth ar unrhyw amser, a does dim rhaid ichi ddweud pam wrthym.

Sut fydd yr astudiaeth hon yn helpu pobl?

Gall rhai plant gydag awtistiaeth ei chael chi'n anodd i ddeall am sefyllfaoedd cymdeithasol. Bydd yr astudiaeth hon yn dangos i ni rai o'r pethau a gânt hwy'n fwyaf anodd. Bydd yr astudiaeth hefyd yn gweld sut y gall hyfforddi ar gyfrifiadur eu helpu hwy i ddysgu'r sgiliau hyn. Os yw'r astudiaeth hon o gymorth, gofynnir i chi a hoffech roi cynnig ar yr hyfforddiant ar gyfrifiadur. Gall yr astudiaeth hon helpu llawer o blant gydag awtistiaeth.

- Os oes gennych unrhyw gwestiynau pellach cysylltwch â mi, Katie Haddock, yn Adeilad Brigantia, 43 Ffordd y Coleg, Bangor, Gwynedd LL57 2DG neu ffoniwch fi ar y rhif 01745 443314.
- Os oes gennych chi unrhyw gwynion am yr astudiaeth hon cysylltwch â:
 - vii. Yr Athro Fergus Lowe, Pennaeth Ysgol Yr Ysgol Seicoleg Prifysgol Cymru, Bangor LL57 2DG.

viii. Mr Keith Thomson, Prif Weithredwr

Ymddiriedolaeth GIG Gogledd Orllewin Cymru

Ysbyty Gwynedd, Bangor

Gwynedd LL57 2PW

DIOLCH I CHWI AM GYMRYD AMSER I

DDARLLEN Y DAFLEN HON.

Appendix 1.8 – Information sheet for children with mild learning disabilities

(Headed paper)

Study title: A CD-ROM based computer-training package for individuals with autism - a pilot study.

INFORMATION SHEET

You have been invited to take part in a study. Before you choose whether you want to be involved, I will explain why we are doing the study and what we want you to do. Please take time to read this sheet with me. You can talk about anything we say to your friends and family. Ask us if there is anything that you don't understand or that you would like more information about. Take time to choose whether or not you want to take part.

Thank you for reading this sheet.

What is the study?

We want to see whether some children and teenagers have problems with social skills i.e. knowing when to listen and knowing how to make eye-contact with someone when talking to

them. We will compare children and teenagers who probably won't find social skills difficult (like yourself) with children and teenagers who may find social skills difficult (like children and teenagers with autism). If they have problems with this, the study would then like to teach them how to improve these skills using a programme on a computer.

Why me?

Your school has agreed to be part of this study, and they said that you might want to help. This study needs a group of people who do not have autism to act as a comparison group – that is why we are asking you. I have written to your parents/guardian and they said it was ok for me to ask you whether you want to take part.

What do I have to do?

If you agree to take part, you will be asked to complete 1 questionnaire, which should take between 30-45 minutes. After this, I will come back another day and ask you to look at some

video clips on the computer. The clips will show people talking in a café and a clothes shop. I would like you to tell me whether they are doing things right or getting things wrong. This meeting should take about 30 minutes.

All the information you give me will be kept private, only myself and my supervisor will look at it. Your name will not be on the questionnaire.

This information sheet and the consent form will be written in Welsh and English. However the questionnaires will only be written in English.

What if I do not want to take part?

You don't have to take part if you don't want to. If you do want to you will be given this information sheet to keep and asked to sign the consent form at the bottom of the page. Your parent/guardian can sign it for you if you find it difficult to write. You can stop taking part in the study at any time, and you don't need to tell us why.

How will this study help people?

Some children with autism can find it difficult to understand about social situations. This study will show us some of the things they find more difficult. The study will also see whether training on a computer can help them to learn these skills. If this study works, the training could help a lot of children who find social situations difficult.

- If you have any further questions please contact me, Katie Haddock, at the Brigantia building, 43 College Road, Bangor, Gwynedd LL57 2DG or telephone me on 01745443314.
- If you have any complaints about this study please contact:
 - i. Professor Fergus Lowe, Head of School,
School of Psychology,
University of Wales, Bangor,
LL57 2DG.

- ii. Mr Keith Thomson, Chief Executive,
North West Wales NHS Trust,
Ysbyty Gwynedd Hospital, Bangor,
Gwynedd,
LL57 2PW.

**THANK YOU FOR TAKING TIME TO READ THIS
SHEET.**

Teitl yr astudiaeth: Pecyn hyfforddi-cyfrifiadurol CD ROM
ar gyfer unigolion gydag awtistiaeth - astudiaeth beilot.

TAFLEN WYBODAETH

Gwahoddwyd chwi i gymryd rhan mewn astudiaeth. Cyn eich bod yn penderfynu a ydych am eich cynnwys, fe esboniaf pam ein bod yn gwneud yr astudiaeth a beth yr ydym eisiau gennych chi. Cymerwch amser i ddarllen y daflen hon gyda mi os gwelwch yn dda. Gallwch sôn wrth eich teulu a'ch ffrindiau am unrhyw beth a ddywedwn. Gofynnwch i ni os oes unrhyw beth nad ydych chi'n ei ddeall neu yr hoffech gael mwy o wybodaeth arno. Cymerwch amser i ddewis a ydych am gymryd rhan ai peidio. Diolch am ddarllen y daflen hon.

Beth yw'r astudiaeth?

Yr ydym eisiau gwybod a yw rhai plant a rhai yn eu harddegau â phroblemau gyda sgiliau cymdeithasol h.y gwybod pryd i wrando a gwybod sut i wneud cyswllt llygad gyda rhywun wrth siarad gyda hwy. Byddwn yn cymharu plant a rhai yn eu harddegau nad ydynt yn cael sgiliau cymdeithasol yn anodd (fel chwi) gyda phlant a rhai yn eu harddegau a all gael sgiliau cymdeithasol yn anodd (megis plant a rhai yn eu harddegau

gydag awtistiaeth). Os ydynt yn cael problemau gyda hyn, fe hoffai'r astudiaeth wedyn eu dysgu sut i wella'r sgiliau hyn gan ddefnyddio rhaglen ar gyfrifiadur.

Pam fi?

Mae'ch ysgol chwi wedi cytuno i fod yn rhan o'r astudiaeth, a dywedasant y gallech chi fod eisiau helpu. Mae ar yr astudiaeth hon angen grwp o bobl nad oes ganddynt awtistiaeth i weithredu fel grwp cymharu - dyna pam ein bod yn gofyn i chwi. Yr wyf wedi ysgrifennu at eich rhieni/gwarcheidwad a ddywedodd ei bod yn iawn imi ofyn i chwi a fuasech am gymryd rhan.

Beth sy'n rhaid i mi ei wneud i gymryd rhan?

Os ydych yn cytuno i gymryd rhan gofynnir i chwi gwblhau holiadur, a ddylai gymryd rhwng 30 a 45 munud. Wedyn, fe ddof fi'n ôl ar ddiwrnod arall a gofyn i chwi edrych ar glips fideo ar gyfrifiadur. Bydd y clips yn dangos pobl yn siarad mewn caffi a siop ddillad. Fe hoffwn i i chwi ddweud wrthyf a ydynt yn gwneud pethau'n iawn neu'n gwneud pethau'n anghywir. Fe ddylai'r cyfarfod hwn gymryd tua 30 munud.

Bydd yr holl wybodaeth a roddwch i mi yn cael ei gadw'n breifat, a dim ond y fi a'm goruchwyliwr fydd yn edrych arno. Ni fydd eich enw ar yr holiadur.

Bydd y daflen wybodaeth a'r ffurflen gydsynio yn cael eu hysgrifennu yn Gymraeg ac yn Saesneg. Fodd bynnag dim ond yn Saesneg y bydd yr holiaduron.

Beth os nad wyf fi eisiau cymryd rhan?

Does dim rhaid ichi gymryd rhan os nad ydych eisiau. Os ydych am gymryd rhan fe roddir y daflen wybodaeth hon i chwi i'w chadw a gofynnir i chwi lenwi'r ffurflen gydsynio ar waelod y ddalen. Gall eich rhiant/warcheidwad ei lofnodi drosoch os ydych chi'n cael trafferth. Gallwch stopio cymryd rhan yn yr astudiaeth ar unrhyw amser, a does dim rhaid ichi ddweud pam wrthym.

Sut fydd yr astudiaeth hon yn helpu pobl?

Gall rhai plant gydag awtistiaeth ei chael chi'n anodd i ddeall am sefyllfaoedd cymdeithasol. Bydd yr astudiaeth hon yn dangos i ni rai o'r pethau a gânt hwy'n fwyaf anodd. Bydd yr astudiaeth hefyd yn gweld sut y gall hyfforddi ar gyfrifiadur eu helpu hwy i ddysgu'r sgiliau hyn. Os yw'r

astudiaeth hon yn llwyddiannus, gall yr hyfforddiant helpu llawer o blant sy'n cael sefyllfaoedd cymdeithasol yn anodd.

- Os oes gennych unrhyw gwestiynau pellach cysylltwch â mi, Katie Haddock, yn Adeilad Brigantia, 43 Ffordd y Coleg, Bangor, Gwynedd LL57 2DG neu ffoniwch fi ar y rhif 01745 443314.
- Os oes gennych chi unrhyw gwynion am yr astudiaeth hon cysylltwch â:

ix. Yr Athro Fergus Lowe, Pennaeth Ysgol

Yr Ysgol Seicoleg

Prifysgol Cymru, Bangor

LL57 2DG.

x. Mr Keith Thomson, Prif Weithredwr

Ymddiriedolaeth GIG Gogledd Orllewin Cymru

Ysbyty Gwynedd

Bangor

Gwynedd LL57 2PW

DIOLCH I CHWI AM GYMRYD AMSER I DDARLLEN Y

DAFLEN HON.

Appendix 1.9 – Information sheet for children with no disabilities

(Headed paper)

Study title: A CD-ROM based computer-training package for individuals with autism - a pilot study.

INFORMATION SHEET

You have been invited to take part in a research study. Before you decide whether you would be willing to take part it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully with me. You can talk about anything we say to your friends and family. Ask us if there is anything that you don't understand or that you would like more information about. Take time to decide whether or not you wish to take part.

Thank you for reading this information sheet.

What is the study?

We want to see whether some children have difficulty with social skills i.e. looking at people when you are talking to them and knowing when somebody is upset or angry. We will compare groups of children and adolescents who are unlikely have difficulty with social skills (i.e. individuals with no disabilities and individuals with mild learning disabilities) with children and adolescents who are likely to have difficulty (i.e. individuals with autism). If they have difficulty with this, the research would then like to teach them how to improve these skills using a computer-based programme.

Why me?

Your school has agreed to be part of this research, and they said that you might be willing to help with this research. I have written to your parents/guardian and they have agreed to let me ask you whether you want to take part.

What do I have to do?

If you agree to take part, you will be asked to complete 1 questionnaire, which should take between 30-45 minutes. After this, I will come back another day and ask you to look at some video clips on the computer, which will have people talking in a café and a clothes shop. I would like you to tell me whether they are doing things right or getting things wrong. This meeting should take about 30 minutes.

All information collected will be kept private, only myself and my supervisor will look at it. Your name will not be on the questionnaire.

This information sheet and the consent form will be provided in Welsh and English. However the questionnaires will be written in English.

What if I do not wish to take part?

You don't have to take part if you don't want to. If you do want to you will be given this information sheet to keep and asked to sign the consent form at the bottom of the page. If you do take part you are still free to withdraw at any time and without giving a reason.

Who benefits from this project and how?

Some children with autism can find it difficult to understand social situations. This project will allow us to assess some of the things they find more difficult and see whether a computer-based training package helps them to learn these skills. If the training works, the package could help a lot of children with autism facing these difficulties.

- If you have any further questions please contact me, Katie Haddock, at the Brigantia building, 43 College Road, Bangor, Gwynedd LL57 2DG (01745443314).
- If you have any complaints about how this study is conducted please address these to:
 - i) Professor Fergus Lowe, Head of School, School of Psychology, University of Wales, Bangor, LL57 2DG.
 - ii) Mr Keith Thomson, Chief Executive, North West Wales NHS Trust, Ysbyty Gwynedd Hospital, Bangor, Gwynedd, LL57 2PW.

THANK YOU FOR TAKING TIME TO READ THIS LEAFLET.

Teitl yr Astudiaeth: Pecyn hyfforddi cyfrifiadurol CD-ROM i unigolion gydag awtistiaeth - astudiaeth beilot.

TAFLEN WYBODAETH

Gwahoddwyd chi i gymryd rhan mewn astudiaeth ymchwil. Cyn ichi benderfynu a fydddech yn fodlon cymryd rhan ai peidio mae'n bwysig i chi ddeall pam fod yr ymchwil yn cael ei wneud a beth fydd yn ei olygu. Cymerwch amser os gwelwch yn dda i ddarllen yr wybodaeth ganlynol yn ofalus gyda mi. Gallwch siarad am unrhyw beth a ddywedwn gyda'ch teulu a'ch ffrindiau. Gofynnwch i ni os oes unrhyw beth nad ydych yn ei ddeall neu yr hoffech fwy o wybodaeth amdano. Cymerwch amser i benderfynu a ydych am gymryd rhan ai peidio.

Diolch i chi am ddarllen y daflen wybodaeth hon.

Beth yw'r astudiaeth?

Yr ydym eisiau gwybod a yw rhai plant yn cael trafferthion gyda sgiliau cymdeithasol h.y edrych ar bobl pan fyddwch yn siarad â hwy a gwybod pan fo rhywun yn ofidus neu'n flin. Byddwn yn cymharu grwpiau o blant a phobl ifanc sy'n annhebyg o gael trafferthion gyda sgiliau cymdeithasol (h.y unigolion gyda dim anabledau ac unigolion gydag anabledau dysgu ysgafn) gyda phlant a phobl ifanc sy'n debygol o gael trafferthion (h.y unigolion gydag awtistiaeth). Os cânt drafferth gyda hyn, fe hoffai'r ymchwil wedyn eu dysgu sut i wella'r sgiliau hyn gan ddefnyddio rhaglen gyfrifiadurol.

Pam fi?

Mae'ch ysgol wedi cytuno i fod yn rhan o'r ymchwil hwn, a dywedasant efallai y bydddech chi'n barod i helpu gyda'r ymchwil hwn. Yr wyf wedi ysgrifennu at eich rhieni/gwarcheidwad ac maent wedi cytuno i adael i mi ofyn i chwi a ydych am gymryd rhan?

Beth sy'n rhaid i mi ei wneud?

Os ydych yn cytuno i gymryd rhan, gofynnir i chi gwblhau un holiadur, a ddylai gymryd rhwng 30 a 45 munud. Wedi hyn, fe ddof fi'n ôl ar ddiwrnod arall a gofyn i chi edrych ar rai clips fideo ar y cyfrifiadur, a fydd yn dangos pobl yn siarad mewn caffi a siop ddillad. Fe hoffwn i chi ddweud wrthyf a ydynt yn gwneud pethau'n iawn neu'n anghywir. Fe ddylai'r cyfarfod hwn gymryd tua 30 munud.

Bydd pob gwybodaeth a gesglir yn cael ei gadw'n gyfrinachol, dim ond y fi a'm goruchwylydd fydd yn edrych arno. Ni fydd eich enw ar yr holiadur.

Bydd y daflen wybodaeth hon a'r ffurflen gydsynio yn cael ei darparu yn Gymraeg ac yn Saesneg. Fodd bynnag bydd yr holiaduron yn Saesneg yn unig.

Beth os nad wyf fi eisiau cymryd rhan?

Does dim rhaid ichi gymryd rhan os nad ydych eisiau. Os ydych am gymryd rhan fe roddir ichi'r daflen wybodaeth hon i'w chadw a gofynnir i chi lofnodi'r ffurflen gydsynio

ar ddiwedd y ddalen. Os ydych yn cymryd rhan yr ydych yn dal i fod yn rhydd i dynnu'n ôl ar unrhyw amser a heb roi rheswm.

Pwy sy'n cael budd o'r project hwn a sut?

Gall rhai plant gydag awtistiaeth ei chael hi'n anodd i ddeall sefyllfaoedd cymdeithasol. Bydd y project hwn yn ein galluogi i asesu rhai o'r pethau a gânt yn fwyaf anodd a gweld a all pecyn hyfforddi cyfrifiadurol eu helpu i ddysgu'r sgiliau hyn. Os yw'r hyfforddiant yn gweithio, gallai'r pecyn helpu llawer o blant gydag awtistiaeth sy'n wynebu'r trafferthion hyn.

- Os oes gennych unrhyw gwestiynau pellach cysylltwch â mi, Katie Haddock, yn Adeilad Brigantia, 43 Ffordd y Coleg, Bangor, Gwynedd LL57 2DG neu ffoniwch fi ar y rhif 01745 443314.
- Os oes gennych chi unrhyw gwynion am yr astudiaeth hon cysylltwch â:
 - xi. Yr Athro Fergus Lowe, Pennaeth Ysgol
Yr Ysgol Seicoleg
Prifysgol Cymru, Bangor
LL57 2DG.
 - xii. Mr Keith Thomson, Prif Weithredwr
Ymddiriedolaeth GIG Gogledd Orllewin Cymru
Ysbyty Gwynedd
Bangor
Gwynedd
LL57 2PW

**DIOLCH I CHWI AM GYMRYD AMSER I DDARLLEN Y DAFLEN
HON.**

Appendix 1.10 – Consent form for participants

RESEARCH CONSENT FORM FOR PARTICIPANTS

The present study aims to explore whether individuals with autism have difficulty with social skills. If they do have difficulty with social skills, the research will assess whether a computer-based teaching package is an appropriate and successful way to teach them these skills.

Please complete the following and delete as necessary:

- 3) Have you read the participant information sheet? YES/NO
- 2) Have you had an opportunity to ask questions and discuss this study? YES/NO
- 3) Have you received satisfactory answers to all of your questions? YES/NO
- 4) Have you received enough information about this study? YES/NO
- 5) Who has explained the details of this study to you?.....
- 5) Do you understand that you are free to withdraw from this study -
 - ..at any time
 - ..without giving a reason for withdrawing
 YES/NO

Signed.....

Date.....

Name in block letters.....

Address and/or contact number.....

Consent witnessed by.....

Signed by witness.....

- If you have any further questions, please contact me, Katie Haddock, at Brigantia building, 43 College Road, Bangor Gwynedd, LL57 2DG (01745443314).

If you have any complaints about how this study is conducted please address these to:

- i. Professor CF Lowe, Head of School, School of Psychology, University of Wales, Bangor, LL57 2DG.
- ii. Chairperson, North Wales Health Authority Research Ethics Committee (West), c/o Miss Liz James, Administrator, Room 1/178, Ysbyty Gwynedd Hospital, Bangor, Gwynedd, LL57 2PW.

FFURFLEN CYDSYNIO YMCHWIL I RAI SY'N CYMRYD RIIAN

Nod yr astudiaeth hon yw ymchwilio p'un ai fod unigolion gydag awtistiaeth yn cael trafferth gyda sgiliau cymdeithasol. Os ydynt yn cael trafferth gyda sgiliau cymdeithasol, bydd yr ymchwil yn asesu p'un ai fod pecyn dysgu cyfrifiadurol yn ffordd briodol a llwyddiannus o ddysgu'r sgiliau hyn iddynt.

Cwblhewch y canlynol a dileu fel bo'n briodol os gwelwch yn dda:

- 1) Ydych chi wedi darllen y daflen wybodaeth i rai sy'n cymryd rhan?
DO/NADDO
- 2) Ydych chi wedi cael cyfle i ofyn cwestiynau ac i drafod yr astudiaeth?
DO/NADDO
- 3) Ydych chi wedi derbyn atebion boddhaol i'ch holl gwestiynau?
DO/NADDO
- 4) Ydych chi wedi derbyn digon o wybodaeth am yr astudiaeth hon?
DO/NADDO
- 5) Pwy sydd wedi esbonio manylion yr astudiaeth hon i chwi?
- 6) Ydych chi'n deall eich bod yn rhydd i dynnu'ch plentyn yn ôl o'r astudiaeth hon -
 - ar unrhyw adeg
 - heb roi rheswm dros dynnu'n ôl
 YDW/NAG YDW

Llofnodwyd:

Dyddiad:

Enw mewn llythrennau bras:

Cyfeiriad a/neu rif cysylltu:

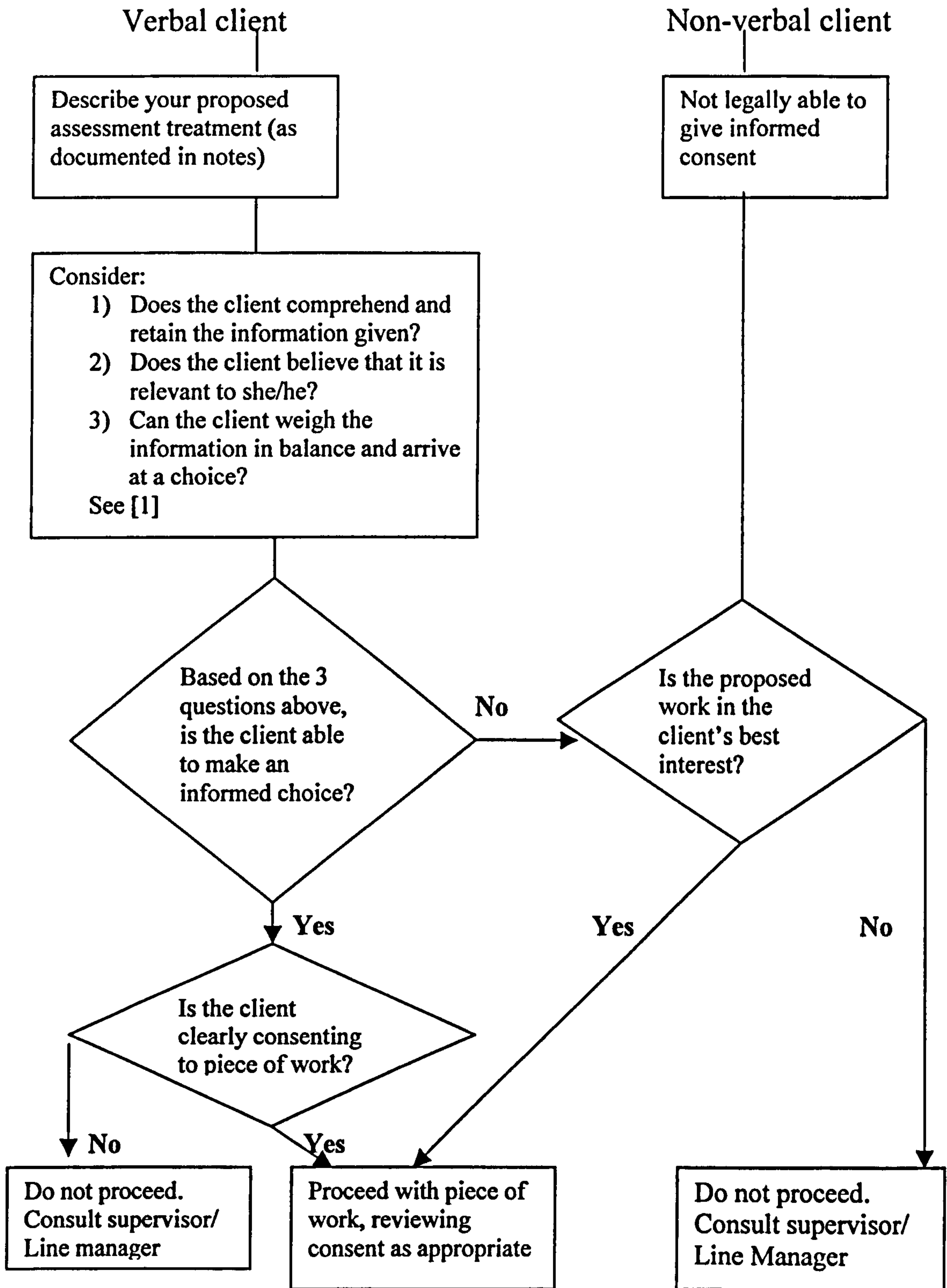
Yn dyst i'r cydsynio 'roedd:

Llofnodwyd gan y tyst:

- Os oes gennych unrhyw gwestiynau pellach cysylltwch â mi, Katie Haddock, yn Adeilad Brigantia, 43 Ffordd y Coleg, Bangor, Gwynedd LL57 2DG neu ffoniwch fi ar y rhif 01745 443314.
- Os oes gennych chi unrhyw gwynion am yr astudiaeth hon cyfeiriwch y rhain at:
 - iii. Yr Athro F Lowe, Pennaeth Ysgol, Yr Ysgol Seicoleg, Prifysgol Cymru, Bangor, LL57 2DG.
 - iv. Cadeirydd, Pwyllgor Moeseg Ymchwil Awdurdod Iechyd Gogledd Cymru (Gorllewin), d/o Miss Liz James, Gweinyddwraig, Ystafell 1/178, Ysbyty Gwynedd, Bangor, Gwynedd LL57 2PW.

Appendix 1.11 - Consent flowchart

Consent flowchart



'Eastman test' – capacity as provided by British Medical Association and Law Society (1995)

Appendix 1.12 – Researchers' CVs

Researchers' CVs were attached here

Appendix 1.13 – Research Protocol

‘A CD-ROM based computer-training package for individuals with autism - a pilot study.’

RESEARCH PROTOCOL

What is Autism?

Autism is a ‘spectrum disorder’ (Wing, 1996) that ranges from ‘classic’ Kanner type autism with severe learning disabilities to high functioning autism (HFA) and Asperger’s syndrome. Autism is diagnosed according to a triad of impairments in communication, socialisation and imagination (Wing & Gould, 1979). Arguably the socialisation difficulties are the most debilitating feature of autism (Rogers, 2000). Socialisation difficulties can include: (i) problems or lack of interest in mixing with peer group, (ii) problems with understanding the subtleties of social situations, (iii) inappropriate social or emotional responses, and (iv) resistance to changes in routine (Attwood, 1997)

Children between the ages of 12 and 24 months have “...learned the social skills fundamental to interaction...getting and holding their parents attention, taking turns, and maintaining interaction by cooing, smiling and babbling” (Hart and Risley, 1999). Krantz (2000) reports that it is these skills that are often underrepresented or missing from the repertoires of children with autism.

Social skills difficulties

Children and adolescents with autistic spectrum disorders often behave inappropriately when interacting and communicating with other people (Wing, 1992). Many studies have identified a number of problems that individuals with autism have with understanding the thoughts, beliefs and feelings of other people (Leslie & Frith, 1990; Loveland et al, 1995). This inability to understand others could maintain the social skills

problems that individuals with autism face (Loveland, Pearson, Tunali-Kotoski, Ortegon & Gibbs, 2001).

Individuals with autism are reported to be poor mind readers. They have limited understanding of the role that mental states play in determining emotions and behaviour (Rieffe, Terwogt, Stockmann, 2000). Pierce, Glad and Schreibman (1997) identified that individuals with autism were comparatively poorer than individuals with learning disabilities (without autism) and children without disabilities at identifying the appropriateness of children's actions when looking at a videotape of peer interactions. The children with autism found it more difficult to identify the possible reasons for emotions and behaviours in situations where multiple social cues were available.

Poor understanding of other people's point of view (Lee & Prentice, 1988), inability to identify relevant social cues (Dodge, Pettit, McClaskey & Brown, 1986), and difficulty in attributing emotional states (Cannella, Valenti & Lesk, 1993) have been associated with aggressive behaviour within a non-autistic population. Individuals with autism often contend with all three problems.

Loveland, Pearson, Tunali-Kotoski, Ortegon & Gibbs (2001), using examples of appropriate and inappropriate behaviour recorded on videotape, found that a group of children with autism were less skilled at identifying inappropriate behaviour compared to a matched control group without autism.

Teaching individuals with autism

Many studies have investigated the most appropriate way to try and teach individuals with autism, and historically this has relied on behavioural interventions (Jacobson, Mulick & Green, 1998). However, recent research has identified that individuals with autism may respond more readily to computer-based programmes rather than teachers (Heimann, Nelson, Tjus & Gillberg, 1995). Moore and Calvert (2000) compared computer programmes to behavioural programmes for vocabulary acquisition in children with autism – both programmes followed the same course but the computer programme

added interesting sounds and object movement. The results indicated that children with autism were more attentive, motivated, and learned more vocabulary with the computer programme than the behavioural programme.

More recently Bernard-Opitz, Sriram and Nakhoda-Sapuan (2001) reported that children with autism are relatively skilled in responding to visual cues such as pictures and animation, and developed a computer-programme to assist children with autism in social problem solving skills. The results indicated that computer based programmes effectively taught the children with autism social problem solving skills. This study suggests that future directions should focus on identifying whether computer-assisted instruction will generalise to nontrained social situations in real life contexts.

As the evidence base for teaching individuals with autism suggests that computer-based programmes may be the most appropriate method, the present investigators produced a CD-ROM, which includes a number of appropriate and inappropriate social interactions. All of the scenes include speech. It is proposed that the CD-ROM can both assess the ability of individuals with autism to interpret social situations in comparison to learning disabled individuals (without autism) and children without disabilities, and teach them about appropriate and inappropriate interactions. Furthermore, the CD-ROM will assess whether any new skills that have been acquired can generalise to new social situations. The study therefore has three objectives:

- (1) Identify whether individuals with autism are less skilled at identifying appropriate and inappropriate social interactions than individuals with a mild learning disability (and no autism) and children without disabilities.
- (2) Identify whether individuals with autism can be taught the difference between appropriate and inappropriate interaction with the support of a computer-based programme.

- (3) If successfully taught the difference between appropriate and inappropriate interactions, assess whether the developed social skills can be transferred to new social situations.

References

Attwood, T. (1997). *Asperger's Syndrome: A guide for parents and professionals*. London: Jessica Kingsley Publishers.

Bernard-Opitz, V., Sriram, N., & Nakhoda-Sapuan, S. (2001). Enhancing social problem solving in children with autism and normal children through computer-assisted instruction. *Journal of autism and developmental disorders, 31 (4)*, pp 377-384.

Cannella, C., Valenti, S. S., & Lesk, S. (1993). *Conduct disordered boys' recognition of anger in naturalistic videotapes*. Paper presented to the 7th International Conference on Event Perception and Action, August 8-13, Vancouver, B.C., Canada.

Dodge, K. A., Pettit, G. S., McClaskey, C. L., & Brown, M. M., (1986). Social competence in children. *Monographs of the society for research in child development, 51, 2, serial No. 213*.

Hart, B., & Risley, T.R. (1999). *The social world of children: hearing to talk*. Baltimore: Paul H. Brookes Publishing.

Heiman, M., Nelson, K. E., Tjus, T., & Gillberg, C. (1995). Increasing reading and communication skills in children with autism through an interactive multimedia program. *Journal of autism and developmental disorders, 25*, pp 459-480.

Jacobson, J. W., Mulick, J. A., & Green, G. (1998) Public policy and the punishment of the powerless. *Child and Adolescent Mental Health Care, 3 (1)*, pp 7-18.

Krantz, P. J. (2000). Commentary: interventions to facilitate socialization. *Monographs of the society for research in child development, 58*, pp 411-413.

Lee, M., & Prentice, N. (1988). Interrelations of empathy, cognition, and moral reasoning with dimensions of juvenile delinquency. *Journal of abnormal and clinical psychology, vol 16*, pp 127-139.

Leslie, A.M., & Frith, U. (1990). Prospects for a cognitive neuropsychology of autism: Hobson's choice. *Psychological Review, 97*, pp 122-131.

Loveland, K.A., Pearson, D.A., Tunali-Kotoski, B., Ortegon, J., & Gibbs, M. C. (2001) Judgements of social appropriateness by children and adolescents with autism. *Journal of autism and developmental disorders, 31 (4)*, pp 367-376.

Loveland, K.A., Tunali-Kotoski, B., Chen, R., Brelsford, K. A., Ortegon, J., & Pearson, D. A. (1995). Intermodal perception of affect in persons with autism or Down syndrome. *Development and Psychopathology, 7*, 409-418.

Moore, M., & Calvert, S. (2000). Brief report: Vocabulary acquisition for children with autism: Teacher or computer instruction. *Journal of autism and developmental disorders, 30 (4)*, pp 359-362.

Pierce, K., Glad, & Schreibman. L. (1997). Social perception in children with autism: An attention deficit? *Journal of autism and pervasive developmental disorders, 27*, 265-282.

Rieffe, C., Terwogt, M. M., & Stockmann, L. (2000). Understanding atypical emotions among children with autism. *Journal of autism and developmental disorders, 30 (3)*, pp 195-203.

Rogers, S. J. (2000). Interventions that facilitate socialization in children with autism. *Journal of autism and developmental disorders, 30*, pp 399-409.

Wing, L. (1992). Autism initiative: Can functional assessment replace medical diagnosis evaluation? *BC Medical Journal* (34), 6, pp 387.

Wing, L. (1996). Autistic spectrum disorders. *British Medical Journal*, 312, 327-328.

Wing, L., & Gould, J. (1979). Severe impairments of social interaction and associated abnormalities in children: epidemiology and classification. *Journal of autism and developmental disorders*, 9, pp 11-29.

Appendix 1.14 – Letters confirming ethical approval

**Ysgol Seicoleg
Prifysgol Cymru, Bangor**

Adeilad Brigantia, Ffordd Penrallt
Bangor, Gwynedd LL57 2AS

Ffôn: (01248) 382211 - Ffacs: (01248) 382599
e-host: psychology@bangor.ac.uk
www.psychology.bangor.ac.uk



**School of Psychology
University of Wales, Bangor**

Adeilad Brigantia, Penrallt Road
Bangor, Gwynedd LL57 2AS

Tel: (01248) 382211 - Fax: (01248) 382599
e-mail: psychology@bangor.ac.uk
www.psychology.bangor.ac.uk

October 15, 2002

Dr. Robert Jones, Ms. Katie Haddock
North Wales Clinical Psychology Course
University of Wales
Bangor
Gwynedd, LL57 2DG

Dear Colleagues

- **A CD-Rom based computer-training package for individuals with Autism – a pilot study**

Your research proposal (referred to above and on the attached sheet) has been reviewed by the School of Psychology Research Ethics Committee and they are satisfied that the research proposed accords with the relevant ethical guidelines. If you wish to make any substantial modifications to the research project please inform the committee in writing before proceeding. Please also inform the committee as soon as possible if research participants experience any unanticipated harm as a result of participating in your research.

You should now forward the proposal to the appropriate Research Ethics Committees of the North Wales Health Authority. They expect one of the investigators to make an oral presentation in support of the proposal at their meeting. You will be contacted by their committee with details as to the date and place of the meeting at which your proposal will be considered.

You may not proceed with the research project until you are notified of the approval of the NWA research ethics committee.

Yours sincerely

Kath Chitty
Coordinator - School of Psychology Research Ethics Committee

*Pwyllgor Moeseg Ymchwil
Awdurdod Iechyd Gogledd Cymru
(Is-bwyllgorau'r Gorllewin, y Canol a'r Dwyrain)*

*North Wales Health Authority
Research Ethics Committee
(West, Central & East sub-committees)*

**IS-BWYLLGOR Y GORLLEWIN
WEST SUB-COMMITTEE**

Ffôn/Tel : (01248) 384 877 (llinell uniongyrchol/direct line) Uned Cefnogi Rheolaeth Glinigol /
Ffacs/Fax : (01248) 370 629 Clinical Governance Support Unit
Llyth-e/E-mail : liz.james@nww-tr.wales.nhs.uk Ysbyty Gwynedd
Bangor
Gwynedd LL57 2PW

19.3.03

Katie Haddock
School of Psychology
Brigantia Building
43 College Road
Bangor
Gwynedd LL57 2DG

Dear Ms Haddock

CONFIRMATION OF FULL ETHICS APPROVAL

Re: CD-ROM based computer training package for individuals with autism – a pilot study

I confirm that the North Wales Health Authority Research Ethics Committee (West) is pleased to grant full ethics approval to the above, on condition that:

- the protocol is followed as agreed
- the project commences within 3 years of the date of this letter
- the committee is notified of all protocol amendments and serious adverse events as soon as possible
- the committee receives annual progress reports and/or a final report within 3 months of completion of the project.

Approval from host institutions must be sought separately.

The Committee reserves the right to audit local research records relating to the above study. Ethics approval is granted on this basis.

The Committee aims to be fully ICH/GCP compliant. Please find attached a copy of our working constitution and a list of members.

Yours sincerely


Dr P Barry
Chairman, Ethics Committee (West)

**Social Skills Training for Individuals with Autistic Spectrum
Disorder: A Review of the Literature**

Katie Haddock

*Department of Clinical Psychology, University of Wales, Bangor,
Gwynedd, LL57 2DG*

Dr Robert Jones

*Clinical Psychologist, University of Wales, Bangor,
Gwynedd, LL57 2DG*

Running Head – Social skills training in autism

**Journal prepared for submission to: Autism: The International Journal of
Research and Practice. Please refer to Appendix 2.1 for details of notes for
the author.**

Abstract

The current paper reviews the evidence base on social skills training for individuals with autistic spectrum disorder. The historical overview divides the paper into four sections; (1) Child-specific training (2) Adult-child training (3) Peer-child training and (4) Class wide training. Many of the studies show promising results, but some report that the removal of the reinforcer can result in a loss of acquired skills. Recent research has concentrated on including powerful reinforcers to motivate learning in this population. Computers are considered to be particularly reinforcing for individuals with autistic spectrum disorder. Computer-based training has reportedly been an effective and motivating method to teach a variety of skills with this population. However the evidence base for computer-based training of social skills is still relatively sparse.

Keywords: Social skills training; Autistic spectrum disorder; Computer-based training

Address for correspondence: Ms Katie Haddock
Clinical Psychology Department
Brigantia Building
43 College Road
Bangor
Gwynedd
Wales
LL57 2DG

Social impairment in Autism.

When Kanner outlined the original characteristic features of autism in 1943, he reported that one of the core deficits was a marked impairment in social behaviour. More specifically he noted that younger children with autism did not lift their arms to be picked up, would not direct anger towards a person causing them distress, and were abnormal in their use of eye contact. Kanner labelled their lack of affective contact with others “extreme autistic loneliness”. In support of these findings Hans Asperger submitted a paper in 1944 outlining similar social impairments in a group of children. He reported that the disturbance in social relating was the central and fundamental impairment underlying autistic psychopathy. Current diagnostic criteria are guided by the ‘Triad of Impairments’ (Wing & Gould, 1979), of which ‘social impairment’ forms an individual category. Within this category, the impairments can include an absence of eye-contact signalling; a lack of reciprocity in social relationships; an absence of social or emotional gestures; lack of empathy; attachment problems such as inability to use parents as a secure base; little interest in peer relationships; and little interest in sharing positive emotions such as pride or pleasure with others (Carr, 1999).

Stone and Lemanek (1990) reported that signs of social interaction and responsiveness are usually established and intact at the age of two years for children with autism. However, recent research has established difficulties in social interaction for this population under the age of two years (Wimpory, Hobson Williams & Nash, 2000) i.e. a lack of offering, showing or pointing to objects in relation to somebody else or following somebody else’s point. Early difficulties can delay long-term

development of social behaviour and widen the developmental gap between children with autism and their typically developing peers (McGee et al., 1999).

Such deficits occur throughout the age range. Hobson and Lee (1998) videotaped 24 children, adolescents and adults with autism with ages ranging between 8.3-21.1 years and noted that individuals with autism were less likely to produce spontaneous verbal or nonverbal gestures to greet or say farewell to an unfamiliar adult, establish eye contact with others even after a specific greeting by the other person, or smile and wave goodbye – compared to individuals with learning disabilities. The social impairment can negatively impact on the forming and maintaining of relationships and employment, and can often lead to social exclusion (Howlin, 1997).

To date, social impairment is still considered a core feature in autism (Kennedy & Shukla, 1995; Lord & Magill-Evans, 1995; Sigman & Ruskin, 1999). The deficit has been identified as autism specific rather than attributable to a more general learning disability (Pierce et al., 1997; Sigman & Ruskin, 1999; Vostanis et al., 1998). Rogers (2000) described the social deficit as ‘perhaps the most defining and handicapping feature of autism’. However, the development of social skills can be related to positive long-term adjustment (Ozonoff & Miller, 1995).

Cognitive theories have been developed to try and identify and explain the specific social deficits found in autism:

Theory-of-mind (ToM) deficit theory (Baron-Cohen, 1995) or ‘mind blindness’:

‘Theory of Mind’ is the term used by cognitive developmental researchers to refer to an individual’s ability to infer the mental state of self and others (e.g. their

knowledge, intentions, beliefs, desires) in order to predict and explain other peoples' behaviour.

Theory of Mind is generally established by the age of four years in typically developing children. However, this ability is seemingly absent in individuals with autism. To assess this, Baron-Cohen, Leslie and Frith (1985) compared the ability of children with autism (with a mental age of four years) to individuals with Down syndrome (with a mental age slightly below age four years) in a false-belief task called the Sally-Ann task. The task involved the children understanding that another person can have a false-belief about a situation. Of the individuals with autism 80% failed the task, whereas only 14% of the individuals with Down syndrome failed the task. Which suggests that lack of ToM is autism specific deficit rather than attributable to a more general learning disability.

It has been argued that the lack of development of this skill could account for the core triad of impairments displayed in autism (Baron-Cohen, 1989). With regard to socialisation, the ability to understand or predict the mental state of others is a key skill for social competency i.e. a lack of understanding that certain comments can offend people could lead to social isolation. Attempts have been made to facilitate ToM skills in younger children with autism, with some success but limited generalisation (Swettenham, Baron-Cohen, Gomez & Walsh, 1996).

Weak central coherence theory (Frith & Happe, 1994):

Central coherence refers to the ability to process information globally and then to extract higher-level meaning through the inferences made in the information. Central coherence is reported to be difficult for individuals with autism as they have a bias towards recalling the details rather than the global meaning of information. With

regard to socialisation, this can be particularly difficult, as individuals with autism can find it hard to understand the relevance of different kinds of knowledge to a particular problem (Frith & Happe, 1994). Therefore they might understand the rules of social behaviour in detail, but just not understand in which context to use them i.e. they could understand that by taking another child's toy without permission the other child might become upset – however they do not think about the impact on the other child when they take the toy because the social skill has not been activated. Therefore they might know the rules, but do not know when to appropriately use them (Attwood, 1998).

Executive dysfunction (Damasio & Maurer, 1978):

Executive functions include the ability to disengage from an external context; inhibit inappropriate responses; generate and plan actions; sustain an appropriate cognitive set and stay on task; resist habitual but no longer adaptive behaviours; monitor performance and use feedback to take corrective action; and shift attentional set flexibly. Individuals with autism perform poorly on a range of tests assessing executive function (Prior & Hoffman, 1990; Ozonoff, Pennington & Rogers, 1991). Executive dysfunction theory suggests that individuals with autism have deficits in the pre-frontal cortex, which inhibits their ability to display flexible behaviour. Executive dysfunction has reportedly negatively affected social interactions skills (McEvoy, Rogers & Pennington, 1993); pretend play (Jarrold, 1997) and imitation (Rogers, Bennetto, McEvoy & Pennington, 1996). Naturally, the inability to disengage from a task to respond to a person's question, or to self-monitor the social interaction and adapt behaviour accordingly has a huge impact on social competence.

Cognitive theories have highlighted the mechanisms that might be influencing the social skill deficits found in individuals with autism. However few theories have addressed the issue of intervention. Many of the social skill intervention packages have been influenced by the work of Lovaas, who suggested that by changing and structuring the environment, individuals with autism could learn about social rules. The effectiveness of such interventions has met with varying success.

Facilitating social competency with individuals with autism

Historical overview

The range and sophistication of the interventions that facilitate social competency in children with autism has significantly advanced in the past 20 years (McConnell, 2002). Early efforts in applied behaviour analysis concentrated on teaching specific skills such as eye contact and giving hugs. More recently the literature has developed to address the whole gamut of social deficits faced by individuals with autism.

This review will divide the appraisal of social skills packages into 4 categories (1) Child-specific training (2) Adult-Child training (3) Peer-child training (4) Class wide training. The studies reviewed are not exhaustive, and interventions that have a sparse evidence base have not been included i.e. social story training.

Child-specific training:

Child-specific training packages include instructional and/or reinforcement procedures developed to increase the skill, quality or frequency of social behaviours presented by children with autism. These packages often follow a similar format to those utilised with other populations (McConnell et al., 1991). McConnell (2002) divides child-specific interventions into five components; (a) general instructional

interventions to increase knowledge and improve social problem solving skills, (b) high-density reinforcement to “prime” social responding, (c) social skills training, (d) adult-mediated prompting and reinforcement, and (e) various generalisation promotion techniques (particularly self-monitoring).

In child-specific interventions, much focus is given to the child with autism initiating social contact. Many of the interventions incorporate a behavioural methodology that utilises reinforcement-based procedures. Davis et al., (1994) used a “high-probability request” strategy to encourage children with autism to socially interact with peers. As the target child was unlikely to conform to the teacher’s request to interact, the request was preceded by three rapid sequence requests for high-probability behaviours already in the child’s repertoire. The results reported an increase in unprompted initiations and extended interactions with trained and untrained peers, and this generalised to new settings. Belchic and Harris (1994) also increased the levels of child initiation of social interaction. They taught three 4 and 5 year old children with autism to initiate and maintain social interaction with typically developing peers. The research was conducted using a multiple-baseline design. The outcome reported an increase in time spent in social interaction in free play activities where prompts and praise were contingent on social initiations. Koegel et al., (1992) found that self-management techniques were also an effective way to increase verbal responses to others’ social initiations – but noted that the withdrawal of the reinforcement resulted in a decrease in response from two of the four participants. Such an outcome may reflect the assumption that social interaction is not intrinsically reinforcing for this population. Therefore without appropriate maintenance strategies, the initiation of social contact is likely to diminish with the reinforcement.

Self-monitoring has been established as a maintenance method and allows the child to maintain interactions without adult reinforcement (Strain et al., 1994). Shearer et al., (1996) introduced child self-monitoring of activity engagement and social interaction during play with typically developing peers after the child had been exposed to an adult-mediated intervention. The child monitoring maintained the activity engagement and social interaction for children with autism. Strain et al., (1994) found similar results.

LaLonde and Chandler (1995) directly taught conversational skills to three children with autism. The skills were separated into five sections; making a conversation, turn-taking in conversation, listening, maintaining a conversational topic and changing a topic of conversation appropriately. Each section was taught in turn until the child had mastered the concept. Conversational ability improved in all of the children. In particular, there were reported increases in both the percentage of time a child spent in shared interest (both the child and the carer focusing attention on the same conversational topic or activity), and the number of utterances that were regarded as contextually appropriate. In general all the children showed more eye contact and turn-taking behaviour as well. However, the results report social improvement, but two of the three children failed to achieve mastery in a number of the tasks.

Summary of Child-specific training

Child-specific interventions, particularly those supported by behavioural mechanisms have demonstrated promising results. However, when they are administered independently, they have limited potential, as many of the interventions focus solely on social initiation. Also, social skills training itself does not appear to be

particularly reinforcing for individuals with autism. As such, if the skills cannot be maintained and/or mastered, these techniques may be limited.

Adult-Child training

Historically, much of the earlier research in this area concentrated on adult-child interactions, more specifically, young children with autism and their parents. Parents were trained to interact with the young child with autism, and outcome measures showed promising results. Such studies reported increased skills in gaze to the mother's face, number of toys played with, and number of play schemes used (Dawson & Galpert, 1990). Rogers et al., (1986) reported results which included improved social function including social-communicative play levels with a familiar adult, an increase in child positive affect and social initiations and increased tolerance of mother initiation in mother-child play.

Play scripts have also been used to teach play skills (Goldstein & Cisar, 1992). Krantz and McClannahan (1993) reported that as scripts are faded, unscripted initiations by the individuals with autism increased to within the same range displayed by a normative sample of three typically developing children. Similar results were also found with adolescents with autism (Stevenson et al., 2000). Krantz and McClannahan (1998) reported that the procedure of fading the scripts instigated spontaneous initiation in three preschoolers with minimal reading skills, and the skills generalised to activities that had not been the focus of teaching. Specifically, the script fading procedure facilitated the children's ability to converse with adults, benefit from adult's language models, and to engage in language practices that contribute to fluency. However, the increased parent-child interactions did not generalise to peer-child interactions (Rogers, 2000).

Peer-child training

Peer mediated training packages form the most substantial evidence base for social interventions with individuals with autism. These interventions have been highly influenced by the work of Strain et al., over the past 20 years. Peer-mediated approaches widened the view of social skills training and encouraged improving a number of the social deficits rather than just child initiation. Interestingly, when compared, peer-mediated training encouraged higher peer initiation rates than child-specific training (Odom & Strain, 1986).

Children with autism may make and receive fewer social initiations, react less to initiations, and conduct shorter bursts of interactions, but on occasion they do try to participate in social interactions with their peers (Kennedy & Shukla, 1995).

However, it is noted that without intervention, the simple co-location of children with autism with typically developing peers does not produce an increase in social interaction (Laushey & Heflin, 2000; Myles et al., 1993). Hence, peer-mediated approaches have focused on training socially skilled peers to facilitate social learning in children with autism.

Research into the training of peers has become increasingly sophisticated, and as such, indications of what variables increase the likelihood of social interaction within these groups have been identified; (1) Group numbers - Mundschenk and Sasso (1995) specifically targeted the number of peers that needed to be involved to facilitate social interaction. They trained five typically developing peers to work with one child with autism, and reported that only after the third peer received the training did interactions generalise for the individual with autism. (2) Age of trainers - The age of the peer co-working with the individuals with autism has also been investigated.

Lord and Hopkins (1986) reported that children with autism made more initiations to older peers, responded to a higher proportion of their initiations, and engaged in more sustained social interactions. (3) Frequency of exposure - Daily exposure to peer play sessions can significantly increase the number of social behaviours for individuals with autism, including appropriate play, proximity, time spent looking at peer, and time engaged socially. These effects can then also be generalised to new peers (Lord & Hopkins, 1986). (4) Structure of session - the greater the structure incorporated into the play sessions the greater the effect on social interactions; the structure can be imposed either by the play materials or by the trained peer (Lord & Magill-Evans, 1995).

One of the main assets of peers being trainers is that the training can be continuous throughout the entire school day rather than focusing on discrete trials. Research has also suggested that peer tutors can be more effective at increasing social interaction than teacher-led instruction (Dugan et al., 1995; Kamps et al., 1994). Kohler et al., (2001) presented the first experimental evidence of across-the-day peer mediated interventions for children with autism. Results showed an increase in interaction in the technical assistance phase, and two of the four children continued to show high levels of interaction during the maintenance phase.

Laushey and Heflin (2000) continued this method by introducing a peer buddy system to build social interactions with two preschool children with autism. Within this training the individual with autism was assigned a daily buddy who remained with the individual throughout the day and played and talked with them. The results showed an increase in asking for an object and responding according to the answer given, waiting turns, gaining attention of others appropriately, and looking at or in the

direction of a person talking. Peer buddies were interchangeable in this study enhancing maintenance of the skills across peers. Follow-up data on one participant demonstrated generalisation to another classroom, but follow-up data were not taken on the other participant.

Often, peer-mediated interventions involve the peer learning to initiate play with a target child by sharing, helping and giving affection and praise whilst playing with typical activities. Adults then reinforce the peers for their work, and the reinforcement is then systematically reduced. Outcome measures report an increase in social engagement and responsiveness, and an increase in constructive play. The outcomes are generalisable and are maintained at follow-up (Goldstein et al., 1992; Odom et al., 1999). Peer-mediated interventions have also demonstrated powerful treatment effects across a number of children, investigators, and intervention variations.

Strain and Danko (1995) revealed that parents could be taught peer-mediated approaches, and in turn teach siblings at home. This interaction has subsequently improved child-sibling interactions. Coe et al., (1991) found similar results. This finding is particularly important, as many studies focus solely on improving social interactions within the teaching rather than home environment. For true social competency children with autism are either going to have to be taught skills which can be generalised from one environment to another or learn the same social skills in varying environments as in the study by Coe et al., (1991).

Peer-mediated approaches do not only have to train generalisation to the individuals with autism but to the peers as well. Shafer et al., (1984) trained peers who had a mild learning disability to increase interactive toy play with four children with autism. The intervention elicited increased responses and initiations that were

maintained over time. In addition, the skills demonstrated by the peers generalised to two untrained peers when they became involved in the play sessions. However, the peers tended to deliver the intervention to the specific child they had been working with rather than generalise it to the other individuals with autism. Sainato et al., (1992) reported that untrained peers were more likely to acquire the skills if there were multiple peers involved in the training. Multiple trained peers can also ensure that the peers maintain the skills (Brady et al., 1987).

Pivotal response training (PRT) has been used in conjunction with peer-mediated interventions, and this training works on the principle that by changing a pivotal behaviour, other associated behaviours that have not been targeted will also change. Studies involving PRT have only focused on children over the age of eight years, and within this peer group PRT has initially achieved promising results i.e. increased amounts and complexity of sociodramatic play that generalised across settings, increased appropriate language, decreased inappropriate language, increased appropriate social engagement, and decreased inappropriate behaviour (Thorp et al., 1995). Results have also reported a rapid increase in maintaining social interactions that generalise across people, settings, and materials and the results were maintained over a two-month follow up period (Koegel & Frea, 1993; Pierce & Schreibman, 1997). Conversely, Stahmer (1995) compared symbolic play training and language training – using pivotal response techniques. The results demonstrated an increase in the targeted symbolic play skills, and increased positive responses to adult initiations within the symbolic play but not within the language training. Although the results generalised over other settings and adults, the skills could not be generalised to peers.

This again suggests that generalisation across individuals is a particularly difficult skill to achieve.

Peer tutoring with incidental teaching has been used across a wider age range - both preschool and older children with autism. Incidental teaching was designed to elaborate spontaneous speech by waiting for the individual with autism to open a conversation, then request more language, acknowledge the child's elaboration and then provide the child with a highly preferred activity. The results have shown that this type of intervention can promote the spontaneous use of target language skills (McGee et al., 1985) and can enhance social interaction responses that are not the targets of behaviour (Farmer-Dougan, 1994; Kamps et al., 1994; McGee et al., 1992). This approach can also reportedly maximize opportunities to teach demands or requests (Sundberg & Partington, 1999). However, again the evidence does not suggest that this technique generalises to other situations and few studies have collected follow-up data.

Summary of peer-child training

The results of peer-mediated training studies appear very promising, with effects across children, intervening peers and intervention variations. Few studies have investigated whether these skills are maintained over time, transfer to untrained peers/others and generalise across settings. Most follow-up studies are carried out within 12 months – therefore longitudinal effects are rarely recorded.

Class wide training

Social skills groups have been an integral part of the 'Treatment and Education of Autistic and related Communication handicapped CHildren' (TEACCH) programmes for over 10 years. Social skills groups have been arranged in playgroups

and schools. Kamps et al., (1992) used social skills instruction in a playgroup with 11 typically developing peers and three high-functioning older children with autism. The individuals with autism were assigned to a group with three typically developing children, and were encouraged to interact on a daily basis. The social skills training package comprised of ten minutes social skills training followed by ten minutes of play with a specific activity. The outcome data reported that the individuals with autism had a significant increase in social skills, length of interactions, and consistency of response. These results maintained across time. Within the adolescent population, this strategy has also been useful in teaching individuals with autism about theory of mind (Ozonoff & Miller, 1995).

Haring and Breen (1992) reported on a social support network that was designed to support an adolescent with autism within a school setting. Peers who volunteered to support the individual attended a 30-minute group meeting each week to plan the social interventions that would be used. Each peer received training on how to initiate, prompt and praise the individual with autism. Each interaction occurred during the period of class changes. The individual with autism was taught the names and photographs of each of the peers in the network. The design included a self-management system after the 20th day to reward social interactions with peers. The rewards were systematically reduced when interactions were obtained. The loss of reinforcement did not affect the level of engagement. This study reported an increase in the quality and quantity of social interactions with peers and claimed that it promoted friendships.

As an aside from the targeted areas within social skills packages, several of the class wide and peer interventions have reported an increase in peer acceptance

(Haring & Breen, 1992). Studies have reported that even after the removal of adult reinforcement, typically developing peers maintained significantly increased rates of social initiations to the children with autism (Kamps et al., 1994; McGee et al., 1992).

Social skills training involving the entire class has also produced positive results. Kamps et al., (1992) taught an entire first-grade class (including three boys with autism) social skills i.e. initiating, responding to and sustaining interactions, sharing, turn taking, conversations, giving and getting help. Results reported positive changes throughout the whole class, though no follow-up study was completed to assess either class relations or social skills improvement over time.

Methodological considerations

The literature suggests that individuals with autism are relatively responsive to a number of treatment interventions. Researchers must be mindful when comparing the success of current interventions with earlier work as diagnostic criteria have changed. In recent years many interventions have been guided by the DSM-IV (American Psychiatric Association, 1994) and ICD-10 (World Health Organisation, 1992) guidelines, but prior to this there were differing diagnostic standards (Schopler et al., 1993), therefore earlier interventions may include less rigid inclusion criteria. Also, most studies include methodological flaws such as small sample sizes and/or variable success with generalisation across settings and people, which limit the findings. Follow-up studies are rare, and where these have been included, results are not encouraging (Koegel et al., 1992; Odom et al., 1985; Odom & Strain, 1986). However, the decline in skills is unsurprising considering that social interactions for many young children with autism are not an activity of choice (McConnell, 2002). It

is possible that they are learning the 'task not the ability' (Chin & Bernard-Opitz, 2000).

There is clear evidence that when individuals with autism are interested in a topic they are capable of excessive amounts of learning (Attwood, 1998). Indeed that level of interest can sometimes become obsessive. Therefore the notion that individuals with autism are not learning mastery of social skills, or are having difficulty maintaining social skills may suggest that this is not necessarily a social skills deficit. It is possibly a motivational deficit.

In light of this, more recent research has tried to establish the most powerful factors that would influence a child to be motivated to socially interact. The research has tried to establish both internal and external reinforcers that could facilitate this learning. Although the research is relatively new, the results are encouraging.

Factors which support social interaction

Research suggests that preschool children with autism tend to engage in more social interaction around preferred activities (Koegel et al., 1987). Baker et al., (1998) acknowledged this finding and creatively used topics or themes (i.e. obsessive topics), to motivate three children with autism, to produce a socially appropriate game. The results reported an increase in social interaction throughout intervention and follow-up. There was a positive effect in both target children and peers during interactions, and the skills generalised to other activities. The authors reported that by including themes that are the source of obsessive behaviours into the games, the activity becomes intrinsically reinforcing and is therefore capitalizing on the child's interests to make them a valued member of their peer group. This research has been further evaluated and has consistently produced positive results (Baker, 2000).

A further factor that supports social interaction is the predictability of the activity and materials (Ferrara & Hill, 1980). This factor also feeds into this population's comfort with highly structured activities (DeKlyen & Odom, 1989). In light of this, video-modelling techniques have been used to teach conversational skills to school-aged children with autism, as watching videos is often an activity of choice for this population. Charlop and Milstein (1989) showed three high functioning boys with autism a videotape of simple and appropriate conversations with an adult. The outcome showed that all children rapidly acquired reciprocal conversational speech from these scripts. Furthermore the improvements generalised to other people and topics, which was maintained over a 15-month follow-up period. Further research showed that children with autism learned faster and were more able to generalise when they observed developmental skills through video modelling rather than live people modelling (Charlop-Christy et al., 2000). Wert and Neisworth (2003) used video self-modelling to teach four children with autism to make spontaneous requests in school. The programme included observation and imitation of the child's own behavior on videotape that recorded specific desirable behaviours. The outcome included an increase in spontaneous requesting. Many studies using video training have also reported the generalisability of such techniques (Charlop-Christy & Daneshvar, 2003; Kinney et al., 2003). Other advantages have been the lack of need for experimenter-implemented reinforcement or correction procedures (D'Ateno et al., 2003). The notion that individuals with autism may feel more comfortable and may learn more quickly from electronic devices rather than people has quickly become a focus area for general training in autism.

The future of social skills training

The literature suggests that an activity has to be high preference, predictable, and highly structured to achieve maximum training effects for this population. The literature also supports the notion that individuals with autism are fascinated and highly entertained by inanimate objects i.e. puzzles, and stimulating objects/activities i.e. videos and computers. This is further supported by recent qualitative research that has highlighted that individuals with autism are motivated to socially interact using the e-mail system (Jones et al., 2001). The relationship between computers and social skills training packages is the obvious next step for empirical investigation, as computers create a stable, predictable and safe environment in which to learn (Swettenham, 1996).

Paradoxically, the evidence base for computer training with this population reported potential benefits on interaction and attention over two decades ago (Panyan, 1984), but little research was generated at that time. Gradually researchers have become increasingly aware of the potency of computers in training individuals with autism. Parents have commented on the fascination and good learning rates that they have observed in their children when being taught with the computer (Bernard-Opitz et al., 2001). Computer-based training may remove the unpredictability for individuals with autism and promote a safe environment to learn and practise the rules (Parsons & Mitchell, 2002; Swettenham, 1996). A further strength of this type of training is that computers also have more control over distractions from the environment and control over the sensory input to the participant (Wilson et al., 1998). In addition, computer-based repetition is less fatiguing and more consistent than with a person repeating a task (Cromby et al., 1996).

Computer-based programs have successfully been used with individuals with autism to increase skills in a few areas:

Reading and communication skills. Heimann et al., (1995) reported that as the computer program was designed to give instantaneous feedback with onscreen animations and videodisc material, a significant increase in enjoyment was noted in the autism group.

Vocabulary acquisition. Moore and Calvert (2000) compared computer programs to behavioural programmes, where the computer programs added interesting sounds and object movement. The results indicated that children with autism were more attentive, motivated, and learned more vocabulary with the computer program than the behavioural programme.

Fundamental learning within a school environment. Bernard-Opitz et al., (1990) compared computer-aided learning with personal instruction. The results concluded that six of the nine individuals with autism in the computer-based learning improved their scores, whereas only one of the nine individuals with the personal instructor improved their scores.

Baron-Cohen (2003) has also created a computer-based emotions program 'Mind Reading: The Interactive guide to Emotion'. The program was designed to help individuals with autism to study emotions and learn the meanings of facial expressions and tone of voice. The training includes six people who demonstrate a range of 412 distinct emotions. The effects of the program are still under evaluation.

However, the literature in support of computer-based social skills training is still very sparse. It seems logical that the complicated and unpredictable social rules included in all social skills packages can be presented in a structured and predictable

manner on a computer. Yet, only one study has focused on training social skills with computers (Bernard-Opitz et al., 2001).

Bernard-Opitz et al., (2001) reported that children with autism are relatively skilled in responding to visual cues such as pictures and animation, and developed a computer-program to assist children with autism in social problem solving skills. Eight preschool children with autism (IQs all within normal range) and eight typically developing children were used for matched controls. Eight distinct social problems were presented (four 'easy' and four 'difficult') along with a choice of possible solutions – participants could also generate their own 'novel' problem solving answers. Correct answers were reinforced either by a sensory or a natural reinforcer. The results indicated that computer based programs effectively taught the children with autism social problem solving skills. Children with autism generated significantly lower numbers of 'novel' ideas – though some of the participants with autism generated more 'novel' ideas as the training progressed. On an observational level the authors reported that the children with autism enjoyed the program whereas the typically developing preschoolers appeared bored in the later sessions of the study.

The authors acknowledge that the sample of children with autism was not representative, as they all had IQs within normal range (accounting for only 25% of the autistic population). Further limitations include the fact that the study did not assess whether the skills transferred to real life settings and whether the skills maintained over time. Although this study incorporates many of the methodological flaws outlined in previous social skills studies, it has two powerful extra key factors – motivation and high engagement.

Some authors have claimed that professionals must exercise caution when using computer-based programs for teaching, as it may fuel the obsessive behaviours in autism and encourage a more reclusive style of learning (Howlin, 1998; Latash, 1998). However, the first target in social skills training has to be the successful acquisition of social skills in a non-aversive manner. It would appear that computer-based training packages might be able to deliver this goal. Naturally the second target is for the acquired skills to generalise across settings and people. With this in mind, future computer-based studies may have to consider how to transfer the skills from computers to real life settings.

Conclusions

Overall, within the field of autism, there is some evidence that short-term gains can be made from specific training attempts but the evidence is not particularly strong. More recent research has endeavoured to understand how to engage and motivate this population. Through this growing understanding, the literature has been able to move towards working with the strengths of this population rather than working with their weaknesses.

A small but compelling evidence base has been generated which advocates the unthreatening and predictable nature of computer-based training to support this population in skills training. Computer-based training packages are still in the preliminary stages, especially within the social skills training arena. However, it is conceivable that computer-based training may be able to transform a previously low preference activity to an activity of choice. If so, the improvement in social competency for this population could be significantly increased.

References:

American Psychiatric Association. (1994) *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington DC: Author.

Asperger, H. (1944) Die "autistischen psychopathen" in kind esalter. *Psychiatrie und Nervenkrankheiten*, 117, 76-136.

Attwood, T. (1998) *Asperger syndrome: A guide for parents and professional*. London: Jessica Kingsley Publishers.

Baker, M.J. (2000) Incorporating the thematic ritualistic behaviors of children with autism into games: Increasing social play interactions with siblings. *Journal of Positive Behavior Interventions*, 2, 66-84.

Baker, M.J., Koegel, R.L. & Koegel, L.K. (1998) Increasing the social behavior of young children with autism using their obsessive behaviours. *Journal of the Association for Persons with Severe Handicaps*, 23(4), 300-308.

Baron-Cohen, S. (2003) Mind Reading: The Interactive guide to Emotion (online).

Available: .

Baron-Cohen, S. (1995) Theory of Mind and face processing: How do they interact in development and psychopathology? In D. Cicchetti (Ed.) D. J. Cohen (Ed.), *Developmental Psychopathology, Vol 1: Theory and methods. Wiley series on personality processes* (pp. 343-356). John Wiley & Sons: Oxford.

Baron-Cohen, S. (1989) The autistic child's theory of mind: A case of specific developmental delay. *Journal of Child Psychology and Psychiatry and Allied Disciplines, 30(2)*, 285-297.

Baron-Cohen, S., Leslie, A.M. & Frith, U (1985) Does the autistic child have a "Theory of Mind"? *Cognition, 21(1)*, 37-46.

Belchic, J.R. & Harris, S.L. (1994) The use of multiple peer exemplars to enhance the generalization of play skills to the siblings of children with autism. *Child & Family Behavior Therapy, 16*, 1-25.

Bernard-Opitz, V., Ross, K. & Tuttas, M.L. (1990) Computer assisted instruction for autistic children. *Ann Acad Med Singapore, 19(5)*, 611-616.

Bernard-Opitz, V., Sriram, N. & Nakhoda-Sapuan, S. (2001) Enhancing social problem solving in children with autism and normal children through computer-assisted instruction. *Journal of Autism and Developmental Disorders, 31 (4)*, pp 377-384.

Brady, M.P., Shores, R.E., McEvoy, M., Ellis, D. & Fox, J.J. (1987) Increasing social interactions of severely handicapped autistic children. *Journal of Autism and Developmental Disorders*, 17, 375-390.

Carr, A.(1999). *The handbook of child and adolescent clinical psychology: A contextual approach*. London: Routledge.

Charlop, M.H. & Milstein, J.P. (1989) Teaching autistic children conversational speech using video modelling. *Journal of Applied Behavioral Analysis*, 22, 275-285.

Charlop-Christy, M.H. & Daneshvar, S. (2003) Using video modelling to teach perspective taking to children with autism. *Journal of Positive Behavior Interventions*, Vol 5(1), 12-21.

Charlop-Christy, M.H., Le, L. & Freeman, K.A. (2000) A comparison of video modelling with in vivo modelling for teaching children with autism. *Journal of Autism and Developmental Disorders*, 30 (6), 537-552.

Chin, H.Y. & Bernard-Opitz, V. (2000) Teaching conversation skills to children with autism: Effect on the development of a theory of mind. *Journal of Autism & Developmental Disorders*, Vol 30(6), 569-583.

Coe, D.A., Matson, J.L., Craigie, C.J. & Gossen, M.A. (1991) Play skills of autistic children: Assessment and instruction. *Child & Family Behavior Therapy*, 13, 13-40.

Cromby, J. J., Standen, P.J. & Brown, D.J. (1996) The potentials of virtual environments in the education and training of people with learning disabilities. *Journal of Intellectual Disability Research*, 40, 489-501.

Damasio, A.R. & Maurer, R.G. (1978) A neurological model for childhood autism. *Archives of Neurology*, 35(12), 777-786.

D'Ateno, P., Mangiapanello, K. & Taylor, B.A. (2003) Using video modelling to teach complex play sequences to a preschooler with autism. *Journal of Positive Behavior Interventions*, Vol 5(1), 5-11.

Davis, C.A., Brady, M.P., Hamilton, R. & McEvoy, M.A. (1994) Effects of high-probability requests on the social interactions of young children with severe disabilities. *Journal of Applied Behavior Analysis*, 27, 619-637.

Dawson, G. & Galpert, L. (1990) Mothers' uses of imitative play for facilitating social responsiveness and toy playing in young autistic children. *Development and Psychopathology*, 2, 151-162.

DeKlyen, M. & Odom, S.L. (1984) Activity structure and social interactions with peers in developmentally integrated play groups. *Journal of Early Intervention*, 13, 342-352.

Dugan, E.P., Kamps, D.M., Leonard, B.R., Watkins, N., Rheinberger, A. & Stackhaus, J. (1995) Effects of cooperative learning groups during social studies for students with autism and fourth grade peers. *Journal of Applied Behavioral Analysis, 28*, 175-188.

Farmer-Dougan, V. (1994) Increasing requests by adults with developmental disabilities using incidental teaching by peers. *Journal of Applied Behavior Analysis, 27*, 533-544.

Ferrara, C. & Hill, S.D. (1980) The responsiveness of autistic children to the predictability of social and nonsocial toys. *Journal of Autism and Developmental Disorders, 10*, 51-57.

Frith, U. & Happe, F. (1994) Autism: Beyond "Theory of Mind". *Cognition, 50(1-3)*, 115-132.

Goldstein, H. & Cisar, C.L. (1992) Promoting interaction during sociodramatic play: Teaching scripts to typical preschoolers and classmates with disabilities. *Journal of Applied Behavior Analysis, 25*, 265-280.

Goldstein, H., Kaczmarek, L., Pennington, R. & Shafer, K. (1992) Peer-mediated intervention: Attending to, commenting on, and acknowledging the behavior of preschoolers with autism. *Journal of Applied Behavior Analysis, 25*, 289-305.

Haring, T.G. & Breen, C.G. (1992) A peer-mediated social network intervention to enhance the social integration of persons with moderate and severe disabilities. *Journal of Applied Behavior Analysis*, 25, 319-333.

Heiman, M., Nelson, K. E., Tjus, T. & Gillberg, C. (1995) Increasing reading and communication skills in children with autism through an interactive multimedia program. *Journal of Autism and Developmental Disorders*, 25, pp 459-480.

Hobson, R. (1993) *Autism and the development of mind*. Hillsdale NJ: Lawrence Erlbaum.

Hobson, R.P., & Lee, A. (1998) Hello and goodbye: A study of social engagement in autism. *Journal of Autism and Developmental Disorders*, 28, 117-127.

Howlin, P. (1997) *Autism: Preparing for adulthood*. Routledge: London.

Howlin, P. (1998) Practitioner review: psychological and educational treatments for autism. *Journal of Child Psychology and Psychiatry*, 39, 307-322.

Jarrold, C. (1997) Pretend play in autism: Executive explanations. In J. Russell (Ed.), *Autism as an Executive Disorder* (pp.101-140). Oxford University Press: London.

Jones, R.S.P., & Zahl, A. & Huws, J. (2001) A qualitative analysis of first-hand accounts of emotional experiences in Autism. *Disability and Society*, 16, 3, 393-401.

Kamps, D.M., Barbetta, P.M., Leonard, B.R. & Delquadri, J. (1994) Classwide peer tutoring: An integration strategy to improve reading skills and promote peer interactions among students with autism and general education peers. *Journal of Applied Behavior Analysis, 27*, 49-61.

Kamps, D.M., Leonard, B.R., Vernon, S., Dugan, E.P. & Delquadri, J.C. (1992) Teaching social skills to students with autism to increase peer interactions in an integrated first-grade classroom. *Journal of Applied Behavior Analysis, 25*, 281-288.

Kanner, L. (1943) Autistic disturbances of affective contact. *Nervous Child, 2*, 217-250.

Kennedy, C.H. & Schukla, S. (1995) Social interaction research for people with autism as a set of past, current, and emerging propositions. *Behavioral Disorders, 21*, 21-35.

Kinney, E.M., Vedora, J. & Stromer, R. (2003). Computer-presented video models to teach generative spelling to a child with an autism spectrum disorder. *Journal of Positive Behavior Interventions, Vol 5(1)*, 22-29.

Koegel, L.K., Koegel, R.L., Hurley, C. & Frea, W.D. (1992) Improving social skills and disruptive behavior in children with autism through self-management. *Journal of Applied Behavioral Analysis, 25*, 341-353.

Koegel, R.L., Dyer, K. & Bell, L.K. (1987) The influence of child-preferred activities on autistic children's social behavior. *Journal of Applied Behavior Analysis*, 20, 243-252.

Koegel, R.L. & Frea, W.D. (1993) Treatment of social behavior in autism through the modification of pivotal social skills. *Journal of Applied Behavior Analysis*, 26, 369-377.

Kohler, F.W., Anthony, L.J., Steighner, S.A. & Hoyson, M. (2001) Teaching social interaction skills in the integrated preschool: An examination of naturalistic tactics. *Topics in early childhood special edition, Vol 21(2)*, 93-103.

Krantz, P.J. & McClannahan, L.E. (1993) Teaching children with autism to initiate to peers: Effects of script-fading procedure. *Journal of Applied Behavior Analysis*, 26, 121-132.

Krantz, P.J. & McClannahan, L.E. (1998) Social interaction skills for children with autism: A script fading procedure for beginning readers. *Journal of Applied Behavior Analysis*, 31, 191-202.

LaLonde, C. E. & Chandler, M.J. (1995) False-belief understanding goes to school: On the social-emotional consequences of coming early or late to a first theory of mind. *Cognition and Emotion*, 9, 167-185.

Latash, M.L. (1998) Virtual reality: a fascinating tool for motor rehabilitation (to be used with caution). *Disability and Rehabilitation*, 20, 104-105.

Laushey, K.M. & Heflin, J. (2000) Enhancing social skills of kindergarten children with autism through the training of multiple peers as tutors. *Journal of Autism and Developmental Disorders*, 30, 183-193.

Lord, C. & Hopkins, J.M. (1986) The social behavior of autistic children with younger and same-age nonhandicapped peers. *Journal of Autism and Developmental Disorders*, 16, 249-262.

Lord, C. & Magill-Evans, J. (1995) Peer interactions of autistic children and adolescents. *Development and Psychopathology*, 7, 611-626.

McConnell, S.R. (2002) Interventions to facilitate social interaction for young children with autism: Review of available research and recommendations for educational intervention and future research. *Journal of Autism and Developmental Disorders*, 32(5), 351-372.

McConnell, S.R., Sisson, L.A., Cort, C.A. & Strain, P.S. (1991) Effects of social skills training and contingency management on reciprocal interaction of preschool children with behavioural handicaps. *Journal of Special Education*, 24, 473-495.

McEvoy, R., Rogers, S.J. & Pennington, B.F. (1993) Executive function and social communication deficits in young autistic children. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, 34(4), 563-578.

McGee, G.G., Almeida, M.C., Sulzer-Azaroff, B. & Feldman, R.S. (1992) Promoting reciprocal interactions via peer incidental teaching. *Journal of Applied Behavior Analysis*, 25, 117-126.

McGee, G.G., Krantz, P.J. & McClannahan, L.E. (1985) The facilitative effects of incidental teaching on preposition use by autistic children. *Journal of Applied Behavior Analysis*, 18, 17-31.

McGee, G.G., Morrier, M.J. & Daley, T. (1999) An incidental teaching approach to early intervention for toddlers with autism. *Journal of the Association for Persons with Severe Handicaps*, 24, 133-146.

Moore, M. & Calvert, S. (2000) Brief report: Vocabulary acquisition for children with autism: Teacher or computer instruction. *Journal of Autism and Developmental Disorders*, 30 (4), pp 359-362.

Mundshenk, N.A. & Sasso, G.M. (1995) Assessing sufficient exemplars for students with autism. *Behavioral Disorders*, 21, 62-78.

Myles, B.S., Simpson, R.L., Ormsbee, C.K. & Erickson, C. (1993) Integrating preschool children with autism with their normally developing peers: Research findings and best practices recommendations. *Focus on Autistic Behavior*, 8, 1-8.

Odom, S.L., Hoyson, M., Jamieson, B. & Strain, P.S. (1985) Increasing handicapped preschoolers' peer social interactions: Cross-setting and component analysis. *Journal of Applied Behavior Analysis*, 18, 3-16.

Odom, S.L., McConnell, S.R., McEvoy, M.A., Peterson, C., Ostrsky, M., Chandler, L.K., Spicuzza, R.J., Skellenger, A., Creighton, M. & Favazza, P.C. (1999) Relative effects of interventions for supporting the social competence of young children with disabilities. *Topics in Early Childhood Special Education*, 19, 75-92.

Odom, S.L. & Strain, P.S. (1986) A comparison of peer-initiation and teacher-antecedent interventions for promoting reciprocal social interaction of autistic preschoolers. *Journal of Applied Behavior Analysis*, 19, 59-71.

Ozonoff, S. & Miller, J.N. (1995) Teaching theory of mind: A new approach to social skills training for individuals with autism. *Journal of Autism and Developmental Disorders*, 25, 415-433.

Ozonoff, S., Pennington, B.F. & Rogers, S.J. (1991) Executive function deficits in High-functioning autistic individuals: Relationship to theory of mind. *The Journal of Child Psychology and Psychiatry and Allied Disciplines*, 32(7), 1081-1105.

Panyan, M.V. (1984) Computer technology for autistic children. *Journal of Autism and Developmental Disorders, 14*, 375-382.

Parsons, S. & Mitchell, P. (2002) The potential of virtual reality in social skills training for people with autistic spectrum disorders. *Journal of Intellectual Disability Research, 46 (5)*, 430-443.

Pierce, K., Glad, K.S. & Schreibman, L. (1997) Social perception in children with autism: An attention deficit? *Journal of Autism and Developmental Disorders, 27*, 265-282.

Pierce, K. & Schreibman, L. (1997) Multiple peer use of pivotal response training to increase social behaviors of classmates with autism: Results from trained and untrained peers. *Journal of Applied Behavior Analysis, 30*, 157-160.

Prior, M. & Hoffman, W. (1990) Brief report: Neuropsychological testing of autistic children through an exploration with frontal lobe tests. *The Journal and Developmental Disorders, 20(4)*, 581-590.

Rogers, S. (2000) Interventions that facilitate socialization in children with autism. *Journal of Autism and Developmental Disorders, 30 (5)*, 399-407.

Rogers, S.J., Bennetto, L., McEvoy, R. & Pennington, B.F. (1996) Imitation and pantomime in high-functioning adolescents with autism spectrum disorders. *Child Development, 67(5)*, 2060-2073.

Rogers, S.J., Herbison, J., Lewis, H., Pantone, J. & Reis, K. (1986) An approach for enhancing the symbolic, communicative, and interpersonal functioning of young children with autism and severe emotional handicaps. *Journal of the Division of Early Childhood, 10*, 135-148.

Sainato, D.M., Goldstein, H. & Strain, P.S. (1992) Effects of self-evaluation on preschool children's use of social interaction strategies with their classmates with autism. *Journal of Applied Behavior Analysis, 25*, 127-141.

Shafer, M.S., Egel, A.L. & Neef, N.A. (1984). Training mildly handicapped peers to facilitate changes in the social interaction skills of autistic children. *Journal of Applied Behavior Analysis, 17*, 461-476.

Shearer, D.D., Kohler, F.W., Buchanan, K.A. & McCullough, K.M. (1996) Promoting independent interactions between preschoolers with autism and their nondisabled peers: An analysis of self-monitoring. *Early Education and Development, 7*, 205-220.

Sigman, M. & Ruskin, E. (1999) Continuity and change in the social competence of children with autism, Down syndrome, and developmental delays. *Monographs of Society for Research in Child Development, 64*, 1-130.

Stahmer, A.C. (1995) Teaching symbolic play skills to children with autism using pivotal response training. *Journal of Autism and Developmental Disorders*, 25, 123-142.

Stevenson, C.L., Krantz, P.J. & McClannahan, L.E. (2000) Social interaction skills for children with autism: A script-fading procedure for nonreaders. *Behavioral Interventions*, 15, 1-20.

Stone, W.L., & Lemanek, K.L. (1990) Parental report of social behaviours in autistic preschoolers. *Journal of Autism and Developmental Disorders*, 20, 513-522.

Strain, P.S. & Danko, C.D. (1995) Caregivers' encouragement of positive interaction between preschoolers with autism and their siblings. *Journal of Emotional and Behavioral Disorders*, 3(1), 2-12.

Strain, P.S., Kohler, F.W., Storey, K. & Danko, C.D. (1994) Teaching preschoolers with autism to self-monitor their social interactions: An analysis of results in home and school settings. *Journal of Emotional & Behavioral Disorders*, 2, 78-88.

Sundberg, M.L. & Partington, J.W. (1999) The need for both discrete trial and natural environment language training for children with autism. In P.M.Ghezzi, W.L. Williams, & J.E. Carr (Eds.), *Autism: Behavior analytic perspectives* (pp.139-156). Reno, NV: Context.

Swettenham, J.G. (1996) Can children with autism be taught to understand false belief using computers? *Journal of Child Psychology and Psychiatry*, 37, 157-165.

Swettenham, J.G., Baron-Cohen, S., Gomez, J.C., & Walsh, S. (1996) What's inside someone's head? Conceiving of the mind as a camera helps children with autism acquire an alternative to theory of mind. *Cognitive Neuropsychiatry*, 1, 73-88.

Thorp, D.M., Stahmer, A.C. & Schreibman, L. (1995) Effects of sociodramatic play training on children with autism. *Journal of Autism and Pervasive Developmental Disorders*, 25, 265-282.

Vostanis, P., Smith, B., Corbett, J., Sungum-Paliwal, R., Edwards, A., Gingell, K., Golding, R., Moore, A. & Williams, J. (1998) Parental concerns of early development in children with autism and related disorders. *Autism*, 2, 229-242.

Wert, B.Y. & Neisworth, J.T. (2003) Effects of video self-modeling on spontaneous requesting in children with autism. *Journal of Positive Behavior Interventions*. Vol 5(1), 30-34.

Wilson, P.N., Foreman, N. & Stanton, D. (1998) A rejoinder. *Disability and Rehabilitation*, 20, 113-115.

Wimpory, D.C., Hobson, R.P., Williams, J.M.G. & Nash, S. (2000) Are infants with autism socially engaged? A study of recent retrospective parental reports. *Journal of Autism and Developmental Disorders*, 30 (6), 525-536.

Wing, L. & Gould, J. (1979) Severe impairments of social interaction and associated abnormalities in children: epidemiology and classification. *Journal of autism and developmental disorders*, 9, pp 11-29.

World Health Organisation. (1992) International statistical classification of diseases and related health problems, ICD-10, Chapter 5 (F00-F99). Geneva: Author.

Appendices

Appendix 2.1 – Authors notes

Appendix 2.1 - Authors notes for: Autism: The International Journal of Research and Practice.

Selected journal for submission: Autism: The International Journal of Research and Practice.**• Notes for Authors**

1. The aim of the journal is to publish original research or original contributions to the existing literature on autism. Papers should not previously have been published or be under consideration elsewhere
2. Each paper submitted will be refereed by at least two anonymous referees.
3. *Length of papers.* Brief reports (up to 3000 words) and more substantial reports (between 5000 and 8000 words) will be considered for the journal. There is scope for longer papers to be published on an occasional basis but please consult with the Editors before submission.
4. When submitting papers for consideration, please supply *four* paper copies. If the paper is accepted for publication, then a copy of the final version will be required on disk. *The author is responsible for guaranteeing that the final hard copy and diskette versions of the manuscript are identical.*
5. The Editors welcome contributions to the Letters to the Editors section of the journal. In the interests of saving space, or to protect confidentiality, for example, the Editors may edit letters for publication.
6. *Unsolicited manuscripts will not be returned to authors if rejected.*
7. *Blind peer review.* Authors should provide two title pages, one containing names, affiliations, full mailing address plus telephone, fax, e-mail address, and one containing the title only.
8. Please number all pages except the title pages, in the following order: abstract (100-150 words), keywords (up to five), address for correspondence; main text; appendices; acknowledgements; notes; references; tables; figure captions; figures. Each of the above sections should start on a fresh page.
9. Articles submitted for publication must be typed (or word processed) in double spacing *throughout (especially all notes and references)*, on one side of white A4 or US standard paper, with generous left-and right-hand margins but without justification. Pages should *not* be stapled. Titles and section headings should be clear and brief with a maximum of three orders of heading.
10. *Quotations.* Lengthy quotations (exceeding 40 words) should be displayed and indented in the text.

11. American or UK spelling may be used, to the author's preference. Indicate italics by underlining and use single quotation marks. Dates should be in the form '9 May 1995'. Delete points from 'USA' and other such abbreviations.
12. *Tables and figures* should have short, descriptive titles, and be clearly numbered. All footnotes to tables and their source(s) should be typed below the tables. Column headings should clearly define the data presented. Camera-ready artwork must be supplied for all figures. The location of tables and figures in the text should be given by a note 'Table/Figure X about here' on a separate line in the text.
13. *References in the text* should be presented in the Harvard system, i.e. the author's name and year of publication in brackets, together with the page number, e.g. 'As Hobson (1989, pp. 22-3) has observed...', or, in a more general reference:

'Scott (1985) appears to be saying that...'

14. *Reference list*. The references should be listed alphabetically in full at the end of the paper, typed double spaced for ease of editing, in the following style:

Happe, F. (1995) *Autism: An Introduction to Psychological Theory*. Cambridge, MA: Harvard University Press.

Hobson, R.P. (1989) 'Beyond Cognition: A Theory of Autism', in G. Dawson (ed.) *Autism: Nature, Diagnosis and Treatment*, pp. 22-8. New York: Guilford.

Sigman, M.D., Kasari, C., Kwon, J. & Yirmiya, N. (1992) 'Responses to the Negative Emotions of Others by Autistic, Mentally Retarded and Normal Children', *Child Development* 63(3): 796-807.

In multi-authored articles, the names of all authors should be given in the reference list. In the text, if there are more than two names, please give the first name and et al.

NB: (eds) as a contraction but (ed.) as an abbreviation.

15. *Language and terminology*. Jargon or unnecessary technical language should be avoided as should the use of abbreviations (such as coded names for conditions). Please avoid the use of nouns as verbs (e.g. to access), and the use of adjectives as nouns (e.g., autistics, normals or retardates). Wherever possible use phrases such as 'children with autism' rather than 'autistic children'. Language that might be deemed as sexist or racist should be avoided.
16. *Abbreviations*. As far as possible, please avoid the use of initials, except for terms in common use. Abbreviations that are common enough to be in the dictionary, e.g. IQ and USA, are acceptable, but AS (for Asperger syndrome) and SPS (for semantic pragmatic syndrome) are not. Please provide a list, in

alphabetical order, of abbreviations used, and spell them out (with the abbreviation in brackets) the first time they are mentioned in the text.

17. Authors will receive proofs of their papers and 25 offprints of the published version, plus one copy of the printed journal.
18. *Copyright.* On acceptance of their paper, authors will be asked to assign copyright to Sage Publications Ltd and the National Autistic Society, subject to retaining their right to reuse the material in other publications written or edited by themselves, and due to be published preferably at least one year after initial publication in the journal. Authors are responsible for obtaining permission from copyright holders for reproducing any illustrations, tables, figures or lengthy quotations previously published elsewhere.
19. *Typescripts.* Authors should retain one copy of their typescript and send *four copies*, each fully numbered and legible, together with all figures and tables and a covering letter. Authors from outside the Americas should send their typescripts to: Submissions Editor, *Autism: The International Journal of Research and Practice*, The National Autistic Society, 393 City Road, London, EC1V 1NG, UK. Fax: 144[0]171 833 9666; e-mail: . Authors from the Americas should send their typescripts in the first instance to: Mohammad Ghaziuddin, Division of Child Psychiatry, Taubman Center, Box 0390, University of Michigan Medical Center, 1500 East Medical Center Drive, Ann Arbor, MI 48109-0390, USA. Fax 11[313]936 8907; email:
20. *Reviews.* Books and suggestions should be sent to the Reviews Editor: Tony Charman, The Behavioural Sciences Unit, Institute of Child Health, 30 Guilford Street, London WC1N 1EH. Email:
21. *Covering letter.* Please attach to every submission a letter confirming that all authors have agreed to the submission and that the article is not currently being considered for publication by any other print or electronic journal.

SOCIAL SKILLS IN ADOLESCENTS WITH AUTISM: TESTING THE SPECIFICITY OF THE DEFICIT, AND DEVELOPMENT OF A DVD TRAINING INTERVENTION.

Katie Haddock

Department of Clinical Psychology, University of Wales, Bangor, Gwynedd, LL57 2DG

Dr Robert Jones

Clinical Psychologist, University of Wales, Bangor, Gwynedd, LL57 2DG

Dr Steve Noone

Clinical Psychologist, Learning Disabilities Service, North-West Wales NHS Trust, Llanfairfechan, Gwynedd, LL33 OHH

**Please address all correspondence to: Katie Haddock
Clinical Psychology Department
Brigantia Building
43 College Road
Bangor
Gwynedd
Wales
LL57 2DG**

Running Head – Social skills training in autism

Journal prepared for submission to: Journal of Autism and Developmental Disorders. Please refer to Appendix 3.1 for notes for the author.

Abstract

The current study compared 14 individuals with ASD, 10 individuals with no disabilities (ND) and eight individuals with mental retardation (MR) on ability to judge the social appropriate/inappropriateness of 12 scenarios on DVD. Eight individuals with ASD were then trained with six of the previous scenarios and eight new scenarios. Both ASD groups were then re-tested using the original 12 scenarios. The results reported that individuals with ASD were significantly worse than individuals with MR or ND at identifying appropriate/inappropriate social scenarios. The severity of autistic symptoms negatively impacted on performance. The trained group significantly improved their scores on both trained and untrained scenarios.

Keywords: Social skills training; Autistic Spectrum Disorder; Computer-based training; DVD training.

Introduction

Since Kanner's (1943) original diagnostic criteria, social impairment has been considered an essential component of autistic spectrum disorder (ASD). The 'Triad of Impairments' (Wing & Gould, 1979) has guided more recent diagnostic criteria. This classification system affords 'socialisation' a category of its own. Socialisation difficulties within the autistic population can include: (i) problems or lack of interest in mixing with peer group, (ii) problems with understanding the subtleties of social situations, (iii) inappropriate social or emotional responses, and (iv) resistance to changes in routine (Attwood, 1998). The social impairment is autism specific rather than attributable to a more general mental retardation (Pierce, Glad & Schreibman, 1997; Sigman & Ruskin, 1999; Vostanis et al., 1998).

The effects of social impairment can include delay in long-term development of social behaviour, which subsequently can widen the developmental gap between children with autism and their typically developing peers (McGee, Morrier, & Daley, 1999). The lack of understanding of others can negatively impact on the forming and maintaining of relationships and employment, and can often lead to social exclusion (Howlin, 1997).

Cognitive theories such as Theory-of-mind (ToM) (Baron-Cohen, Leslie & Frith, 1985) Weak central coherence theory (Frith & Happe, 1994), Executive dysfunction (Ozonoff, Pennington & Rogers, 1991), have led to an understanding of the factors which contribute to these social deficits. Though few of the cognitive theories suggest possible intervention strategies.

Behavioural and environmental strategies have evolved over the past few decades to try and facilitate social competency with this population. Research has

shown reasonable treatment effects through a number of intervention designs: child-specific training (Belchic & Harris, 1994; Davis, Brady, Malmilton & McEvoy, 1994; Koegel, Koegel, Hurley & Frea, 1992), adult-child training (Dawson & Galpert, 1990; Rogers, Herbison, Lewis, Pantone & Reis, 1986), peer-child training (Dugan et al., 1995; Goldstein, Kaczmarek, Pennington & Shafer, 1992; Kamps, Barbetta, Leonard & Delquadri 1994; Kohler, Anthony, Steighner & Hoyson, 2001; Odom et al., 1999) and class wide training (Kamps, Leonard, Vernon, Dugan, & Delquadri, 1992). Yet many of the studies have reported a reduction in the acquired skills when the intervention or reinforcers are removed (Koegel et al., 1992; Odom, Hoyson, Jamieson, & Strain 1985; Odom & Strain, 1986). Therefore research has focused on motivators to encourage both increased attention and maintenance of skills within this population.

Researchers have identified that the inclusion of natural motivators within activities can promote learning. Baker, Koegel and Koegel (1998) utilised the obsessional tendencies of individuals with autism by incorporating obsessive topics and themes, to motivate three children with autism, to produce a socially appropriate game. The results reported an increase in social interaction, which was maintained at follow-up and which generalised to other activities. The authors reported that this inclusion capitalised on the child's interests to make them a valued member of their peer group. This research has been further evaluated and has consistently produced positive results (Baker, 2000).

External reinforcers often include mechanical or electrical objects, namely videos, DVDs, and computers. Observational accounts by parents have reported the reinforcing nature of computer-based activities for individuals with ASD (Bernard-

Opitz, Sriram & Nakhoda-Sapuan, 2001). In relation to social contact, recent qualitative research has also reported that individuals with ASD are comfortable socially interacting over the e-mail system (Jones, Zahl & Huws, 2001). Researchers have reported that computers can create a stable, predictable and safe environment in which to learn for individuals with autism (Swettenham, 1996). As social skills are so complex and subtle, a straightforward, predictable training package on the computer may make training less stress inducing and more tangible for this population.

Computer-based packages have successfully trained individuals with ASD in a number of skills; Reading and communication skills - Heimann, Nelson, Tjus & Gillberg, 1995; Vocabulary acquisition - Moore & Calvert, 2000; Fundamental learning within a school environment - Bernard-Opitz, Ross & Tutas, 1990). However, there is a sparse literature base for computer-based training in social skills.

Bernard-Opitz et al., (2001) reported the efficacy of computer-based programs for children with autism. The training comprised eight preschool children with autism (IQ 70 or above) and eight typically developing children as matched controls. Eight distinct social problems were presented (four 'easy' and four 'difficult') along with a choice of possible solutions. Correct answers were reinforced either by a sensory or a natural reinforcer. The results indicated that computer based programs effectively taught the children with autism social problem solving skills. Interestingly, on an observational level the authors reported that the children with autism enjoyed the program whereas the typically developing preschoolers appeared bored in the later sessions of the study.

Therefore social skills training would appear to be facilitated by computers, and computers effectively maintain attention and motivation within the ASD population.

However, this study concentrated on problem-solving skills, but little research to date has looked at the basic ability of individuals with autism to simply identify appropriate and inappropriate social behaviour on a computer. Such research would possibly be the first step to gaining a real understanding of the social deficits in this disorder.

The current study endeavoured to start the process from the beginning, and targeted the acquisition of social identification with the use of computer-based training as the first step towards building the evidence base. A DVD was created which displayed eight inappropriate and four appropriate social scenarios. The DVD was used to assess how successfully individuals with ASD could identify appropriate and inappropriate social behaviour in comparison to individuals with mental retardation (MR) or no disabilities (ND). The comparison groups were included to assess whether no learning disability (as identified by the ND group) or a lack of exposure to varied social experience (as measured by the MR group) were factors that influenced the results. Furthermore the study wanted to assess whether individuals with ASD could be trained to identify appropriate and inappropriate social behaviours using the DVD.

The current study sought to test the following four research predictions:

1. The MR group and ND group will perform significantly better than the ASD group in identifying appropriate and inappropriate social behaviour.

Furthermore, individuals with ND will perform significantly better than individuals with MR.

2. Within the ASD group, there will be a negative relationship between the severity of autism (as determined by the ABC scores) and ability to identify appropriate and inappropriate social behaviour.
3. Individuals with ASD can be trained to identify appropriate and inappropriate social behaviour (using the DVD scenarios), and can subsequently improve their scores on this task.
4. Following training, individuals with ASD will improve their scores on scenarios that they have been trained with and also on scenarios with which they have not been trained.

Method

Participants

Three groups of adolescents were tested in this study, all aged between 14 and 18 years. The first group included adolescents with autism. Within this group all participants were required to have an IQ of 70 or above. All participants within the autism group attended a school for children with autism. The second group comprised eight adolescents with mental retardation (MR) all of whom were required to have an IQ between 50 – 70 to meet criteria for mild mental retardation (ICD-10). All MR participants attended a special education school. The third group included ten adolescents who were non-disabled (ND) and all participants in this group required an IQ of 70 or above. All ND participants attended mainstream school.

Inclusion/Exclusion criteria

All participants were screened for autism using the modified version of the Autism Behavior Checklist (ABC; Volkmar, Cicchetti, Dykens, Sparrow, Leckman &

Cohen, 1988), which was completed by the adolescents' parents/guardians prior to participation. Each participant also completed an IQ assessment using the four subtests in the Wechsler Abbreviated Scale of Intelligence (WASI; The Psychological Corporation, 1999), prior to participation.

On the ABC, a score of 67 or above suggests that the individual has a high probability of having autism, 53-67 suggests that the individual may possibly have autism and those with scores less than 53 are unlikely to have autism. Mean standard scores (standard deviations) on the ABC were as follows: ASD participants 67.86 (40.78), ranging from 15-152; MR Participants 26.25 (21.75), ranging from 6-66; ND participants .60 (1.90), ranging from 0-6.

Mean standard scores (standard deviations) on the WASI were as follows: ASD participants 91.86 (16.58); MR participants 63 (6.74); ND participants 108 (11.04).

The participants as well as their parents/guardians gave consent for participation in this study.

Materials

Wechsler Abbreviated Scale of Intelligence (WASI; The Psychological Corporation, 1999)

The WASI is a short and reliable measure of intelligence in clinical, psycho educational and research settings. It is designed for use with individuals aged from 6 to 89, and has commonly been used to assess individuals with or without a learning disability. The WASI consists of four subtests: Vocabulary, Block Design, Similarities and Matrix reasoning. It is nationally standardised and yields the three traditional

Verbal, Performance and Full Scale IQ scores. Good test-retest reliability of .87-.92 for the IQ scales in the adult population, were found on this assessment tool.

Autism Behaviour Checklist (Modified version) (ABC; Volkmar, Cicchetti, Dykens, Sparrow, Leckman, & Cohen, 1988)

The Autism Behavior Checklist (ABC; Krug, Arick & Almond, 1980) was designed to assess the level of autism symptomatology. The validity of the ABC as a diagnostic instrument has been questioned (Sevin, Matson, Coe, Fee & Sevin, 1991; Wadden, Bryson & Rodger, 1991). However the current study only used the assessment as a screening tool. The modified version, which includes simple 'Yes/No' format (Volkmar et al., 1988) was used as a simple and reliable version for parents or teachers to complete. A good interrater reliability of 95% was found for this checklist.

For the present study, the participants overall scores rather than divided subscale scores were collected.

DVD scenarios

Eight drama students (aged 15-17) were enrolled to produce 'typical' teenage scenarios for the DVD. The scenarios were set in two social settings, a café and a clothes shop, and always included two actors interacting. The DVD contained four appropriate and eight inappropriate social scenarios. Scenarios that included no inappropriate interactions were used as control scenarios. The 'inappropriate' scenarios manipulated five social skills: eye contact, proximity, verbal reinforcement (uh-huhs and yeahs), keeping on topic and body language. The scenarios were considered 'inappropriate'

when the actors included too much or too little of the social skill. In each ‘inappropriate’ scenario, two, three or four ‘inappropriate’ social skills were included.

Expert Panel

To validate the DVD, an expert panel comprising three psychologists, (two clinical psychologists and one research psychologist), all with considerable experience in either working with or conducting research with individuals with autism were asked to score the DVD. They independently viewed the 20 social scenarios (each lasting between 30 seconds – one minute) and identified whether each was an appropriate or inappropriate social scenario. If they reported that it was an inappropriate social scenario they were further asked to identify both the actor and the individual social skills that were inappropriate. Following this, they viewed the 20 scenarios again and reached a consensus as a group on each scenario i.e. appropriate/inappropriate, which actor was making the mistakes, and what specific mistakes were being made. The final consensus determined the scoring criteria for each scenario. Twelve of the 20 scenarios were then selected and created the Phase-I scenarios; the eight remaining scenarios were kept for training purposes.

Scoring

As outlined by the expert panel, the participants scored one point for correctly answering whether it was an appropriate or inappropriate social scenario, a further point for correctly identifying the actor, and one point for each inappropriate social skill identified. In each inappropriate social scenario the participants could potentially score five points in total; however on one scenario they could potentially score six points. The participants scored two points for correctly identifying an appropriate social scenario.

Following completion of data collection 33% of the total responses were checked using the percentage agreement index and an inter-rater reliability of 96% was found.

Procedure

Ethical approval for the study was obtained from the School of Psychology Research Ethics Committee, and the North Wales Health Authority Research Ethics Committee (West, Central and East sub-committees). Schools for individuals with Autism, Special Need schools and Mainstream schools were then approached for recruitment purposes. All schools were given a copy of the information sheets and consent forms for both the parents and participants. The information sheet for parents also included the ABC for them to complete and return with the consent form. Following the parental return of the ABC and consent form the experimenter met with each participant (in conjunction with a parent or teacher) to discuss the study. Informed consent was then obtained from each participant.

Phase I

Following completion of the WASI, fourteen participants with autism, eight participants with MR and ten participants with ND were presented with 12 DVD scenarios of two people engaging in appropriate and inappropriate social interactions. Each participant was seated in front of a computer. The experimenter sat slightly to the front of each participant, to ensure that they were attending to the computer screen. The participant was informed that there were appropriate as well as inappropriate social scenarios.

The participant viewed each scenario in turn. To increase the probability that the assessment was testing social competency rather than memory, the experimenter paused the screen to ensure that the two actors were still visible throughout the questioning

process. After each scenario the participant was asked (1) is this a good or a poor interaction – if the participant reported that it was an appropriate interaction the next scenario was viewed. If they reported that it was a ‘poor interaction’ they were further asked (2) which of the two people is making the most mistakes? If they identified the wrong person the next scenario was viewed. If they identified the correct person they were asked (3) what mistakes are they making? The experimenter recorded the participant’s answers without indicating whether the participant was correct or incorrect. Each subsequent scenario was assessed in the same manner. If the participant did not attend to a DVD scenario, the experimenter gave them a verbal and gestural prompt to attend.

Phase II

Eight adolescents with autism (AD) then received training using the DVD, on how to identify appropriate and inappropriate social skills. The training involved a visual list of the five variables that had been manipulated in the DVD, and a discussion about each variable in turn. Following the discussion, each participant viewed six of the twelve scenarios used in *Phase I* (including both appropriate and inappropriate social scenarios) – each scenario was then supported with two novel scenarios, which displayed the same appropriate or inappropriate social skills but with different actors. Each scenario was presented, explained by the experimenter and then discussed with the participant. All participants were taught until they achieved 100% pass rate. If the participant correctly identified all of the inappropriate social skills in the first training scenario they still viewed the first novel scenario to reinforce the idea of looking for inappropriate social skills. However, if the participant identified all of the inappropriate social skills in the

training scenario and the first novel scenario, the researcher did not show the second novel scenario. The participant was moved on to the next scenario.

Results

Within groups, the Kolmogorov-Smirnov test assessed the data for normal distribution. All groups were normally distributed and had no outliers. Therefore the main analysis was conducted using parametric assessments.

Phase 1

Provisional analysis

The provisional analysis assessed whether age or gender influenced the results. A Pearson correlation reported that overall there was no significant correlation between age and performance. However with gender, an independent sample t-test reported an overall significant difference between males and females ($t(15) = 1.76, p = .049$), reporting that females were marginally better than males at identifying appropriate and inappropriate social behaviour.

Test Performance

The main analysis looked at performance differences between the three groups. Table 1 demonstrates the mean performance scores for each group in Phase I. A one-way between subjects analysis of variance reported that the performance differences between the three groups was highly significant ($F(2,29) = 26.79, p < .001$). To determine the specific differences between groups, three independent sample t-tests were carried out.

For all three t-tests, the Levines test for equality of variance was significant. Therefore all t-tests were conducted with adjusted degrees of freedom. The results demonstrated that the ASD group scored significantly lower than the ND group

($t(13) = 7.50, p < .001$), the autism group scored significantly lower than the MR group ($t(18) = 4.9, p < .001$), and the MR group scored marginally lower than the ND group ($t(8) = 3.6, p < .01$).

To explore whether gender differences influenced group differences, the data were analysed with an exploratory one-way analysis of covariance where gender was controlled. The group difference was still highly significant ($F(2,28) = 22.57, p < .001$). However the adjusted mean score for each group marginally differed from overall means. Table 2 reports the mean performance scores for each group in Phase I when controlling for gender.

The results, as predicted, indicated that the autism group had significantly more difficulty identifying appropriate and inappropriate social behaviour than the ND or MR group. So too, the MR group had more difficulty identifying appropriate and inappropriate behaviour than the ND group.

A Pearson correlation test demonstrated that severity of autism correlated with poor performance ($r(14) = -.83, p < .001$), highlighting that individuals with greater autistic symptomatology (as assessed by the ABC) scored lower in phase I.

Phase II

To explore whether the computer-based training package could improve the scores, the autism group was subdivided into two groups, and eight individuals were selected for further training (AD). The six untrained individuals from the autism group acted as waiting-list controls (AC). Following training both autism groups re-viewed the 12 scenarios shown in phase I.

As this was an exploratory analysis the groups were compared using the non-parametric Wilcoxon Signed Ranks test. The results reported a significant difference in

the AI group post-training ($z = -2.52, p = .05$), though there was no significant difference in the AC group ($z = 0, p = ns$). In the AI group all of the participants increased their scores, whereas in the AC group only one participant increased their score while two participants decreased their score and three remained the same.

A Wilcoxon Signed Ranks test indicated that scores in the AI group had significantly increased on both the trained and untrained scenarios, Trained scenarios ($z = -2.207, p = .027$), Untrained scenarios ($z = -2.032, p = .042$). This suggests that the skills were transferring to new scenarios rather than being rote learnt. Table 3 reports the raw scores from Phase I + II for the AI and AC group as well as the individual AI group scores on both trained and untrained scenarios.

The final exploratory analysis assessed whether the AI group achieved similar scores in Phase II as either the MR or ND group achieved in Phase I. Two independent sample t-tests were analysed to assess for change. Results demonstrated no significant difference between the AI group and the MR group ($t(13) = 1.12, p = .28$), or the AI group and ND group ($t(8) = 2.34, p < .05$).

In hindsight, the data collection procedure might have influenced the results. Participants were moved onto the next scenario if they incorrectly identified the 'inappropriate' actor, and were therefore not given an opportunity to gain points for naming inappropriate social skills. Therefore the participant's responses were re-scored to exclude the points gained for the identification of each inappropriate social skill. Participants could score 1 point for identifying whether it was a good or poor interaction and 1 point for correctly identifying the 'inappropriate' actor. The re-analysis reported the same pattern of results i.e. the ASD group scored significantly lower than the MR and ND group, and the MR group scored significantly lower than the ND group. The

post-training scores also remained significant, with a significant difference between the AI and AC group. The AI group scores significantly improved on both trained and untrained items.

Discussion

The results supported the four experimental predictions: (1) Individuals with autism were less able to identify appropriate and inappropriate social behaviours than the MR and ND groups. Furthermore, individuals with MR performed less well than the ND group. (2) Within the ASD group there was a negative relationship between the severity of autism and ability to identify appropriate and inappropriate social behaviour. (3) Following training, all of the AI group increased their scores, and the results demonstrated a significant improvement. Conversely, the untrained AC group's scores did not improve. (4) Furthermore the AI scores significantly improved on both the trained scenarios and the untrained scenarios. The results suggest that training with the DVD facilitated identification of appropriate and inappropriate social behaviour for individuals with autism, which generalised to new scenarios.

Prediction 1

A wealth of literature suggests that individuals with autism are more likely to make social misjudgements than typically developing peers (Baron-Cohen, O'Riordan, Stone, Jones, & Plaisted, 1999; Loveland, Pearson, Tunali-Kotoski, Ortegon & Gibbs, 2001; Pierce et al., 1997), and the present study supports this finding. The results demonstrate that individuals with autism find it extremely difficult to read both verbal and nonverbal cues in social behaviour.

The MR group was less able to identify appropriate and inappropriate social scenarios than the ND group. There are a number of possible reasons for this; Firstly it

could be a simple reflection of their lower IQ. Secondly it could be due to the fact that they have fewer learning opportunities (social situations) because they attend special educational schools – and therefore are not exposed to ‘typically’ developing teenage interactions. Thirdly, the MR group scored higher on the ABC than the ND group; this finding is unsurprising considering that individuals with autism often have a learning disability as well. Therefore, although individually the MR group did not have high enough scores to fall within the autism range, the mild strand of autistic symptomatology may have affected their performance.

Prediction 2

Research has shown that individuals who present with more severe autistic symptomatology are likely to perform worse in social conditions (Burack & Volkmar, 1992) the present study supports this finding. From this study it would appear that a high IQ does not compensate for multiple autistic symptoms.

Prediction 3

Computer-based training has shown promising results, in both engaging and teaching new skills to individuals with autism (Bernard-Opitz et al., 1990; Heimann et al., 1995; Moore & Calvert, 2000). The present study contributes to the sparse evidence base that suggests social skills can be taught successfully through this medium. On an observational level, most of the participants within the autism groups were extremely attentive throughout Phase I and Phase II. On several occasions the participants enquired about the making of the DVD and asked whether they could advance the scenarios on the computer for the experimenter. Conversely, many of the individuals in the MR and ND groups appeared to become bored near the end of the assessment process.

Prediction 4

Several studies have reported difficulty with the generalisation of newly acquired skills within this population (Schreibman, 2000; Hadwin, Baron-Cohen, Howlin & Hill, 1997; McGregor, Whiten & Blackburn, 1998), which questions whether individuals with ASD learn the 'task not the ability' (Chin & Bernard-Opitz, 2000). The present study specifically assessed whether the trained skills could be transferred to new scenarios, and reported that the skills could be generalised. Had this not been the case, the results could simply have been attributable to either rote learning or practice effects.

However, caution has to be exercised when generalising results. Firstly, this is a small sample size, and therefore any changes seen cannot be generalised to the larger autistic population. Secondly, this training only focused on training individuals with an IQ within normal range, which only makes up a small proportion of individuals with ASD. Thirdly, the study did not assess whether any of the acquired skills transferred to 'real life' situations, and therefore no prediction could be made about the effectiveness of the training for this purpose.

Future Directions

Due to the sparse evidence base, this study has a number of directions for further work. Clearly a larger sample size would be beneficial to substantiate the current findings. The inclusion of the AC group results to the present study will go some way to addressing this. However, the initial scores on Phase I were higher for the AI group than the AC group, in addition the overall ABC score was higher with six participants in the AC group than with eight participants in the AI group. Therefore it is difficult to predict whether the results will be positive due to more scope for improvement, or whether they

will further support the previous prediction, that is, the more severe the autism, the less able they are in social conditions even after training.

As previously mentioned, many of the participants in the autism groups were eager to try and control the computer to select the scenarios. An interactive social skills package would therefore be a natural progression. It would seem from this study that individuals with autism might attend for longer and learn more if they are actively involved with the study. Research is beginning to address this (Baron-Cohen, 2003; Parsons & Mitchell, 2002) but more research needs to be conducted to assess the efficacy of this type of approach.

The present study (and indeed many other computer-based studies) did not assess whether the acquired skills generalised from the computer to real-life settings. Future studies would benefit from understanding whether this transfer does take place. If it does not, future work should concentrate on establishing a means to facilitate the transfer of these skills from computer-based programs to real-life settings.

Table 1Mean Performance Scores for each group in Phase I

Group	Mean score (SD)
Autism Group	22.71 (11.32)
Non Disabled Group	45.70 (1.57)
Mild Learning Disabled Group	39.50 (4.63)

Table 2Mean Performance Scores for each group in Phase I when controlling for gender

Group	Mean score (SD)
Autism Group	22.94 (2.20)
Non Disabled Group	45.35 (2.65)
Mild Learning Disabilities Group	39.55 (2.85)

Table 3
Individual Performance Scores for the Autism Groups on Phase I + Phase II.

	Phase I Scores	Phase II Scores	Diff.	Total Pre- training scores on trained scenarios	Total Post- training scores on trained scenarios	Diff.	Total Pre- training scores on untrained scenarios	Total Post- training scores on untrained scenarios	Diff.
Trained Autism Gp									
Participant 1	31	40	+9	14	21	+7	17	19	+2
Participant 2	31	45	+14	16	24	+8	15	21	+6
Participant 3	33	44	+11	15	22	+7	18	22	+4
Participant 4	33	45	+12	14	22	+8	19	23	+4
Participant 5	18	38	+20	13	23	+10	5	15	+10
Participant 6	10	34	+24	4	18	+14	6	16	+10
Participant 7	40	46	+6	22	24	+2	18	22	+4
Participant 8	24	44	+20	15	23	+8	9	21	+12
Group Mean (SD)	27.50 (9.64)	42.00 (4.24)							
Untrained Autism Gp									
Participant 1	1	8	+7						
Participant 2	10	10	0						
Participant 3	11	7	-4						
Participant 4	21	21	0						
Participant 5	25	24	-1						
Participant 6	30	30	0						
Group mean (SD)	16.33 (10.84)	16.67 (9.63)							

References

- Attwood, T. (1998). Asperger syndrome: A guide for parents and professional. London: Jessica Kingsley Publishers.
- Baker, M.J. (2000). Incorporating the thematic ritualistic behaviors of children with autism into games: Increasing social play interactions with siblings. Journal of Positive Behavior Interventions, 2, 66-84.
- Baker, M.J., Koegel, R.L., & Koegel, L.K. (1998). Increasing the social behavior of young children with autism using their obsessive behaviours. Journal of the Association for Persons with Severe Handicaps, 23(4), 300-308.
- Baron-Cohen, S. (2003). Mind Reading: The Interactive Guide to Emotion (online). Available: .
- Baron-Cohen, S., Leslie, A.M., & Frith, U (1985). Does the autistic child have a "Theory of Mind"? Cognition, 21(1), 37-46.
- Baron-Cohen, S., O'Riordan, M., Stone, V., Jones, R., & Plaisted, K. (1999). Recognition of faux pas by normally developing children with Asperger syndrome or high functioning autism. Journal of Autism and Developmental Disorders, 29(5), 407-418.

Belchic, J.R., & Harris, S.L. (1994). The use of multiple peer exemplars to enhance the generalization of play skills to the siblings of children with autism. Child & Family Behavior Therapy, 16, 1-25.

Bernard-Opitz, V., Ross, K. & Tutas, M.L. (1990) Computer assisted instruction for autistic children. Ann Acad Med Singapore, 19(5), 611-616.

Bernard-Opitz, V., Sriram, N., & Nakhoda-Sapuan, S. (2001). Enhancing social problem solving in children with autism and normal children through computer-assisted instruction. Journal of Autism and Developmental Disorders, 31 (4), 377-384.

Burack, J.A., & Volkmar, F.R. (1992). Development of low- and high-functioning autistic children. Journal of Child Psychology and Psychiatry and Allied Disciplines, 33(3), 607-616.

Chin, H.Y., & Bernard-Opitz, V. (2000). Teaching conversation skills to children with autism: Effect on the development of a theory of mind. Journal of Autism & Developmental Disorders, Vol 30(6), 569-583.

Davis, C.A., Brady, M.P., Hamilton, R., & McEvoy, M.A. (1994). Effects of high-probability requests on the social interactions of young children with severe disabilities. Journal of Applied Behavior Analysis, 27, 619-637.

Dawson, G., & Galpert, L. (1990). Mothers' uses of imitative play for facilitating social responsiveness and toy playing in young autistic children. Development and Psychopathology, 2, 151-162.

Dugan, E.P., Kamps, D.M., Leonard, B.R., Watkins, N., Rheinberger, A., & Stackhaus, J. (1995). Effects of cooperative learning groups during social studies for students with autism and fourth grade peers. Journal of Applied Behavioral Analysis, 28, 175-188.

Frith, U., & Happe, F. (1994). Autism: Beyond "Theory of Mind". Cognition, 50(1-3), 115-132.

Goldstein, H., Kaczmarek, L., Pennington, R., & Shafer, K. (1992) Peer-mediated intervention: Attending to, commenting on, and acknowledging the behavior of preschoolers with autism. Journal of Applied Behavior Analysis, 25, 289-305.

Hadwin, J.A., Baron-Cohen, S., Howlin, P., & Hill, K. (1997). Does teaching theory of mind have an effect on the ability to develop conversation in children with autism? Journal of Autism and Developmental Disorders, 27, 519-537.

Heiman, M., Nelson, K. E., Tjus, T., & Gillberg, C. (1995). Increasing reading and communication skills in children with autism through an interactive multimedia program. Journal of Autism and Developmental Disorders, 25, 459-480.

Howlin, P. (1997). Autism: Preparing for adulthood. Routledge: London.

Jones, R.S.P., & Zahl, A., & Huws, J. (2001). A qualitative analysis of first-hand accounts of emotional experiences in Autism. Disability and Society, 16, 3, 393-401.

Kamps, D.M., Barbetta, P.M., Leonard, B.R., & Delquadri, J. (1994). Classwide peer tutoring: An integration strategy to improve reading skills and promote peer interactions among students with autism and general education peers. Journal of Applied Behavior Analysis, 27, 49-61.

Kamps, D.M., Leonard, B.R., Vernon, S., Dugan, E.P., & Delquadri, J.C. (1992). Teaching social skills to students with autism to increase peer interactions in an integrated first-grade classroom. Journal of Applied Behavior Analysis, 25, 281-288.

Kanner, L. (1943). Autistic disturbances of affective contact. Nervous Child, 2, 217-250.

Koegel, L.K., Koegel, R.L., Hurley, C., & Frea, W.D. (1992) Improving social skills and disruptive behavior in children with autism through self-management. Journal of Applied Behavioral Analysis, 25, 341-353.

Kohler, F.W., Anthony, L.J., Steighner, S.A., & Hoyson, M. (2001) Teaching social interaction skills in the integrated preschool: An examination of naturalistic tactics. Topics in Early Childhood Special Edition, Vol 21(2), 93-103.

Krug, D.A., Arick, J., & Almond, P. (1980). Behavior checklist for identifying severely handicapped individuals with high levels of autistic behavior. Journal of Child Psychology & Psychiatry & Allied Disciplines, 21(3), 221-229.

Loveland, K.A., Pearson, D.A., Tunali-Kotoski, B., Ortegon, J., & Gibbs, M. C. (2001). Judgements of social appropriateness by children and adolescents with autism. Journal of Autism and Developmental Disorders, 31 (4), 367-376.

McGee, G.G., Morrier, M.J., & Daley, T. (1999). An incidental teaching approach to early intervention for toddlers with autism. Journal of the Association for Persons with Severe Handicaps, 24, 133-146.

McGregor, E., Whiten, A., & Blackburn, P.(1998). Transfer of the 'picture-in-the-head' analogy to natural contexts to aid false belief understanding in autism. Autism, 2, 367-387.

Moore, M., & Calvert, S. (2000). Brief report: Vocabulary acquisition for children with autism: Teacher or computer instruction. Journal of Autism and Developmental Disorders, 30 (4), 359-362.

Odom, S.L., Hoyson, M., Jamieson, B., & Strain, P.S. (1985). Increasing handicapped preschoolers' peer social interactions: Cross-setting and component analysis. Journal of Applied Behavior Analysis, 18, 3-16.

Odom, S.L., McConnell, S.R., McEvoy, M.A., Peterson, C., Ostrsky, M., Chandler, L.K., Spicuzza, R.J., Skellenger, A., Creighton, M., & Favazza, P.C. (1999). Relative effects of interventions for supporting the social competence of young children with disabilities. Topics in Early Childhood Special Education, 19, 75-92.

Odom, S.L., & Strain, P.S. (1986). A comparison of peer-initiation and teacher-antecedent interventions for promoting reciprocal social interaction of autistic preschoolers. Journal of Applied Behavior Analysis, 19, 59-71.

Ozonoff, S., & Miller, J.N. (1995). Teaching theory of mind: A new approach to social skills training for individuals with autism. Journal of Autism and Developmental Disorders, 25, 415-433.

Ozonoff, S., Pennington, B.F., & Rogers, S.J. (1991). Executive function deficits in High-functioning autistic individuals: Relationship to theory of mind. The Journal of Child Psychology and Psychiatry and Allied Disciplines, 32(7), 1081-1105.

Parsons, S., & Mitchell, P. (2002). The potential of virtual reality in social skills training for people with autistic spectrum disorders. Journal of Intellectual Disability Research, 46 (5), 430-443.

Pierce, K., Glad, K.S., & Schreibman, L. (1997). Social perception in children with autism: An attention deficit? Journal of Autism and Developmental Disorders, 27, 265-282.

Rogers, S.J., Herbison, J., Lewis, H., Pantone, J., & Reis, K. (1986). An approach for enhancing the symbolic, communicative, and interpersonal functioning of young children with autism and severe emotional handicaps. Journal of the Division of Early Childhood, 10, 135-148.

Shreibman, L. (2000). Intensive behavioural/psychoeducational treatments for autism: Research needs and future directions. Journal of Autism and Developmental Disorders. Special Issue: Treatments for people with autism and other pervasive developmental disorders: Research perspectives, 30, 373-378.

Sevin, J.A., Matson, J.L., Coe, D.A., Fee, V.E., & Sevin, B.M. (1991). A comparison and evaluation of three commonly used autism scales. Journal of Autism and Developmental Disorders, 21, 417-432.

Sigman, M., & Ruskin, E. (1999). Continuity and change in the social competence of children with autism, Down syndrome, and developmental delays. Monographs of Society for Research in Child Development, 64, 1-130.

Swettenham, J.G. (1996). Can children with autism be taught to understand false belief using computers? Journal of Child Psychology and Psychiatry, 37, 157-165.

The Psychological Corporation. (1999). Wechsler Abbreviated Scale of Intelligence. Harcourt Brace & Company: San Antonio.

Volkmar, F.R., Cicchetti, D.V., Dykens, E., Sparrow, S.S., Leckman, J.F., & Cohen, D.J. (1988). An evaluation of the Autism Behavior Checklist. Journal of Autism and Developmental Disorders, 18(1), 81-97.

Vostanis, P., Smith, B., Corbett, J., Sungum-Paliwal, R., Edwards, A., Gingell, K., Golding, R., Moore, A., & Williams, J. (1998). Parental concerns of early development in children with autism and related disorders. Autism, 2, 229-242.

Wadden, N.P., Bryson, S.E., & Rodger, R.S. (1991). A closer look at the Autism Behavior Checklist: Discriminant validity and factor structure. Journal of Autism and Developmental Disorders, 21, 529-541.

Wing, L., & Gould, J. (1979). Severe impairments of social interaction and associated abnormalities in children: epidemiology and classification. Journal of Autism and Developmental Disorders, 9, pp 11-29.

Appendices

Appendix 3.1 – Authors notes

Appendix 3.1 – Authors notes for: Journal of Autism and Developmental Disorders

Selected journal for submission: Journal of Autism and Developmental Disorders

- **Notes for Authors**

1. Manuscripts should be submitted to the Editor:

Gary B. Mesibov
Division TEACCH
100 Renee Lynn Drive
Carrboro, NC 27510

Please direct all inquiries concerning manuscripts to Kathie Barron at (919) 966-8182.

2. Submission is a representation that the manuscript has not been published previously and is not currently under consideration for publication elsewhere. A statement transferring copyright from the authors (or their employers, if they hold the copyright) to Plenum Publishing Corporation will be required before the manuscript can be accepted for publication. The Editor will supply the necessary forms for this transfer. Such a written transfer of copyright, which previously was assumed to be implicit in the act of submitting a manuscript, is necessary under the U.S. Copyright Law in order for the publisher to carry through the dissemination of research results and reviews as widely and effectively as possible.
3. Type double-spaced, and submit the original and three copies (including copies of all illustrations and tables). Academic affiliations of all authors and the full mailing address of the one author who will review the proofs should be included. Unless a self-addressed stamped envelope is enclosed, manuscripts can not be returned.
4. A 120-word abstract is to be provided
5. Tables should be numbered and referred to by number in the text. Each table should be typed on a separate sheet of paper and should have a descriptive title.
6. Illustrations (photographs, drawings, diagrams, and charts) are to be numbered in one consecutive series of Arabic numerals. Photographs should be large, glossy prints, showing high contrast. Drawings should be prepared with India ink. Either the original drawings or good-quality photographic prints are acceptable. Identify figures on the back with author's name and number of the illustration. Each figure should have an accompanying caption. The list of captions for illustrations should be typed on a separate sheet of paper. Electronic artwork submitted on disk should be in TIFF or EPS format (1200 dpi for line and 300 for half-tones and gray-scale art). Color art should be in the CYMK color space. Artwork should be on a separate disk from the text, and hard copy *must* accompany the disk.

7. The 1994 fourth edition of the *Publication Manual* of the American Psychological Association should be used as the style guide for the preparation of manuscripts, particularly with respect to such matters as the citing of references and the use of abbreviations, numbers and symbols. We will be unable to review manuscripts that are not prepared according to these guidelines.
8. After a manuscript has been accepted for publication and after all revisions have been incorporated, manuscripts should be submitted to the Editor's Office as hard copy accompanied by electronic files on disk. Label the disk with identifying information – software, journal name, and first author's last name. **The disk *must* be the one from which the accompanying manuscript (finalized version) was printed out.** The Editor's Office cannot accept a disk without its accompanying, matching hard-copy manuscript.
9. **The journal makes no page charges.** Reprints are available to authors, and order forms with the current price schedule are sent with proofs.

**SOCIAL SKILLS IN ADOLESCENTS WITH AUTISM:
TESTING THE SPECIFICITY OF THE DEFICIT, AND
DEVELOPMENT OF A DVD TRAINING INTERVENTION**

A Critical Review of the Study.

Katie Haddock

*Department of Clinical Psychology, University of Wales, Bangor,
Gwynedd, LL57 2DG*

Background

The study developed from the researcher's interest in working with autistic spectrum disorder (ASD), and fascination in how to support this population with the essential but intricate skill of social competency. As individuals with ASD are so limited by their inability to understand and display appropriate social skills, the researcher wanted to contribute to and advance the evidence base on social skills training with this population.

To establish the design for the current study, the existing evidence base was examined. From a behavioural perspective it seemed interesting that adults and peers were delivering the social skills training packages, even though it has commonly been accepted that human contact is not reinforcing for this particular population. The outcome data that reported a loss of acquired skills after the removal of the reinforcer or training (Koegel et al., 1992; Odom et al., 1985; Odom & Strain, 1986) was therefore relatively unsurprising. It appeared logical that the replacement of the social stimuli with more reinforcing stimuli (i.e. mechanical devices - computers, videos) could further motivate and facilitate the learning of these skills within this population. With this in mind, the researcher considered the use of either video or computer-based training. As individuals with ASD have reportedly felt comfortable interacting on a social level on the e-mail system (Jones et al., 2001), the use of a computer based training package with DVD scenarios was considered potentially the most effective training method.

This decision was supported by the empirical evidence, which suggested that computer-based packages have been an effective training method for a number of skills with individuals with ASD (Bernard-Opitz et al., 1990; Heimann et al., 1995; Moore & Calvert, 2000). Yet within the social skills arena, the development of these packages has

been relatively slow. Therefore as the evidence base for computer-based social skills training packages was so sparse, and the potential social skill areas to target so vast, the researcher decided to focus on a basic skill of social competency – identification of appropriate and inappropriate social behaviour.

Having targeted the specific social skill to be assessed and trained, the next stage was to find or create a computer-based training package. Following examination of available resources it became increasingly apparent that a DVD would have to be tailor-made for this study.

Preparation for research

The preparation and creation of the DVD required a significant amount of time and planning. Prior to the enrolment of the actors, the array of social skills that could potentially be manipulated had to be identified. However, the final decision on the specific social skills, the locations and verbal content of the scenarios emerged through the sessions with the actors.

Eight drama students aged between 15 and 17 were enrolled, to ensure that the DVD included ‘peer appropriate’ interactions and conversations. Three months prior to filming, the actors met on a weekly basis for two hours. During these sessions they improvised ‘everyday’ teenage conversations in a variety of settings. During the initial sessions, the actors had the freedom to choose both the topics and locations for the improvisations. Throughout this process the researcher recorded the conversational themes, ‘typical’ social locations and body language displayed by the actors.

As the sessions progressed the five social skill areas were established. However, this task was particularly difficult, as it became increasingly obvious that the nuances of social skills are difficult to identify by a socially competent individual! The actors were

actively involved in establishing the locations for the scenes, they agreed on the café for peer interactions and the clothes shop for teenage-adult interactions. After the social skills were identified the actors spent time rehearsing their roles, and were directed by the researcher on effect and ineffective portrayals of social skills.

Following the improvisation sessions the storyboard was constructed. The storyboard reported the location of the scenario (i.e. café or clothes shop) and the social skills to be manipulated. Originally, the storyboard outlined three social skill areas to be manipulated, however following the evaluation by the expert panel one scenario was reported to include four inappropriate social skills. Through editing, 20 scenarios were stored on the DVD, 12 were utilised in Phase I and eight were stored for training purposes.

The Expert Panel

The expert panel validated the DVD and established the scoring system. Some scenarios generated debate, and highlighted the difficulty in quantifying social behaviour. Few disagreements occurred when establishing whether the interaction was 'good' or 'poor'. However, on occasion some of the inappropriate social skills were subtler, and these caused greater debates. Interestingly, the latter task highlighted the variability among individuals in what they perceive to be 'acceptable' social behaviour. Such differences in perception not only establish why it is difficult to teach social skills, but why individuals with autism may find it difficult to understand the social rules.

Method

Recruitment of participants

The recruitment process was time consuming as the research had to initially be approved by the head teacher and subsequently by all of the other teachers involved.

Every teacher was offered the opportunity to view the DVD scenarios to ensure that they would be equipped to discuss the research with parents if required. Therefore before the parents were even approached, a substantial amount of preparatory work had already been done. Following consent from parents, the adolescents could be approached. Time restrictions were also imposed on this process; firstly, because every consent procedure and many assessment procedures needed to be organised with a teacher/parent present, secondly, all assessment and training procedures were conducted during school time, therefore each session was structured around lesson and break times.

Also, within the mental retardation (MR) and autism (ASD) groups, the inclusion criteria restricted the amount of potential participants. The inclusion criteria for the MR group included the IQ range between 50 and 70. Data collection was delayed as initially the teachers selected participants who had IQ's above 70 and therefore had to be excluded from the study. Within the autism groups, the individuals had to have an IQ of 70 or above, and as this population only account for a small percentage of the overall autistic spectrum population, the availability of participants was limited. When initially suggesting participants, the teachers reported this population to be higher functioning than they were, and the researcher assessed a number of participants who had an IQ below 70 and could not, therefore, proceed further with the study. In addition, any individual who had received formal social skills training could not participate in the study.

Consent

Some parents telephoned the researcher to discuss the research further before signing the consent form. Following the phone calls, all parents reported that they had been fully informed about the study and were willing to sign the consent form. If any of

the parental consent forms were returned signed, but with an indication that the parent had not felt fully informed about the study in any way – the researcher telephoned them before proceeding.

While collecting consent from parents, one parent raised concerns regarding the possibility of the research giving his child with autism a heightened awareness of his social impairment. The parent was concerned about the impact of the DVD on the child's self-esteem. Through discussions with the researcher the parent was satisfied that the training package would sensitively build on the participants strengths rather than highlight his deficits. However, the parent raised an important concern. Issues of self-esteem and confidence should be paramount when training a complex and intricate like social competency. Social skills training packages need to ensure that the individual does not feel that they have failed before they start.

The issue of consent was dealt with carefully with each participant. All of the participants in the ASD or MR groups were offered the choice of either reading the information sheet themselves or the researcher/parent/teacher reading it with them. This process often took at least 15-20 minutes to ensure that informed consent was being obtained. The parents/teachers reported on the ability of each participant to give informed consent, all participants within the study expressed no difficulties with understanding the consent form. The study was thoroughly discussed with the participant until the researcher and witness to consent were satisfied that the participant was giving informed consent.

Confidentiality

Each individual was informed that their data would be coded and that only the researcher and supervisor would know their identities. All of the participants felt

comfortable with this arrangement and observed the researcher writing their personal code on all of their scoring forms.

Design

As a pilot study, the research employed a between group design to explore whether lack of social experience (controlled by the MR group) or IQ without social impairment (controlled by the ND group) could impact on the participants ability to understand appropriate and inappropriate social behaviour. Obviously for this study the groups included were far from exhaustive, but the pilot study aimed to take the first step in understanding which factors impact on performance.

Measures

Wechsler Abbreviated Scale of Intelligence

The Wechsler Abbreviated Scale of Intelligence (WASI; The Psychological Corporation, 1999) was used as a screening assessment for IQ. The length of the abbreviated version was more appropriate for the MR and ASD groups than a longer IQ assessment. However, as the assessment was completed before the DVD scenarios a few of the participants questioned whether they were being 'tested'. It would have been preferable to complete the scenarios before the WASI, as the scenarios were less threatening – but naturally the screening assessment had to be administered first. The administration of the two sub-scales rather than the four was considered, but to ensure a more robust IQ test, the four subscales were deemed to be more appropriate.

Modified version of the Autism Behavior Checklist

The parents/ guardians of the participants scored the modified version of the Autism Behaviour Checklist (ABC; Volkmar, Cicchetti, Dykens, Sparrow, Leckman, & Cohen, 1988) as a screening for autism. The questionnaire was included in the parental information pack and in hindsight the researcher would have excluded the name of the questionnaire before distribution. The title may have concerned parents of children without disabilities or with a learning disability.

DVD scenarios

As a new assessment and training tool, the expert panel validated the DVD scenarios. One of the most striking features of this research was the immense interest that the individuals with autism had with both the computer and the DVD. The majority of participants within the ASD group asked how the DVD was made, and most were fixated to the screen throughout the Phase I and Phase II. Many were interested in working the computer and frequently asked the researcher if they could find the next scenario on the computer. It became apparent that one of the main strengths of this study was the motivating factor of the computer/DVD. It is often difficult to maintain engagement in this clinical population and the use of computer-based teaching clearly demonstrated the value of such a learning vehicle.

The DVD scenarios lasted approximately 25 minutes in total. On an observational level both the ND and MR groups were beginning to show signs of boredom towards the end of the session. Yet the individuals with autism did not seem to bore as quickly, even though they viewed the scenarios on more occasions than the other groups.

DVD scenarios throughout training

Within the training group it was interesting to note that when informed of the social skills that had been manipulated many of the participants could discuss why it was inappropriate to behave that way. For example one participant was reporting that the actor was giving too little eye contact, which was 'very rude'. However, throughout the conversation the participant was looking around the room and did not at any stage make eye contact with the researcher.

Whilst training the researcher became aware that many social skills are established from an early age and are therefore conducted naturally. It was difficult to break down the nuances and rules of social skills when training the participants. For example, how do we know when somebody's eye contact is too intense? It is not timed but we naturally know to look away after a few seconds. When discussing these skills with the training group, they appeared to know the rules but could or would not use them.

Many of the participants also became extremely involved in the content of the conversations and the reasons behind the scenario i.e. when in the clothes shop, the majority became irritated by the fact that the actor was not being clear about the type of clothes they wanted. Many of the participants missed the other social skill deficits because they were so preoccupied with the actors deviation from the 'rules' when clothes shopping. After training, many improved their score by re-focussing on both the verbal and nonverbal cues.

Along a similar vein, many of the participants became distracted if they felt that the actor was being verbally inappropriate i.e. if they were being rude about a teacher or if they hadn't done their homework. One scenario in particular caused great concern as

the actor reported that the teacher was 'an idiot and doesn't like me'. Many of the individuals with ASD reported that this was the only inappropriate behaviour in the scenario even though one of the actors was also flapping her hands and changing the subject continuously.

General limitations

Methodological problems such as small sample sizes are frequently reported in social skills training packages and this study was no exception. However, this will hopefully be addressed on completion of Phase II with the waiting-list control group. On completion, the study will have collectively evaluated the efficacy of the DVD with 14 participants. The inclusion of these data will go some way to determining how successful the DVD is as a training tool.

The study design changed from a randomised control trial to a class wide intervention. Naturally, there are implications with this change. The training group consisted of a higher IQ group who were being integrated into mainstream schooling, and were therefore being exposed to more mainstream peer interactions than the waiting-list control group. Also, the training group had the opportunity to discuss the study amongst themselves unlike the waiting-list control group who were based on two different sites. Ethically the change of design was not problematic, as it was outlined from the outset that each participant would receive the training at some stage.

Process issues

Due to the nature of ASD it was important for the researcher to give a very clear explanation of what the research involved. Much time was spent thinking about phrasing of the explanation about the research, and the questions on the scoring sheet, to ensure that the participants could make a literal translation of what was being said rather than

rely on inference – which is often difficult for this population. Therefore the scoring sheet explained that the participants were looking for problems with ‘body language and conversations i.e. making too much/little eye contact or standing too close or changing the subject’.

Future Research

Individuals with ASD have complex social skills deficits. The current research only assesses whether this client group can identify and label inappropriate social skills. A further development of the present study would be to establish whether the acquired skills from training could generalise to ‘real life’ situations and more importantly adapt their own behaviour to comply with the social rules. How to assess and orchestrate the shift from identification to practice could potentially be the focus for many future projects.

A further development of this research would be to include individuals with both a learning disability and autism to establish whether the training would also benefit this group. In keeping with criticism of previous research in this area, this study will endeavour to reassess the training participants in six months time to identify whether the skills have been maintained.

The teachers in the current study were keen to maintain the skills that the participants have acquired through this study and expressed an interest in continuing the teaching themselves on a weekly basis for six months. The skills acquired would then be re-evaluated by the researchers. As the DVD is easy to administer, many studies could be conducted with the teachers as researchers.

References

Bernard-Opitz, V., Ross, K. & Tutas, M.L. (1990) Computer assisted instruction for autistic children. Ann Acad Med Singapore, 19(5), 611-616.

Heimann, M., Nelson, K. E., Tjus, T., & Gillberg, C. (1995). Increasing reading and communication skills in children with autism through an interactive multimedia program. Journal of Autism and Developmental Disorders, 25, 459-480.

Jones, R.S.P., & Zahl, A., & Huws, J. (2001). A qualitative analysis of first-hand accounts of emotional experiences in Autism. Disability and Society, 16, 3, 393-401.

Koegel, L.K., Koegel, R.L., Hurley, C., & Frea, W.D. (1992) Improving social skills and disruptive behavior in children with autism through self-management. Journal of Applied Behavioral Analysis, 25, 341-353.

Moore, M., & Calvert, S. (2000). Brief report: Vocabulary acquisition for children with autism: Teacher or computer instruction. Journal of Autism and Developmental Disorders, 30 (4), 359-362.

Odom, S.L., Hoyson, M., Jamieson, B., & Strain, P.S. (1985). Increasing handicapped preschoolers' peer social interactions: Cross-setting and component analysis. Journal of Applied Behavior Analysis, 18, 3-16.

Odom, S.L., & Strain, P.S. (1986). A comparison of peer-initiation and teacher-antecedent interventions for promoting reciprocal social interaction of autistic preschoolers. Journal of Applied Behavior Analysis, 19, 59-71.

The Psychological Corporation. (1999). Wechsler Abbreviated Scale of Intelligence. Harcourt Brace & Company: San Antonio.

Volkmar, F.R., Cicchetti, D.V., Dykens, E., Sparrow, S.S., Leckman, J.F., & Cohen, D.J. (1988). An evaluation of the Autism Behavior Checklist. Journal of Autism and Developmental Disorders, 18(1), 81-97.

General Appendices

Appendix 4.1 – Statement of word count

Statement of Word Count

Thesis Component	Words
Title	19
Main Abstract (summary)	300
Ethics Proposal	4228
Literature Review	5639
Research Paper	4307
Critical Review	2760
Total	17253
Components of Appendices	Words
Contents Section (excluding abstract)	654
Tables (section 3)	252
<i>References:</i>	
Literature Review	2557
Research Paper	1261
Critical Review	323
Appendix 1	8765
Appendix 2	1074
Appendix 3	533
Total	15419